# A reconstruction of Bürgi's sine table at 1' intervals (ca. 1587) 

Denis Roegel

## To cite this version:

Denis Roegel. A reconstruction of Bürgi's sine table at 1 ' intervals (ca. 1587). 2016. hal-01316359

## HAL Id: hal-01316359 <br> https://inria.hal.science/hal-01316359

Preprint submitted on 16 May 2016

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire HAL, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

## A reconstruction of

# Bürgi's sine table at $\mathbf{1}^{\prime}$ intervals <br> (ca. 1587) 

Denis Roegel

## 2016

(last version: 26 march 2016)

This document gives a reconstruction of the sine table contained in Jost Bürgi's Fundamentum Astronomice, a manuscript recently discovered by Menso Folkerts [3, 4] and edited by Dieter Launert [5].

This table gives the sines for every minute of the quadrant, to 5 sexagesimal places between $0^{\circ}$ and $88^{\circ}$, and to 6 and 7 sexagesimal places for the last two degrees. The sexagesimal values are given such that the sinus totus is equal to 60 . The last value of the table is therefore $60,0,0,0,0,0,0$, corresponding to the sine of $90^{\circ}$. The sine of the first minute is $0,1,2,49,55$, corresponding to the modern value $((((55 / 60+49) / 60+2) / 60+$ 1) $/ 60+0) / 60=0.000290888 \ldots$

Given a modern value of the sine, we can easily obtain its sexagesimal digits by multiplying repeatedly by 60 and taking the fractional parts. The integer parts are the sexagesimal digits. For instance, if we start with $\sin 1^{\prime}$, we have

$$
\begin{align*}
\sin 1^{\prime} & =0.00029088820456 \ldots  \tag{1}\\
60 \sin 1^{\prime} & =0.01745329227380 \ldots  \tag{2}\\
& \rightarrow \quad d_{0}=0 \\
\left(60 \sin 1^{\prime}-d_{0}\right) \times 60= & 1.04719753642832 \ldots  \tag{3}\\
& \rightarrow \quad d_{1}=1 \\
\left(\left(60 \sin 1^{\prime}-d_{0}\right) \times 60-d_{1}\right) \times 60= & 2.83185218569971 \ldots  \tag{4}\\
& \rightarrow \quad d_{2}=2 \\
\left(\left(\left(60 \sin 1^{\prime}-d_{0}\right) \times 60-d_{1}\right) \times 60-d_{2}\right) \times 60 & =49.91113114198276 \ldots \tag{5}
\end{align*}
$$

$$
\rightarrow \quad d_{3}=49
$$

$$
\begin{equation*}
\left(\left(\left(\left(60 \sin 1^{\prime}-d_{0}\right) \times 60-d_{1}\right) \times 60-d_{2}\right) \times 60-d_{3}\right) \times 60=54.66786851896614 \ldots \tag{6}
\end{equation*}
$$

$$
\rightarrow \quad d_{4}=54
$$

and we see that the sexagesimal expression of $\sin 1^{\prime}$ is in fact $0,1,2,49,54, \ldots$. The value given by Bürgi, and also in our reconstruction, is $0,1,2,49,55$, because the last figure is rounded.

Each page of the table covers five degrees, the left hand pages give the minutes from 0 to 30 , and the right hand pages give the minutes from 30 to 60 . The differences between consecutive values are shown in red. These are the differences between the rounded values, not the rounded exact differences, of course.

A comparison between the original table ${ }^{1}$ and our reconstruction reveals that the table is very accurate. There are a few errors and typos, but apparently very few. For

[^0]instance, $\sin 4^{\circ}$ is given as $4,11,17,23,54$, instead of the correct $4,11,7,23,54$, but since the difference between $\sin 4^{\circ}$ and $\sin 4^{\circ} 1^{\prime}$ is given correctly, this is obviously a copying error. For $\sin 6^{\circ} 10^{\prime}$, Bürgi gives $6,26,42,55,41$, but the correctly rounded result is $6,26,42,55,42$, because the next figure is 30 . There may be a few similar errors, but only very few.

It is also easy to see that the computations were done to a greater number of places, but that only five places were kept. This table was computed using pivots, that is values which were computed beforehand, for instance using Bürgi's iterative algorithm, and then by applying an interpolation scheme based on the accumulation of higher differences. These techniques are described by Launert [5], as well as in several of our notes [8, 9, 10].

We have used the layout of this table to produce a tentative reconstruction [11] of Bürgi's table of sines with $2^{\prime \prime}$ intervals and 8 sexagesimal places, assuming such a table did really exist.

## References

The following list covers the most important references ${ }^{2}$ related to Bürgi's table. Not all items of this list are mentioned in the text, and the sources which have not been seen are marked so. We have added notes about the contents of the articles in certain cases.
[1] Jost Bürgi. Arithmetische und Geometrische Progress Tabulen, sambt gründlichem Unterricht, wie solche nützlich in allerley Rechnungen zugebrauchen, und verstanden werden sol. Prague, 1620. [These tables were recomputed in 2010 by D. Roegel [7]]
[2] Kathleen Clark. Jost Bürgi's Aritmetische und Geometrische Progreß Tabulen (1620). New York: Springer, 2015.
[3] Menso Folkerts. Eine bisher unbekannte Schrift von Jost Bürgi zur Trigonometrie. In Rainer Gebhardt, editor, Arithmetik, Geometrie und Algebra in der frühen Neuzeit, pages 107-114. Annaberg-Buchholz: Adam-Ries-Bund, 2014. [not seen]
[4] Menso Folkerts, Dieter Launert, and Andreas Thom. Jost Bürgi's method for calculating sines, 2015. [uploaded on arXiv on 12 October 2015, id 1510.03180v1; a preprint dated 19 September 2015 is also available online; a second version was put on arXiv on 2 February 2016]
[5] Dieter Launert. Nova Kepleriana: Bürgis Kunstweg im Fundamentum Astronomiae - Entschlüsselung seines Rätsels. München: Bayerische Akademie der Wissenschaften, 2015.
[6] Christian Riedweg. Bürgi's "Kunstweg" - geometric approach, 2016. [uploaded on arXiv on 25 February 2016]
[7] Denis Roegel. Bürgi's Progress Tabulen (1620): logarithmic tables without logarithms. Technical report, LORIA, Nancy, 2010. [This is a recalculation of the tables of [1].]
[8] Denis Roegel. Jost Bürgi's skillful computation of sines. Technical report, LORIA, Nancy, 2015.
[9] Denis Roegel. A note on the complexity of Bürgi's algorithm for the computation of sines. Technical report, LORIA, Nancy, 2016.
[10] Denis Roegel. A preliminary note on Bürgi's computation of the sine of the first minute. Technical report, LORIA, Nancy, 2016.

[^1][11] Denis Roegel. A tentative reconstruction of Bürgi's sine table at $2^{\prime \prime}$ intervals (ca. 1600). Technical report, LORIA, Nancy, 2016.

Bürgi's 1' sine table (reconstruction, D. Roegel, 2016)

| 1 | $0^{\circ}$ |  |  |  |  | $1^{\circ}$ |  |  |  |  | $2^{\circ}$ |  |  |  |  | $3^{\circ}$ |  |  |  |  | $4^{\circ}$ |  |  |  |  | , |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 0 | 0 | $\begin{aligned} & \hline 0 \\ & 1 \\ & \hline \end{aligned}$ | $\begin{aligned} & \hline 0 \\ & 2 \end{aligned}$ | $\begin{array}{r} \mathbf{o} \\ 49 \\ \hline \end{array}$ | $\begin{array}{r} \hline \mathbf{0} \\ 55 \\ \hline \end{array}$ | 1 | $2$ | $\begin{array}{r} 49 \\ 2 \end{array}$ | $\begin{array}{\|l\|} \hline 43 \\ 49 \end{array}$ | $\begin{array}{\|l\|} \hline 11 \\ 20 \end{array}$ | 2 | $5$ | $\begin{array}{r} 38 \\ 2 \end{array}$ | $\begin{array}{\|l\|} \hline \mathbf{1 7} \\ 47 \end{array}$ | $\begin{aligned} & 29 \\ & 35 \end{aligned}$ | 3 | $8$ | $\begin{array}{r} 24 \\ 2 \end{array}$ | $\begin{aligned} & 34 \\ & 44 \end{aligned}$ | $\begin{array}{r} \mathbf{o} \\ 43 \end{array}$ | 4 | $11$ | $\begin{aligned} & 7 \\ & 2 \end{aligned}$ | $\begin{aligned} & 23 \\ & 40 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 54 \\ 41 \\ \hline \end{array}$ | 0 |
| 1 |  | $\begin{aligned} & 1 \\ & 1 \end{aligned}$ | $\begin{aligned} & 2 \\ & 2 \end{aligned}$ | $\begin{aligned} & 49 \\ & 49 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 55 \\ 54 \\ \hline \end{array}$ |  | $\begin{aligned} & 3 \\ & 1 \end{aligned}$ | $\begin{array}{r} 52 \\ 2 \end{array}$ | $\begin{aligned} & \mathbf{3 2}^{2} \\ & 49 \\ & \hline \end{aligned}$ | $\begin{aligned} & \mathbf{3 1} \\ & \mathbf{1 8} \end{aligned}$ |  | $6$ | $\begin{array}{r} 41 \\ 2 \end{array}$ | $\begin{array}{r} 5 \\ 47 \\ \hline \end{array}$ | $\begin{array}{r} 4 \\ 34 \\ \hline \end{array}$ |  | $\begin{aligned} & 9 \\ & 1 \end{aligned}$ | $\begin{array}{r} 27 \\ 2 \end{array}$ | $\begin{aligned} & \hline \mathbf{1 8} \\ & 44 \\ & \hline \end{aligned}$ | $\begin{aligned} & 43 \\ & 39 \\ & \hline \end{aligned}$ |  | $12$ | $\begin{array}{r} 10 \\ \hline 2 \\ \hline \end{array}$ | $\begin{array}{r} 4 \\ 40 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 35 \\ 37 \\ \hline \end{array}$ | 1 |
| 2 |  | $2$ | $\begin{aligned} & 5 \\ & 2 \end{aligned}$ | $\begin{aligned} & 39 \\ & 49 \\ & \hline \end{aligned}$ | $\begin{gathered} 49 \\ 55 \\ \hline \end{gathered}$ |  | $\begin{aligned} & 4 \\ & 1 \end{aligned}$ | $\begin{array}{r} 55 \\ 2 \end{array}$ | $\begin{aligned} & \mathbf{2 1} \\ & 49 \end{aligned}$ | $\begin{aligned} & 49 \\ & 18 \end{aligned}$ |  | $7$ | $\begin{array}{r} 43 \\ 2 \end{array}$ | $\begin{aligned} & 52 \\ & 47 \end{aligned}$ | $\begin{aligned} & 3^{8} \\ & 3^{1} \end{aligned}$ |  | $\begin{gathered} 10 \\ 1 \end{gathered}$ | $\begin{gathered} 30 \\ 2 \end{gathered}$ | $\begin{array}{r} 3 \\ 44 \\ \hline \end{array}$ | $\begin{aligned} & 22 \\ & 36 \end{aligned}$ |  | $\begin{array}{r} 13 \\ 1 \end{array}$ | $\begin{array}{r} 12 \\ 2 \end{array}$ | $\begin{aligned} & 45 \\ & 40 \\ & \hline \end{aligned}$ | $\begin{aligned} & 12 \\ & 32 \end{aligned}$ | 2 |
| 3 |  | $\begin{aligned} & \mathbf{3} \\ & \mathbf{1} \end{aligned}$ | $\begin{aligned} & 8 \\ & 2 \end{aligned}$ | $\begin{aligned} & 29 \\ & 49 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 44 \\ 54 \\ \hline \end{array}$ |  | $5$ | $\begin{array}{r} 58 \\ 2 \end{array}$ | $\begin{array}{\|l\|} \mathbf{1 1} \\ 49 \\ \hline \end{array}$ | $\begin{array}{r} 7 \\ 16 \end{array}$ |  | $8$ | $\begin{array}{r} 46 \\ 2 \end{array}$ | $\begin{array}{\|l} 40 \\ 47 \\ \hline \end{array}$ | $\begin{array}{r} 9 \\ 29 \\ \hline \end{array}$ |  | $11$ | $\begin{array}{r} 32 \\ 2 \end{array}$ | $\begin{array}{\|l} 47 \\ 44 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{5 8} \\ & 33 \\ & \hline \end{aligned}$ |  | $\begin{array}{r} 14 \\ 1 \end{array}$ | $\begin{array}{r} 15 \\ 2 \end{array}$ | $\begin{aligned} & 25 \\ & 40 \\ & \hline \end{aligned}$ | $\begin{aligned} & \hline 44 \\ & 28 \end{aligned}$ | 3 |
| 4 |  | $\begin{aligned} & 4 \\ & 1 \end{aligned}$ | $\begin{array}{r} 11 \\ 2 \end{array}$ | $\begin{aligned} & \hline 19 \\ & 49 \\ & \hline \end{aligned}$ | $\begin{array}{\|c\|} \hline 38 \\ 55 \end{array}$ |  | $\begin{aligned} & 7 \\ & 1 \end{aligned}$ | $\begin{aligned} & 1 \\ & 2 \end{aligned}$ | $\begin{array}{r} \mathbf{o} \\ 49 \\ \hline \end{array}$ | $\begin{array}{\|l} 23 \\ 15 \\ \hline \end{array}$ |  | $\begin{aligned} & 9 \\ & 1 \end{aligned}$ | $\begin{array}{r} 49 \\ 2 \end{array}$ | $\begin{array}{\|l} \mathbf{2 7} \\ 47 \\ \hline \end{array}$ | $\begin{aligned} & 38 \\ & 26 \end{aligned}$ |  | $\begin{array}{r} 12 \\ 1 \end{array}$ | $\begin{array}{r} 35 \\ 2 \end{array}$ | $\begin{array}{\|l} 32 \\ 44 \\ \hline \end{array}$ | $\begin{array}{\|l} \mathbf{3 1} \\ \mathbf{2 9} \\ \hline \end{array}$ |  | $\begin{array}{r} 15 \\ 1 \end{array}$ | $\begin{array}{r} 18 \\ 2 \end{array}$ | $\begin{array}{r} 6 \\ 40 \\ \hline \end{array}$ | $\begin{array}{\|l} 12 \\ 23 \\ \hline \end{array}$ | 4 |
| 5 |  | $5$ | $\begin{array}{r} 14 \\ 2 \end{array}$ | $\begin{array}{r} 9 \\ 49 \\ \hline \end{array}$ | $\begin{aligned} & 33 \\ & 54 \\ & \hline \end{aligned}$ |  | $8$ | $3$ | $\begin{array}{\|l} 49 \\ 49 \\ \hline \end{array}$ | $\begin{aligned} & 38 \\ & 13 \end{aligned}$ |  | $\begin{array}{r} 10 \\ 1 \end{array}$ | $\begin{array}{r} 52 \\ 2 \end{array}$ | $\begin{array}{\|l} 15 \\ 47 \\ \hline \end{array}$ | $\begin{array}{r} 4 \\ 24 \\ \hline \end{array}$ |  | $\begin{array}{\|r\|} \hline 13 \\ 1 \end{array}$ | $\begin{array}{r} 38 \\ 2 \end{array}$ | $\begin{array}{\|l\|} \mathbf{1 7} \\ 44 \\ \hline \end{array}$ | $\begin{array}{r} \mathbf{0} \\ 25 \\ \hline \end{array}$ |  | $\begin{array}{r} 16 \\ 1 \end{array}$ | $\begin{array}{r} 20 \\ 2 \end{array}$ | $\begin{aligned} & 46 \\ & 40 \\ & \hline \end{aligned}$ | $\begin{aligned} & 35 \\ & 18 \end{aligned}$ | 5 |
| 6 |  | $\begin{aligned} & 6 \\ & 1 \end{aligned}$ | $\begin{array}{r} 16 \\ 2 \end{array}$ | $\begin{array}{\|l} 59 \\ 49 \\ \hline \end{array}$ | $\begin{array}{\|l} 27 \\ 55 \\ \hline \end{array}$ |  | $9$ | $6$ | $\begin{aligned} & 38 \\ & 49 \end{aligned}$ | $\begin{array}{\|l} \mathbf{5 1} \\ \mathbf{1 3} \end{array}$ |  | $\begin{array}{r} 11 \\ 1 \end{array}$ | $\begin{array}{r} 55 \\ 2 \end{array}$ | $\begin{array}{r} \mathbf{2} \\ 47 \\ \hline \end{array}$ | $\begin{aligned} & 28 \\ & 21 \end{aligned}$ |  | $\begin{array}{\|c\|} \hline 14 \\ 1 \end{array}$ | $\begin{array}{r} 41 \\ 2 \end{array}$ | $\begin{array}{\|r} 1 \\ 44 \\ \hline \end{array}$ | $\begin{array}{\|l} 25 \\ 22 \\ \hline \end{array}$ |  | $17$ | $\begin{array}{r} 23 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 26 \\ 40 \\ \hline \end{array}$ | $\begin{array}{\|l} 53 \\ 13 \\ \hline \end{array}$ | 6 |
| 7 |  | $\begin{aligned} & 7 \\ & 1 \end{aligned}$ | $\begin{array}{\|r} 19 \\ 2 \end{array}$ | $\begin{aligned} & 49 \\ & 49 \end{aligned}$ | $\begin{aligned} & 22 \\ & 54 \end{aligned}$ |  | $\begin{array}{r} 10 \\ 1 \end{array}$ | $\begin{aligned} & 9 \\ & 2 \end{aligned}$ | $\begin{aligned} & \mathbf{2 8} \\ & 49 \\ & \hline \end{aligned}$ | $\begin{array}{r} 4 \\ 11 \end{array}$ |  | $\begin{array}{r} 12 \\ 1 \end{array}$ | $\begin{array}{r} 57 \\ 2 \end{array}$ | $\begin{aligned} & 49 \\ & 47 \end{aligned}$ | $\begin{aligned} & 49 \\ & 20 \end{aligned}$ |  | $\begin{array}{\|r\|} \hline 15 \\ 1 \end{array}$ | $\begin{array}{r} 43 \\ 2 \end{array}$ | $\begin{aligned} & 45 \\ & 44 \end{aligned}$ | $\begin{aligned} & 47 \\ & 18 \end{aligned}$ |  | $\begin{array}{r} 18 \\ 1 \end{array}$ | $\begin{array}{r} 26 \\ 2 \end{array}$ | $\begin{array}{r} 7 \\ 4^{\circ} \\ \hline \end{array}$ | $\begin{aligned} & \hline 6 \\ & 9 \\ & \hline \end{aligned}$ | 7 |
| 8 |  | $\begin{aligned} & 8 \\ & 1 \end{aligned}$ | $\begin{array}{r} 22 \\ 2 \end{array}$ | $\begin{array}{\|l} 39 \\ 49 \\ \hline \end{array}$ | $\begin{aligned} & 16 \\ & 54 \end{aligned}$ |  | $\begin{array}{\|r} 11 \\ 1 \end{array}$ | $\begin{array}{r} 12 \\ 2 \end{array}$ | $\begin{aligned} & \mathbf{1 7} \\ & \mathbf{4 9} \end{aligned}$ | $\begin{array}{r} 15 \\ 9 \\ \hline \end{array}$ |  | $\begin{array}{r} 14 \\ 1 \end{array}$ | $\begin{aligned} & \mathbf{0} \\ & 2 \end{aligned}$ | $\begin{aligned} & 37 \\ & 47 \end{aligned}$ | $\begin{array}{r} 9 \\ 16 \end{array}$ |  | $\begin{array}{r} 16 \\ 1 \end{array}$ | $\begin{array}{r} 46 \\ 2 \end{array}$ | $\begin{aligned} & 30 \\ & 44 \end{aligned}$ | $\begin{array}{\|r} 5 \\ 15 \\ \hline \end{array}$ |  | $\begin{array}{\|r} 19 \\ 1 \end{array}$ | $\begin{array}{r} 28 \\ 2 \end{array}$ | $\begin{aligned} & 47 \\ & 40 \\ & \hline \end{aligned}$ | $\begin{array}{\|r} \hline 15 \\ \hline \end{array}$ | 8 |
| 9 |  | $\begin{aligned} & 9 \\ & 1 \end{aligned}$ | $\begin{array}{r} 25 \\ 2 \end{array}$ | $\begin{array}{\|l} \hline 29 \\ 49 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 10 \\ 54 \\ \hline \end{array}$ |  | $\begin{array}{r} 12 \\ 1 \end{array}$ | $\begin{array}{r} 15 \\ 2 \end{array}$ | $\begin{array}{r} 6 \\ 49 \\ \hline \end{array}$ | $\begin{array}{r} 24 \\ 9 \\ \hline \end{array}$ |  | $\begin{array}{r} 15 \\ 1 \end{array}$ | $\begin{aligned} & 3 \\ & 2 \end{aligned}$ | $\begin{array}{\|l\|} \hline \mathbf{2 4} \\ 47 \\ \hline \end{array}$ | $\begin{aligned} & 25 \\ & 14 \\ & \hline \end{aligned}$ |  | $\begin{array}{r} 17 \\ 1 \end{array}$ | $\begin{array}{r} 49 \\ 2 \end{array}$ | $\begin{array}{r} 14 \\ 44 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 20 \\ 11 \end{array}$ |  | $\begin{array}{\|r} 20 \\ 1 \\ \hline \end{array}$ | $\begin{array}{\|c} 31 \\ 2 \end{array}$ | $\begin{array}{\|l} \hline 27 \\ 39 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 19 \\ 59 \\ \hline \end{array}$ | 9 |
| 10 | 0 | $\begin{array}{r} 10 \\ 1 \end{array}$ | $\begin{array}{r} 28 \\ 2 \end{array}$ | $\begin{aligned} & 19 \\ & 49 \end{aligned}$ | $\begin{array}{r} 4 \\ 53 \\ \hline \end{array}$ | 1 | $\begin{array}{\|c} 13 \\ 1 \end{array}$ | $\begin{array}{r} 17 \\ 2 \end{array}$ | $\begin{aligned} & 55 \\ & 49 \\ & \hline \end{aligned}$ | $\begin{array}{r} 33 \\ \hline \end{array}$ | 2 | $\begin{array}{r} 16 \\ 1 \end{array}$ | $\begin{aligned} & 6 \\ & 2 \end{aligned}$ | $\begin{aligned} & \mathbf{1 1} \\ & 47 \\ & \hline \end{aligned}$ | $\begin{aligned} & 39 \\ & 12 \end{aligned}$ | 3 | $\begin{array}{r} 18 \\ 1 \end{array}$ | $\begin{array}{r} 51 \\ 2 \end{array}$ | $\begin{aligned} & 5^{8} \\ & 44 \\ & \hline \end{aligned}$ | $\begin{array}{r} \mathbf{3 1} \\ 7 \\ \hline \end{array}$ | 4 | $21$ | $34$ | $\begin{array}{\|r} 7 \\ 39 \\ \hline \end{array}$ | $\begin{aligned} & \hline \mathbf{1 8} \\ & 54 \end{aligned}$ | 10 |
| 11 |  | $\begin{array}{r} 11 \\ 1 \end{array}$ | $\begin{array}{r} 31 \\ 2 \end{array}$ | $\begin{array}{\|r} \hline 8 \\ 49 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 57 \\ 54 \\ \hline \end{array}$ |  | $\begin{array}{r} 14 \\ 1 \end{array}$ | $\begin{array}{r} 20 \\ 2 \end{array}$ | $\begin{aligned} & 44 \\ & 49 \end{aligned}$ | $\begin{array}{r} 40 \\ 6 \end{array}$ |  | $\begin{array}{r} 17 \\ 1 \end{array}$ | $\begin{aligned} & \hline 8 \\ & 2 \end{aligned}$ | $\begin{aligned} & 58 \\ & 47 \end{aligned}$ | $\begin{array}{r} 51 \\ \hline 9 \end{array}$ |  | $\begin{array}{r} 19 \\ 1 \end{array}$ | $\begin{array}{r} 54 \\ 2 \end{array}$ | $\begin{aligned} & \mathbf{4 2} \\ & 44 \\ & \hline \end{aligned}$ | $\begin{array}{\|r\|} \hline 3^{8} \\ 4 \\ \hline \end{array}$ |  | $\begin{array}{r} 22 \\ 1 \end{array}$ | $\begin{array}{r} 36 \\ 2 \end{array}$ | $\begin{array}{\|l} \hline 47 \\ 39 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 12 \\ 50 \\ \hline \end{array}$ | 11 |
| 12 |  | $12$ | $\begin{array}{r} 33 \\ 2 \end{array}$ | $\begin{array}{\|l} 58 \\ 49 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline \mathbf{5 1} \\ 53 \\ \hline \end{array}$ |  | $\begin{array}{r} 15 \\ 1 \end{array}$ | $\begin{array}{r} 23 \\ 2 \end{array}$ | $\begin{array}{\|l} 33 \\ 49 \\ \hline \end{array}$ | $\begin{array}{r} 46 \\ \hline \end{array}$ |  | $18$ | $\begin{array}{r} \hline 11 \\ 2 \\ \hline \end{array}$ | $\begin{aligned} & 46 \\ & 47 \end{aligned}$ | $\begin{aligned} & \mathbf{o} \\ & 7 \\ & \hline \end{aligned}$ |  | $20$ | $\begin{array}{r} 57 \\ 2 \end{array}$ | $\begin{aligned} & 26 \\ & 44 \\ & \hline \end{aligned}$ | $\begin{gathered} 42 \\ 0 \end{gathered}$ |  | $\begin{array}{r} 23 \\ 1 \end{array}$ | $\begin{array}{r} 39 \\ \hline 2 \end{array}$ | $\begin{array}{\|l} \hline 27 \\ 39 \\ \hline \end{array}$ | $\begin{array}{\|r} \hline \mathbf{2} \\ 45 \\ \hline \end{array}$ | 12 |
| 13 |  | $\begin{array}{r} 13 \\ 1 \end{array}$ | $\begin{array}{r} 36 \\ 2 \end{array}$ | $\begin{array}{\|l} \hline 48 \\ 49 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 44 \\ 53 \\ \hline \end{array}$ |  | $\begin{array}{r} 16 \\ 1 \end{array}$ | $\begin{array}{r} 26 \\ 2 \end{array}$ | $\begin{array}{\|l} \hline \mathbf{2 2} \\ 49 \\ \hline \end{array}$ | $\begin{array}{r} 50 \\ 3 \end{array}$ |  | $\begin{array}{r} 19 \\ 1 \\ \hline \end{array}$ | $\begin{array}{r} 14 \\ 2 \end{array}$ | $\begin{aligned} & 33 \\ & 47 \\ & \hline \end{aligned}$ | $\begin{aligned} & 7 \\ & 4 \\ & \hline \end{aligned}$ |  | $\begin{array}{r} 22 \\ 1 \end{array}$ | $\begin{aligned} & \hline 0 \\ & 2 \end{aligned}$ | $\begin{aligned} & 10 \\ & 43 \end{aligned}$ | $\begin{array}{\|l} \hline 42 \\ 57 \\ \hline \end{array}$ |  | $\begin{array}{r} 24 \\ 1 \end{array}$ | $\begin{array}{r} 42 \\ 2 \end{array}$ | $\begin{array}{\|r} \hline 6 \\ 39 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 47 \\ 40 \\ \hline \end{array}$ | 13 |
| 14 |  | $\begin{array}{r} 14 \\ 1 \end{array}$ | $\begin{array}{r} 39 \\ 2 \end{array}$ | $\begin{array}{\|l} \hline 38 \\ 49 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 37 \\ 52 \\ \hline \end{array}$ |  | $17$ | $\begin{array}{r} 29 \\ 2 \end{array}$ | $\begin{array}{\|l\|} \mathbf{1 1} \\ 49 \end{array}$ | $53$ |  | $20$ | $\begin{array}{r} 17 \\ 2 \end{array}$ | $\begin{array}{\|l} 20 \\ 47 \\ \hline \end{array}$ | $\begin{array}{r} 11 \\ 2 \end{array}$ |  | $23$ | $\begin{aligned} & 2 \\ & 2 \end{aligned}$ | $\begin{array}{\|l} 54 \\ 43 \\ \hline \end{array}$ | $\begin{aligned} & 39 \\ & 53 \\ & \hline \end{aligned}$ |  | $25$ | $\begin{array}{r} 44 \\ 2 \end{array}$ | $\begin{array}{\|l} \hline 4^{6} \\ 39 \\ \hline \end{array}$ | $\begin{array}{\|l} 27 \\ 35 \\ \hline \end{array}$ | 14 |
| 15 |  | $\begin{array}{\|r\|} \hline 15 \\ \hline \end{array}$ | $\begin{array}{r} 42 \\ 2 \end{array}$ | $\begin{array}{\|l\|} \hline \mathbf{2 8} \\ 49 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 29 \\ 53 \\ \hline \end{array}$ |  | $\begin{array}{r} 18 \\ 1 \end{array}$ | $\begin{array}{r} 32 \\ 2 \end{array}$ | $\begin{array}{r} \mathbf{o} \\ 49 \\ \hline \end{array}$ | $\begin{gathered} 55 \\ 0 \end{gathered}$ |  | $21$ | $\begin{array}{r} 20 \\ 2 \end{array}$ | $\begin{array}{r} 7 \\ 46 \\ \hline \end{array}$ | $\begin{array}{\|l} \mathbf{1 3} \\ 59 \\ \hline \end{array}$ |  | $24$ | $\begin{aligned} & 5 \\ & 2 \end{aligned}$ | $\begin{aligned} & 38 \\ & 43 \end{aligned}$ | $\begin{array}{\|l\|} \hline \mathbf{3 2}^{2} \\ 49 \\ \hline \end{array}$ |  | $\begin{array}{r} 26 \\ 1 \\ \hline \end{array}$ | $\begin{array}{r} 47 \\ 2 \end{array}$ | $\begin{array}{\|l} \hline 26 \\ 39 \\ \hline \end{array}$ | $\begin{array}{r} 2 \\ 30 \\ \hline \end{array}$ | 15 |
| 16 |  | $\begin{array}{r} 16 \\ 1 \end{array}$ | $\begin{array}{r} 45 \\ 2 \end{array}$ | $\begin{aligned} & \hline \mathbf{1 8} \\ & 49 \end{aligned}$ | $\begin{aligned} & 22 \\ & 52 \end{aligned}$ |  | $\begin{array}{r} 19 \\ 1 \end{array}$ | $\begin{array}{r} 34 \\ 2 \end{array}$ | $\begin{aligned} & 49 \\ & 48 \\ & \hline \end{aligned}$ | $\begin{aligned} & 55 \\ & 58 \\ & \hline \end{aligned}$ |  | $\begin{array}{r} 22 \\ 1 \\ \hline \end{array}$ | $\begin{array}{r} 22 \\ 2 \end{array}$ | $\begin{aligned} & 54 \\ & 46 \\ & \hline \end{aligned}$ | $\begin{aligned} & 12 \\ & 56 \\ & \hline \end{aligned}$ |  | $\begin{array}{r} 25 \\ 1 \end{array}$ | $\begin{aligned} & 8 \\ & 2 \end{aligned}$ | $\begin{array}{\|l} \mathbf{2 2} \\ 43 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{2 1} \\ & 45 \end{aligned}$ |  | $\begin{array}{r} 27 \\ 1 \end{array}$ | $\begin{array}{r} 50 \\ 20 \end{array}$ | $\begin{array}{r} 5 \\ 39 \\ \hline \end{array}$ | $\begin{aligned} & 32 \\ & 26 \end{aligned}$ | 16 |
| 17 |  | $\left.\begin{array}{r} 17 \\ 1 \end{array} \right\rvert\,$ | $\begin{array}{r} 48 \\ 2 \end{array}$ | $\begin{array}{\|r} \hline 8 \\ 49 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 14 \\ 51 \\ \hline \end{array}$ |  | $\begin{array}{r} 20 \\ 1 \end{array}$ | $\begin{array}{r} 37 \\ 2 \end{array}$ | $\begin{aligned} & 38 \\ & 48 \\ & \hline \end{aligned}$ | $\begin{aligned} & 53 \\ & 58 \\ & \hline \end{aligned}$ |  | $\begin{array}{r} 23 \\ 1 \end{array}$ | $\begin{array}{r} 25 \\ 2 \end{array}$ | $\begin{aligned} & \mathbf{4 1}^{1} \\ & 46 \end{aligned}$ | $\begin{array}{r} 8 \\ 54 \\ \hline \end{array}$ |  | $\begin{array}{r} 26 \\ 1 \end{array}$ | $\begin{array}{r} 11 \\ 2 \end{array}$ | $\begin{array}{r} 6 \\ 43 \\ \hline \end{array}$ | $\begin{array}{r} 6 \\ 41 \\ \hline \end{array}$ |  | $28$ | $\begin{array}{r} 52 \\ 2 \end{array}$ | $\begin{aligned} & 44 \\ & 39 \\ & \hline \end{aligned}$ | $\begin{aligned} & \hline 58 \\ & 20 \end{aligned}$ | 17 |
| 18 |  | $\begin{array}{\|r\|} \hline 18 \\ 1 \end{array}$ | $\begin{array}{r} 50 \\ 2 \end{array}$ | $\begin{aligned} & 58 \\ & 49 \\ & \hline \end{aligned}$ | $\begin{array}{r} 5 \\ 5^{2} \\ \hline \end{array}$ |  | $\begin{array}{r} 21 \\ 1 \end{array}$ | $\begin{array}{r} 40 \\ 2 \end{array}$ | $\begin{array}{\|l} 27 \\ 48 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{5 1} \\ & 55 \\ & \hline \end{aligned}$ |  | $\begin{array}{r} 24 \\ 1 \end{array}$ | $\begin{array}{r} 28 \\ 2 \end{array}$ | $\begin{aligned} & \mathbf{2 8} \\ & 46 \end{aligned}$ | $\begin{array}{r} 2 \\ 51 \end{array}$ |  | $\begin{array}{r} 27 \\ 1 \end{array}$ | $\begin{array}{\|r} 13 \\ 2 \end{array}$ | $\begin{array}{\|l} 49 \\ 43 \end{array}$ | $\begin{array}{\|l} 47 \\ 38 \\ \hline \end{array}$ |  | $\begin{array}{r} 29 \\ 1 \end{array}$ | $\begin{array}{r} 55 \\ 2 \end{array}$ | $\begin{array}{\|l} 24 \\ 39 \\ \hline \end{array}$ | $\begin{aligned} & \hline 18 \\ & 15 \end{aligned}$ | 18 |
| 19 |  | $\begin{array}{r} 19 \\ 1 \end{array}$ | $\begin{array}{r} 53 \\ 2 \end{array}$ | $\begin{aligned} & 47 \\ & 49 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 57 \\ 51 \\ \hline \end{array}$ |  | $\begin{array}{r} 22 \\ 1 \end{array}$ | $\begin{array}{r} 43 \\ 2 \end{array}$ | $\begin{aligned} & 16 \\ & 48 \\ & \hline \end{aligned}$ | $\begin{aligned} & 46 \\ & 54 \end{aligned}$ |  | $\begin{array}{r} 25 \\ 1 \end{array}$ | $\begin{array}{r} 3^{1} \\ 2 \end{array}$ | $\begin{aligned} & 14 \\ & 46 \end{aligned}$ | $\begin{aligned} & 53 \\ & 48 \\ & \hline \end{aligned}$ |  | $28$ | $\begin{array}{r} 16 \\ 2 \end{array}$ | $\begin{aligned} & 33 \\ & 43 \end{aligned}$ | $\begin{aligned} & 25 \\ & 34 \\ & \hline \end{aligned}$ |  | $\begin{gathered} 30 \\ 1 \end{gathered}$ | $\begin{array}{r} 58 \\ 2 \end{array}$ | $\begin{array}{r} \mathbf{3} \\ 39 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 33 \\ 11 \end{array}$ | 19 |
| 20 | 0 | $\left.\begin{array}{r} 20 \\ 1 \end{array} \right\rvert\,$ | $\begin{array}{r} 56 \\ 2 \end{array}$ | $\begin{array}{\|l} 37 \\ 49 \\ \hline \end{array}$ | $\begin{aligned} & 48 \\ & 51 \end{aligned}$ | 1 | $\begin{array}{\|c} 23 \\ 1 \end{array}$ | $\begin{array}{r} 46 \\ 2 \end{array}$ | $\begin{array}{r} 5 \\ 48 \\ \hline \end{array}$ | $\begin{aligned} & 40 \\ & 53 \end{aligned}$ | 2 | $26$ | $\begin{array}{r} 34 \\ 2 \end{array}$ | $\begin{array}{r} 1 \\ 46 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{4 1} \\ & 46 \end{aligned}$ | 3 | $\begin{array}{r} 29 \\ 1 \end{array}$ | $\begin{array}{\|r} 19 \\ 2 \end{array}$ | $\begin{aligned} & \hline \mathbf{1 6} \\ & 43 \end{aligned}$ | $\begin{array}{\|l} 59 \\ 30 \\ \hline \end{array}$ | 4 | $\begin{gathered} 32 \\ 1 \end{gathered}$ | $\begin{aligned} & 0 \\ & 2 \end{aligned}$ | $\begin{aligned} & 42 \\ & 39 \\ & \hline \end{aligned}$ | $\begin{array}{r} 44 \\ \hline \end{array}$ | 20 |
| 21 |  | $21$ | $\begin{array}{r} 59 \\ 29 \end{array}$ | $\begin{array}{\|l} 27 \\ 49 \\ \hline \end{array}$ | $\begin{aligned} & 39 \\ & 50 \\ & \hline \end{aligned}$ |  | $\begin{array}{r} 24 \\ 1 \end{array}$ | $\begin{array}{r} 48 \\ 2 \end{array}$ | $\begin{aligned} & 54 \\ & 48 \\ & \hline \end{aligned}$ | $\begin{aligned} & 33 \\ & 51 \end{aligned}$ |  | $27$ | $\begin{array}{r} 36 \\ 2 \end{array}$ | $\begin{aligned} & 48 \\ & 46 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 27 \\ 43 \\ \hline \end{array}$ |  | $\begin{array}{\|c\|} \hline 30 \\ \hline \end{array}$ | $\begin{array}{r} 22 \\ 2 \\ \hline \end{array}$ | $\begin{array}{r} \hline \mathbf{o} \\ 43 \\ \hline \end{array}$ | $\begin{aligned} & 29 \\ & 26 \\ & \hline \end{aligned}$ |  | $\begin{array}{\|c} 33 \\ 1 \\ \hline \end{array}$ | $\begin{aligned} & 3 \\ & 2 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 21 \\ 39 \\ \hline \end{array}$ | $\begin{gathered} 50 \\ 0 \end{gathered}$ | 21 |
| 22 |  | $\left\|\begin{array}{r} 23 \\ 1 \end{array}\right\|$ | $\begin{aligned} & 2 \\ & 2 \end{aligned}$ | $\begin{aligned} & \mathbf{1 7} \\ & 49 \end{aligned}$ | $\begin{aligned} & 29 \\ & 50 \\ & \hline \end{aligned}$ |  | $\begin{array}{r} 25 \\ 1 \end{array}$ | $\begin{array}{r} 51 \\ 2 \end{array}$ | $\begin{aligned} & 43 \\ & 48 \end{aligned}$ | $\begin{aligned} & 24 \\ & 50 \end{aligned}$ |  | $\begin{array}{r} 28 \\ 1 \end{array}$ | $\begin{array}{\|r} 39 \\ 2 \end{array}$ | $\begin{aligned} & 35 \\ & 46 \end{aligned}$ | $\begin{aligned} & 10 \\ & \mathbf{4}^{1} \end{aligned}$ |  | $\mathbf{3}^{1}$ | $\begin{array}{r} 24 \\ 2 \end{array}$ | $\begin{array}{\|l} 43 \\ 43 \end{array}$ | $\begin{aligned} & 55 \\ & 23 \\ & \hline \end{aligned}$ |  | $\begin{array}{r} 34 \\ 1 \end{array}$ | $6$ | $\begin{array}{r} \mathbf{0} \\ 3^{8} \\ \hline \end{array}$ | $\begin{aligned} & 50 \\ & 56 \end{aligned}$ | 22 |
| 23 |  | $\left\|\begin{array}{r} 24 \\ 1 \end{array}\right\|$ | $\begin{aligned} & 5 \\ & 2 \end{aligned}$ | $\begin{array}{r} 7 \\ 49 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 19 \\ 49 \\ \hline \end{array}$ |  | $26$ | $\begin{array}{r} 54 \\ 2 \end{array}$ | $\begin{aligned} & 32 \\ & 48 \\ & \hline \end{aligned}$ | $\begin{aligned} & 14 \\ & 48 \\ & \hline \end{aligned}$ |  | $29$ | $\begin{array}{r} 42 \\ 2 \end{array}$ | $\begin{aligned} & 21 \\ & 46 \end{aligned}$ | $\begin{array}{\|l} \mathbf{5 1} \\ 37 \\ \hline \end{array}$ |  | $\mathbf{3 2}^{2}$ | $\begin{array}{r} 27 \\ 2 \end{array}$ | $\begin{array}{\|l} 27 \\ 43 \\ \hline \end{array}$ | $\begin{aligned} & 18 \\ & 18 \end{aligned}$ |  | $35$ | $8$ | $\begin{array}{\|l} 39 \\ 38 \\ \hline \end{array}$ | $\begin{aligned} & 46 \\ & 50 \end{aligned}$ | 23 |
| 24 |  | $\begin{array}{r} 25 \\ 1 \end{array}$ | $\begin{aligned} & 7 \\ & 2 \end{aligned}$ | $\begin{array}{\|l} 57 \\ 49 \\ \hline \end{array}$ | $\begin{array}{r} 8 \\ 49 \\ \hline \end{array}$ |  | $\begin{array}{r} 27 \\ 1 \end{array}$ | $\begin{array}{r} 57 \\ 2 \end{array}$ | $\begin{array}{\|l\|} \mathbf{2 1} \\ 48 \\ \hline \end{array}$ | $\begin{array}{r} 2 \\ 46 \\ \hline \end{array}$ |  | $\begin{array}{r} 30 \\ 1 \end{array}$ | $\begin{array}{r} 45 \\ 2 \end{array}$ | $\begin{array}{r} 8 \\ 46 \end{array}$ | $\begin{aligned} & \mathbf{2 8} \\ & 35 \end{aligned}$ |  | $\begin{gathered} 33 \\ 1 \end{gathered}$ | $\begin{array}{r} 30 \\ 2 \end{array}$ | $\begin{aligned} & \mathbf{1 0} \\ & 43 \end{aligned}$ | $\begin{aligned} & 36 \\ & 15 \\ & \hline \end{aligned}$ |  | $\begin{array}{r} 36 \\ 1 \end{array}$ | $\begin{array}{r} 11 \\ 2 \end{array}$ | $\begin{aligned} & 18 \\ & 38 \end{aligned}$ | $\begin{aligned} & 36 \\ & 46 \end{aligned}$ | 24 |
| 25 |  | $\begin{array}{r} 26 \\ 1 \end{array}$ | $\begin{array}{r} 10 \\ 2 \end{array}$ | $\begin{aligned} & \hline 46 \\ & 49 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 57 \\ 48 \\ \hline \end{array}$ |  | $29$ | $\begin{aligned} & 0 \\ & 2 \end{aligned}$ | $\begin{array}{r} 9 \\ 4^{8} \\ \hline \end{array}$ | $\begin{aligned} & 48 \\ & 45 \\ & \hline \end{aligned}$ |  | $3_{1}^{1}$ | $\begin{array}{r} 47 \\ 2 \end{array}$ | $\begin{aligned} & 55 \\ & 46 \\ & \hline \end{aligned}$ | $\begin{array}{r} 3 \\ 3^{2} \\ \hline \end{array}$ |  | $34$ | $\begin{array}{r} 3^{2} \\ 2 \end{array}$ | $\begin{array}{\|l} 53 \\ 43 \\ \hline \end{array}$ | $\begin{array}{\|l} 51 \\ 10 \end{array}$ |  | $\begin{array}{r} 37 \\ 1 \end{array}$ | $\begin{array}{r} 13 \\ 2 \end{array}$ | $\begin{aligned} & 57 \\ & 38 \\ & \hline \end{aligned}$ | $\begin{aligned} & 22 \\ & 40 \\ & \hline \end{aligned}$ | 25 |
| 26 |  | $\begin{array}{r} 27 \\ 1 \end{array}$ | $\begin{array}{\|r} 13 \\ 2 \end{array}$ | $\begin{array}{\|l\|} \hline 36 \\ 49 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 45 \\ 48 \\ \hline \end{array}$ |  | $\begin{gathered} 30 \\ 1 \end{gathered}$ | $\begin{aligned} & 2 \\ & 2 \end{aligned}$ | $\begin{aligned} & 58 \\ & 48 \end{aligned}$ | $\begin{array}{\|l} 33 \\ 43 \\ \hline \end{array}$ |  | $\begin{array}{r} 32 \\ 1 \end{array}$ | $\begin{array}{r} 50 \\ 2 \end{array}$ | $\begin{aligned} & 41 \\ & 46 \\ & \hline \end{aligned}$ | $\begin{aligned} & 35 \\ & 30 \end{aligned}$ |  | $35$ | $\begin{array}{r} 35 \\ 2 \end{array}$ | $\begin{array}{\|l} 37 \\ 43 \\ \hline \end{array}$ | 1 7 |  | $38$ | $\begin{array}{r} 16 \\ \hline 2 \\ \hline \end{array}$ | $\begin{aligned} & \hline 36 \\ & 38 \\ & \hline \end{aligned}$ | $\begin{array}{\|r} \hline 2 \\ 3^{6} \\ \hline \end{array}$ | 26 |
| 27 |  | $28$ | $\begin{array}{r} 16 \\ 2 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 26 \\ 49 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 33 \\ 48 \\ \hline \end{array}$ |  | $31$ | $5$ | $\begin{aligned} & 47 \\ & 48 \\ & \hline \end{aligned}$ | $\begin{aligned} & 16 \\ & 41 \\ & \hline \end{aligned}$ |  | $\begin{array}{r} 33 \\ 1 \end{array}$ | $\begin{array}{r} 53 \\ 2 \end{array}$ | $\begin{aligned} & 28 \\ & 46 \end{aligned}$ | $\begin{array}{r} 5 \\ 26 \end{array}$ |  | $\begin{gathered} 36 \\ 1 \end{gathered}$ | $\begin{array}{r} 38 \\ 2 \end{array}$ | $\begin{array}{\|l} 20 \\ 43 \end{array}$ | $\begin{aligned} & \hline 8 \\ & 3 \\ & \hline \end{aligned}$ |  | $39$ | $\begin{array}{r} 19 \\ \hline 2 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 14 \\ 38 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 38 \\ 30 \\ \hline \end{array}$ | 27 |
| 28 |  | $\begin{array}{r} 29 \\ 1 \end{array}$ | $\begin{array}{r} 19 \\ 2 \end{array}$ | $\begin{array}{\|l\|} \hline \mathbf{1 6} \\ 49 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 21 \\ 47 \\ \hline \end{array}$ |  | $\begin{array}{r} 32 \\ 1 \end{array}$ | $\begin{aligned} & \hline 8 \\ & 2 \\ & \hline \end{aligned}$ | $\begin{aligned} & 35 \\ & 48 \end{aligned}$ | $\begin{aligned} & 57 \\ & 40 \\ & \hline \end{aligned}$ |  | $\begin{array}{r} 34 \\ 1 \end{array}$ | $\begin{array}{r} 56 \\ 2 \end{array}$ | $\begin{aligned} & 14 \\ & 46 \end{aligned}$ | $\begin{array}{\|l} \mathbf{3 1} \\ \mathbf{2 4} \end{array}$ |  | $\begin{array}{\|r} 37 \\ 1 \end{array}$ | $\begin{array}{r} 41 \\ 2 \end{array}$ | $\begin{array}{r} 3 \\ 4^{2} \\ \hline \end{array}$ | $\begin{aligned} & \hline \mathbf{1 1} \\ & 59 \end{aligned}$ |  | $\begin{gathered} 40 \\ 1 \end{gathered}$ | $\begin{array}{r} 21 \\ 2 \end{array}$ | $\begin{array}{\|l} \hline 53 \\ 38 \\ \hline \end{array}$ | 8 25 | 28 |
| 29 |  | $\begin{gathered} 30 \\ 1 \end{gathered}$ | $\begin{array}{r} 22 \\ 2 \end{array}$ | $\begin{array}{\|r\|} \hline 6 \\ 49 \\ \hline \end{array}$ | $\begin{array}{\|r\|} \hline 8 \\ 46 \\ \hline \end{array}$ |  | $\begin{gathered} 33 \\ 1 \end{gathered}$ | $\begin{array}{r} 11 \\ 2 \end{array}$ | $\begin{array}{\|l} 24 \\ 48 \\ \hline \end{array}$ | $\begin{array}{\|l} 37 \\ 38 \\ \hline \end{array}$ |  | $\begin{array}{r} 35 \\ 1 \end{array}$ | $\begin{array}{\|r} 59 \\ 2 \end{array}$ | $\begin{array}{r} 0 \\ 46 \\ \hline \end{array}$ | $\begin{aligned} & 55 \\ & 21 \end{aligned}$ |  | $\begin{array}{r} 38 \\ 1 \end{array}$ | $\begin{array}{r} 43 \\ 2 \end{array}$ | $\begin{aligned} & 4^{6} \\ & 4^{2} \end{aligned}$ | $\begin{array}{\|l} 10 \\ 54 \\ \hline \end{array}$ |  | $\begin{gathered} 41 \\ 1 \end{gathered}$ | $\begin{array}{r} 24 \\ 2 \end{array}$ | $\begin{array}{\|l} \mathbf{3 1} \\ 3^{8} \\ \hline \end{array}$ | $\begin{array}{\|l\|} 33 \\ 20 \end{array}$ | 29 |
| 30 | 0 | $\left[\begin{array}{r} 31 \\ 1 \end{array}\right.$ | $\begin{gathered} 24 \\ 2 \end{gathered}$ | $\begin{array}{\|} 55 \\ 49 \\ \hline \end{array}$ | $\begin{aligned} & 54 \\ & 46 \\ & \hline \end{aligned}$ | 1 | $\begin{gathered} 34 \\ 1 \end{gathered}$ | $\begin{array}{\|r} 14 \\ 2 \end{array}$ | $\begin{array}{\|l} 13 \\ 48 \\ \hline \end{array}$ | $\begin{aligned} & 15 \\ & 36 \end{aligned}$ | 2 | $\begin{array}{r} 37 \\ 1 \end{array}$ | $\begin{aligned} & 1 \\ & 2 \end{aligned}$ | $\begin{array}{\|l} 47 \\ 46 \end{array}$ | $\begin{aligned} & 16 \\ & 18 \end{aligned}$ | 3 | $\begin{gathered} 39 \\ 1 \end{gathered}$ | $\begin{array}{r} 46 \\ 2 \end{array}$ | $\begin{aligned} & 29 \\ & 42 \\ & \hline \end{aligned}$ | $\begin{array}{\|r} 4 \\ 51 \\ \hline \end{array}$ | 4 | $\begin{gathered} 42 \\ 1 \end{gathered}$ | $\begin{array}{r} 27 \\ 2 \end{array}$ | $\begin{array}{r} 9 \\ 38 \\ \hline \end{array}$ | $\begin{array}{\|l} 53 \\ 15 \\ \hline \end{array}$ | 30 |

Bürgi's 1' sine table (reconstruction, D. Roegel, 2016)

| , | $0^{\circ}$ |  |  |  |  | $1^{\circ}$ |  |  |  |  | $2^{\circ}$ |  |  |  |  | $3^{\circ}$ |  |  |  |  | $4^{\circ}$ |  |  |  |  | , |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 30 | 0 | $\mathbf{3}_{1}$ | $\begin{array}{r} 24 \\ 2 \end{array}$ | $\begin{array}{\|l\|} \hline 55 \\ 49 \\ \hline \end{array}$ | $\begin{array}{\|l} 54 \\ 46 \\ \hline \end{array}$ | 1 | $\begin{array}{r} 34 \\ 1 \end{array}$ | $\begin{array}{\|r\|} \hline 14 \\ 2 \end{array}$ | $\begin{aligned} & 13 \\ & 48 \\ & \hline \end{aligned}$ | $\begin{aligned} & 15 \\ & 36 \end{aligned}$ | 2 | $\begin{array}{r} 37 \\ 1 \end{array}$ | $\begin{aligned} & 1 \\ & 2 \end{aligned}$ | $\begin{aligned} & 47 \\ & 46 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 16 \\ 18 \\ \hline \end{array}$ | 3 | $39$ | $\begin{array}{r} 46 \\ 2 \end{array}$ | $\begin{array}{\|l\|} \hline 29 \\ 42 \\ \hline \end{array}$ | $\begin{array}{\|r} \hline 4 \\ 51 \\ \hline \end{array}$ | 4 | $42$ | $\begin{array}{r} 27 \\ 2 \end{array}$ | $\begin{array}{r} 9 \\ 38 \\ \hline \end{array}$ | $\begin{array}{\|l} 53 \\ 15 \\ \hline \end{array}$ | 30 |
| 31 |  | $\begin{array}{r} 32 \\ 1 \end{array}$ | $\begin{array}{\|r} 27 \\ 2 \end{array}$ | $\begin{array}{\|l\|} \hline 45 \\ 49 \\ \hline \end{array}$ | $\begin{aligned} & 40 \\ & 45 \end{aligned}$ |  | $\begin{array}{r} 35 \\ 1 \end{array}$ | $\begin{array}{r} 17 \\ 2 \end{array}$ | $\begin{array}{r} 1 \\ 4^{8} \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{5 1} \\ & 35 \\ & \hline \end{aligned}$ |  | $\begin{array}{r} 38 \\ 1 \end{array}$ | $\begin{aligned} & 4 \\ & 2 \\ & \hline \end{aligned}$ | $\begin{aligned} & 33 \\ & 46 \end{aligned}$ | $\begin{array}{\|l\|} \hline 34 \\ 15 \\ \hline \end{array}$ |  | $\begin{array}{r} 40 \\ 1 \end{array}$ | $\begin{array}{r} 49 \\ 2 \end{array}$ | $\begin{aligned} & 11 \\ & 42 \\ & \hline \end{aligned}$ | $\begin{aligned} & 55 \\ & 47 \end{aligned}$ |  | $\begin{array}{r} 43 \\ 1 \end{array}$ | $\begin{array}{r} 29 \\ 2 \end{array}$ | $\begin{array}{\|l} \hline 48 \\ 38 \\ \hline \end{array}$ | $\begin{aligned} & \hline 8 \\ & 9 \\ & \hline \end{aligned}$ | 31 |
| 32 |  | $33$ | $\begin{array}{r} 30 \\ 20 \end{array}$ | $\begin{array}{\|l\|} \hline 35 \\ 49 \\ \hline \end{array}$ | $\begin{array}{\|l} 25 \\ 45 \\ \hline \end{array}$ |  | $\begin{gathered} 36 \\ 1 \end{gathered}$ | $\begin{array}{r} 19 \\ \hline 2 \\ \hline \end{array}$ | $\begin{aligned} & 50 \\ & 48 \\ & \hline \end{aligned}$ | $\begin{aligned} & \mathbf{2 6} \\ & 33 \end{aligned}$ |  | $\begin{array}{r} 39 \\ 1 \end{array}$ | $\begin{aligned} & 7 \\ & 2 \end{aligned}$ | $\begin{aligned} & 19 \\ & 46 \end{aligned}$ | $\begin{aligned} & 49 \\ & 12 \end{aligned}$ |  | $4 \mathbf{1}$ | $\begin{array}{r} 51 \\ 2 \end{array}$ | $\begin{aligned} & 54 \\ & 4^{2} \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 4^{2} \\ 4^{2} \\ \hline \end{array}$ |  | $44$ | $\begin{array}{r} 32 \\ 2 \end{array}$ | $\begin{aligned} & \hline 26 \\ & 38 \\ & \hline \end{aligned}$ | $\begin{array}{r} 17 \\ \hline \end{array}$ | 32 |
| 33 |  | $\begin{array}{\|c} 34 \\ 1 \end{array}$ | $\underset{23}{33}$ | $\begin{array}{\|l} 25 \\ 49 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{1 0} \\ & 43 \\ & \hline \end{aligned}$ |  | $\begin{array}{r} 37 \\ 1 \end{array}$ | $\begin{array}{r} 22 \\ 2 \end{array}$ | $\begin{aligned} & 38 \\ & 48 \\ & \hline \end{aligned}$ | $\begin{aligned} & 59 \\ & 31 \\ & \hline \end{aligned}$ |  | $\begin{gathered} 40 \\ 1 \end{gathered}$ | $\begin{array}{r} 10 \\ 2 \end{array}$ | $\begin{array}{r} 6 \\ 4^{6} \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{1} \\ & 9 \\ & \hline \end{aligned}$ |  | $\begin{array}{r} 42 \\ 1 \end{array}$ | $\begin{array}{r} 54 \\ 2 \end{array}$ | $\begin{array}{\|l} 37 \\ 4^{2} \\ \hline \end{array}$ | $\begin{array}{\|l} \mathbf{2 4} \\ 39 \\ \hline \end{array}$ |  | $\begin{gathered} 45 \\ 1 \end{gathered}$ | $\begin{array}{r} 35 \\ 2 \end{array}$ | $\begin{array}{r} 4 \\ 37 \\ \hline \end{array}$ | $\begin{array}{\|l} \mathbf{2 2} \\ 59 \\ \hline \end{array}$ | 33 |
| 34 |  | $\left\lvert\, \begin{array}{r} 35 \\ 1 \end{array}\right.$ | $\begin{array}{r} 36 \\ 2 \end{array}$ | $\begin{aligned} & 14 \\ & 49 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 53 \\ 44 \end{array}$ |  | $\begin{array}{r} 38 \\ 1 \end{array}$ | $\begin{array}{r} 25 \\ 2 \end{array}$ | $\begin{array}{\|} 27 \\ 48 \\ \hline \end{array}$ | $\begin{aligned} & 30 \\ & 29 \\ & \hline \end{aligned}$ |  | $\begin{array}{r} 41 \\ 1 \end{array}$ | $\begin{array}{r} 12 \\ 2 \end{array}$ | $\begin{aligned} & 52 \\ & 46 \\ & \hline \end{aligned}$ | $\begin{array}{r} 10 \\ \hline 6 \end{array}$ |  | $\begin{array}{r} 43 \\ 1 \end{array}$ | $\begin{array}{r} 57 \\ 27 \end{array}$ | $\begin{aligned} & 20 \\ & 42 \end{aligned}$ | $\begin{array}{r} 3 \\ 35 \\ \hline \end{array}$ |  | $46$ | $\begin{array}{r} 37 \\ 2 \end{array}$ | $\begin{array}{\|l} \hline 42 \\ 37 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 21 \\ 54 \\ \hline \end{array}$ | 34 |
| 35 |  | $\begin{array}{r} 36 \\ 1 \end{array}$ | $\begin{array}{r} 39 \\ 2 \end{array}$ | $\begin{array}{r} 4 \\ 49 \\ \hline \end{array}$ | $\begin{aligned} & 37 \\ & 42 \\ & \hline \end{aligned}$ |  | $\begin{array}{r} 39 \\ 1 \end{array}$ | $\begin{array}{r} 28 \\ 2 \end{array}$ | $\begin{aligned} & 15 \\ & 48 \\ & \hline \end{aligned}$ | $\begin{aligned} & 59 \\ & 27 \end{aligned}$ |  | $\begin{array}{r} 42 \\ 1 \end{array}$ | $\begin{array}{r} 15 \\ 2 \end{array}$ | $\begin{aligned} & 38 \\ & 46 \end{aligned}$ | $\begin{array}{r} 16 \\ \hline 4 \end{array}$ |  | $\begin{array}{r} 45 \\ 1 \end{array}$ | $\begin{aligned} & \hline 0 \\ & 2 \end{aligned}$ | $\begin{array}{r} 2 \\ 4^{2} \end{array}$ | $\begin{aligned} & 3^{8} \\ & 30 \end{aligned}$ |  | $\begin{array}{r} 47 \\ \hline 1 \end{array}$ | $\begin{array}{r} 40 \\ 20 \end{array}$ | $\begin{aligned} & 20 \\ & 37 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 15 \\ 49 \\ \hline \end{array}$ | 35 |
| 36 |  | $\begin{array}{\|r} 37 \\ 1 \end{array}$ | $\begin{array}{\|r} 41 \\ 21 \end{array}$ | $\begin{aligned} & 54 \\ & 49 \end{aligned}$ | $\begin{aligned} & 19 \\ & 4^{2} \end{aligned}$ |  | $\begin{array}{r} 40 \\ 1 \end{array}$ | $\begin{array}{r} 31 \\ 2 \end{array}$ | $\begin{array}{r} 4 \\ 48 \end{array}$ | $\begin{aligned} & 26 \\ & 26 \end{aligned}$ |  | $\begin{array}{r} 43 \\ 1 \end{array}$ | $\begin{array}{r} 18 \\ 2 \end{array}$ | $\begin{aligned} & 24 \\ & 46 \end{aligned}$ | $\begin{array}{r} 20 \\ 0 \end{array}$ |  | $\begin{array}{r} 46 \\ 1 \end{array}$ | $\begin{aligned} & 2 \\ & 2 \end{aligned}$ | $\begin{aligned} & 45 \\ & 42 \end{aligned}$ | $\begin{array}{\|r} 8 \\ 26 \end{array}$ |  | $\begin{array}{r} 48 \\ 1 \end{array}$ | $\begin{array}{r} 42 \\ 2 \end{array}$ | $\begin{aligned} & \hline 58 \\ & 37 \\ & \hline \end{aligned}$ | $\begin{array}{r} 4 \\ 43 \end{array}$ | 36 |
| 37 |  | $\begin{array}{\|c} 3^{8} \\ 1 \end{array}$ | $\begin{array}{r} 44 \\ 2 \end{array}$ | $\begin{array}{\|} 44 \\ 49 \\ \hline \end{array}$ | $\begin{array}{\|r} 1 \\ 41 \\ \hline \end{array}$ |  | $\begin{array}{r} 41 \\ 1 \end{array}$ | $33$ | $\begin{array}{\|l} 52 \\ 48 \\ \hline \end{array}$ | $\begin{aligned} & 5^{2} \\ & 24 \\ & \hline \end{aligned}$ |  | $\begin{gathered} 44 \\ 1 \end{gathered}$ | $\begin{array}{r} 21 \\ 2 \end{array}$ | $\begin{aligned} & 10 \\ & 45 \end{aligned}$ | $\begin{aligned} & 20 \\ & 57 \end{aligned}$ |  | $47$ | $\begin{aligned} & 5 \\ & 2 \end{aligned}$ | $\begin{aligned} & \mathbf{2 7} \\ & 42 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 34 \\ 22 \end{array}$ |  | $49$ | $\begin{array}{r} 45 \\ 2 \end{array}$ | $\begin{array}{\|l\|} \hline 35 \\ 37 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 47 \\ 38 \\ \hline \end{array}$ | 37 |
| $3^{8}$ |  | $\begin{gathered} 39 \\ 1 \end{gathered}$ | $\begin{array}{r} 47 \\ 2 \end{array}$ | $\begin{aligned} & 33 \\ & 49 \\ & \hline \end{aligned}$ | $\begin{aligned} & 42 \\ & 41 \end{aligned}$ |  | $\begin{array}{r} 42 \\ 1 \end{array}$ | $\begin{array}{r} 36 \\ 2 \end{array}$ | $\begin{aligned} & 41 \\ & 48 \end{aligned}$ | $\begin{aligned} & \hline 16 \\ & 21 \end{aligned}$ |  | $\begin{array}{r} 45 \\ 1 \end{array}$ | $\begin{array}{\|r} 23 \\ 2 \end{array}$ | $\begin{aligned} & 56 \\ & 45 \end{aligned}$ | $\begin{array}{\|l} \mathbf{1 7} \\ 55 \\ \hline \end{array}$ |  | $\begin{array}{r} 48 \\ 1 \end{array}$ | $\begin{aligned} & 8 \\ & 2 \end{aligned}$ | $\begin{array}{r} 9 \\ 4^{2} \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{5 6} \\ & \mathbf{1 8} \end{aligned}$ |  | $\underset{1}{50}$ | $\begin{array}{r} 48 \\ 2 \end{array}$ | $\begin{array}{\|l} 13 \\ 37 \\ \hline \end{array}$ | $\begin{aligned} & \hline 25 \\ & 33 \end{aligned}$ | 38 |
| 39 |  | $\begin{array}{r} 40 \\ 1 \end{array}$ | $\begin{array}{r} 50 \\ 20 \end{array}$ | $\begin{array}{\|l} \hline 23 \\ 49 \\ \hline \end{array}$ | $\begin{aligned} & 23 \\ & 40 \\ & \hline \end{aligned}$ |  | $\begin{array}{r} 43 \\ 1 \end{array}$ | $\begin{array}{r} 39 \\ 2 \end{array}$ | $\begin{aligned} & 29 \\ & 48 \\ & \hline \end{aligned}$ | $\begin{aligned} & 37 \\ & 20 \end{aligned}$ |  | $\begin{array}{r} 46 \\ 1 \end{array}$ | $\begin{array}{r} 26 \\ 2 \end{array}$ | $\begin{aligned} & 42 \\ & 45 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 12 \\ 51 \\ \hline \end{array}$ |  | $\begin{array}{r} 49 \\ 1 \end{array}$ | $\begin{array}{r} 10 \\ 2 \end{array}$ | $\begin{aligned} & \mathbf{5 2}^{2} \\ & \mathbf{4}^{2} \end{aligned}$ | $\begin{array}{r} \hline 14 \\ 14 \\ \hline \end{array}$ |  | $\begin{array}{r} 51 \\ 1 \end{array}$ | $\begin{array}{r} 50 \\ 2 \end{array}$ | $\begin{array}{\|l\|} \hline 50 \\ 37 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 58 \\ 27 \\ \hline \end{array}$ | 39 |
| 40 | 0 | $41$ | $\begin{array}{r} 53 \\ 2 \end{array}$ | $\begin{array}{\|l\|} \hline 13 \\ 49 \\ \hline \end{array}$ | $\begin{array}{r} 3 \\ 39 \\ \hline \end{array}$ | 1 | $\begin{array}{r} 44 \\ 1 \end{array}$ | $\begin{array}{r} 42 \\ 2 \\ \hline \end{array}$ | $\begin{aligned} & 17 \\ & 48 \\ & \hline \end{aligned}$ | $\begin{aligned} & 57 \\ & 18 \\ & \hline \end{aligned}$ | 2 | $47$ | $\begin{array}{r} 29 \\ 2 \end{array}$ | $\begin{aligned} & \mathbf{2 8} \\ & 45 \\ & \hline \end{aligned}$ | $\begin{array}{\|r} 3 \\ 48 \\ \hline \end{array}$ | 3 | $50$ | $\begin{array}{\|r} 13 \\ \hline 2 \\ \hline \end{array}$ | $\begin{aligned} & 34 \\ & \mathbf{4}^{2} \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 28 \\ 10 \\ \hline \end{array}$ | 4 | $\begin{array}{r} 52 \\ 1 \\ \hline \end{array}$ | $53$ | $\begin{array}{\|l\|} \hline 28 \\ 37 \\ \hline \end{array}$ | $\begin{aligned} & 25 \\ & 23 \\ & \hline \end{aligned}$ | 40 |
| 41 |  | $\begin{array}{r} 42 \\ 1 \end{array}$ | $\begin{array}{r} 56 \\ 2 \end{array}$ | $\begin{array}{r} \mathbf{2} \\ 49 \\ \hline \end{array}$ | $\begin{aligned} & 42 \\ & 3^{8} \end{aligned}$ |  | $\begin{array}{r} 45 \\ 1 \end{array}$ | $\begin{array}{r} 45 \\ 2 \end{array}$ | $\begin{array}{r} 6 \\ 48 \\ \hline \end{array}$ | $\begin{aligned} & 15 \\ & 16 \end{aligned}$ |  | $\begin{array}{r} 48 \\ 1 \end{array}$ | $\begin{array}{r} 32 \\ 2 \end{array}$ | $\begin{aligned} & 13 \\ & 45 \end{aligned}$ | $\begin{array}{\|l} \mathbf{5 1} \\ \mathbf{4 5} \\ \hline \end{array}$ |  | $51$ | $\begin{array}{r} 16 \\ 2 \end{array}$ | $\begin{aligned} & 16 \\ & 42 \end{aligned}$ | $\begin{array}{r} 38 \\ 5 \end{array}$ |  | $\begin{array}{r} 53 \\ 1 \end{array}$ | $\begin{array}{r} 56 \\ 2 \end{array}$ | $\begin{array}{r} 5 \\ 37 \end{array}$ | $\begin{aligned} & 48 \\ & 16 \end{aligned}$ | $4^{1}$ |
| 42 |  | $\begin{array}{r} 43 \\ 1 \end{array}$ | $\begin{array}{r} 58 \\ 2 \end{array}$ | $\begin{array}{\|l\|} \hline \mathbf{5}^{2} \\ 49 \\ \hline \end{array}$ | $\begin{aligned} & 20 \\ & 37 \\ & \hline \end{aligned}$ |  | $46$ | $\begin{array}{r} 47 \\ 2 \end{array}$ | $\begin{aligned} & \mathbf{5 4} \\ & 48 \\ & \hline \end{aligned}$ | $\begin{aligned} & \hline \mathbf{3 1} \\ & \mathbf{1 5} \\ & \hline \end{aligned}$ |  | $\begin{array}{r} 49 \\ 1 \end{array}$ | $34$ | $\begin{aligned} & 59 \\ & 45 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 36 \\ 42 \\ \hline \end{array}$ |  | $\begin{array}{r} 52 \\ 1 \end{array}$ | $\begin{array}{r} 18 \\ \hline 2 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 58 \\ 4^{2} \\ \hline \end{array}$ | $\begin{array}{r} 43 \\ 1 \end{array}$ |  | $54$ | $\begin{array}{r} 58 \\ 2 \end{array}$ | $\begin{array}{\|l} \hline 43 \\ 37 \\ \hline \end{array}$ | $\begin{array}{r} 4 \\ 12 \\ \hline \end{array}$ | 42 |
| 43 |  | $\begin{array}{r} 45 \\ 1 \end{array}$ | $2$ | $\begin{aligned} & 41 \\ & 49 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 57 \\ 37 \\ \hline \end{array}$ |  | $47$ | $\begin{array}{r} 50 \\ 20 \end{array}$ | $\begin{aligned} & 42 \\ & 48 \\ & \hline \end{aligned}$ | $\begin{aligned} & 46 \\ & 12 \end{aligned}$ |  | $\begin{gathered} 50 \\ 1 \end{gathered}$ | $\begin{array}{r} 37 \\ 2 \end{array}$ | $\begin{aligned} & 45 \\ & 45 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline \mathbf{1 8} \\ 39 \\ \hline \end{array}$ |  | $53$ | $\begin{array}{r} 21 \\ 2 \end{array}$ | $\begin{aligned} & 40 \\ & 41 \end{aligned}$ | $\begin{array}{\|l} \hline 44 \\ 57 \\ \hline \end{array}$ |  | $\begin{gathered} 56 \\ 1 \end{gathered}$ | $2$ | $\begin{array}{\|} 20 \\ 37 \\ \hline \end{array}$ | $\begin{array}{r} 16 \\ \hline 6 \end{array}$ | 43 |
| 44 |  | $\begin{array}{r} 46 \\ 1 \end{array}$ | $\begin{aligned} & 4 \\ & 2 \end{aligned}$ | $\begin{array}{\|l} \mathbf{3 1} \\ 49 \\ \hline \end{array}$ | $\begin{aligned} & 34 \\ & 36 \end{aligned}$ |  | $\begin{array}{r} 48 \\ 1 \end{array}$ | $53$ | $\begin{aligned} & 30 \\ & 48 \\ & \hline \end{aligned}$ | $\begin{aligned} & 58 \\ & 10 \end{aligned}$ |  | $\begin{array}{r} 51 \\ 1 \end{array}$ | $\begin{array}{r} 40 \\ 20 \end{array}$ | $\begin{aligned} & 3 \mathbf{0} \\ & 45 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 57 \\ 36 \\ \hline \end{array}$ |  | $\begin{array}{r} 54 \\ 1 \end{array}$ | $\begin{array}{r} 24 \\ 2 \end{array}$ | $\begin{array}{\|l} 22 \\ 41 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline \mathbf{4 1} \\ 52 \\ \hline \end{array}$ |  | 57 1 | $\begin{aligned} & \mathbf{3} \\ & \mathbf{2} \end{aligned}$ | $\begin{array}{\|l} \hline 57 \\ 37 \\ \hline \end{array}$ | $\begin{array}{r} 22 \\ 0 \end{array}$ | 44 |
| 45 |  | $\begin{array}{r} 47 \\ 1 \end{array}$ | $2$ | $\begin{array}{r} \mathbf{2 1} \\ 49 \\ \hline \end{array}$ | $\begin{aligned} & 10 \\ & 34 \\ & \hline \end{aligned}$ |  | $\begin{array}{r} 49 \\ 1 \end{array}$ | $\begin{array}{r} 56 \\ 2 \end{array}$ | $\begin{array}{\|l} \hline 19 \\ 48 \\ \hline \end{array}$ | $\begin{aligned} & 8 \\ & 8 \end{aligned}$ |  | $52$ | $43$ | $\begin{aligned} & \mathbf{1 6} \\ & 45 \end{aligned}$ | $\begin{array}{\|l\|} \hline 33 \\ 32 \\ \hline \end{array}$ |  | $55$ | $\begin{array}{r} 27 \\ 2 \end{array}$ | $\begin{array}{r} 4 \\ 41 \\ \hline \end{array}$ | $\begin{array}{\|l} 33 \\ 49 \\ \hline \end{array}$ |  | $\begin{array}{r} 58 \\ 1 \end{array}$ | $\begin{aligned} & 6 \\ & 2 \end{aligned}$ | $\begin{array}{\|l\|} \hline 34 \\ 36 \\ \hline \end{array}$ | $\begin{array}{\|l} \mathbf{2 2} \\ 55 \\ \hline \end{array}$ | 45 |
| 46 |  | $\begin{array}{r} 48 \\ 1 \end{array}$ | $\begin{array}{r} 10 \\ 2 \\ \hline \end{array}$ | $\begin{aligned} & 10 \\ & 49 \\ & \hline \end{aligned}$ | $\begin{aligned} & 44 \\ & 34 \\ & \hline \end{aligned}$ |  | $\begin{gathered} 50 \\ 1 \end{gathered}$ | $\begin{array}{r} 59 \\ 2 \end{array}$ | $\begin{array}{r} 7 \\ 48 \\ \hline \end{array}$ | $\begin{array}{r} 16 \\ 6 \end{array}$ |  | $53$ | $\begin{array}{r} 46 \\ 2 \end{array}$ | $\begin{array}{r} 2 \\ 45 \\ \hline \end{array}$ | $\begin{array}{r} 5 \\ 30 \\ \hline \end{array}$ |  | $\begin{gathered} 56 \\ 1 \end{gathered}$ | $\begin{array}{r} 29 \\ 2 \end{array}$ | $\begin{aligned} & 46 \\ & 41 \end{aligned}$ | $\begin{array}{\|l} \mathbf{2 2} \\ 43 \\ \hline \end{array}$ |  | $59$ | $\begin{aligned} & 9 \\ & 2 \end{aligned}$ | $\begin{array}{\|l\|} \hline 11 \\ 3^{6} \\ \hline \end{array}$ | $\begin{array}{\|l} \mathbf{1 7} \\ 50 \\ \hline \end{array}$ | 46 |
| 47 |  | $\begin{gathered} 49 \\ 1 \end{gathered}$ | $\begin{array}{\|r} 13 \\ 2 \end{array}$ | $\begin{array}{r} \mathbf{0} \\ 49 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{1 8} \\ & 33 \end{aligned}$ |  | $52$ | $2$ | $\begin{array}{\|l\|} \hline 55 \\ 48 \end{array}$ | $\begin{array}{r} 22 \\ 4 \end{array}$ |  | $54$ | $48$ | $\begin{array}{\|l} 47 \\ 45 \end{array}$ | $\begin{aligned} & 35 \\ & 26 \end{aligned}$ |  | $\begin{array}{\|r} 57 \\ 1 \end{array}$ | $\begin{array}{r} 3^{2} \\ 2 \end{array}$ | $\begin{aligned} & \mathbf{2 8} \\ & 41 \end{aligned}$ | $\begin{array}{r} 5 \\ 40 \end{array}$ | 5 | $0$ | $\begin{array}{r} 11 \\ 2 \end{array}$ | $\begin{array}{\|l} \hline 48 \\ 36 \\ \hline \end{array}$ | $\begin{array}{r} 7 \\ \hline 44 \\ \hline \end{array}$ | 47 |
| 48 |  | $\begin{array}{r} 50 \\ 1 \end{array}$ | $\begin{array}{r} 15 \\ 2 \end{array}$ | $\begin{aligned} & 49 \\ & 49 \\ & \hline \end{aligned}$ | $\begin{aligned} & \mathbf{5 1} \\ & 33 \end{aligned}$ |  | $53$ | $\begin{aligned} & 4 \\ & 2 \end{aligned}$ | $\begin{aligned} & 43 \\ & 48 \\ & \hline \end{aligned}$ | $\begin{array}{r} 26 \\ 2 \end{array}$ |  | $\begin{array}{r} 55 \\ 1 \end{array}$ | $\begin{array}{r} 51 \\ 2 \end{array}$ | $\begin{aligned} & 33 \\ & 45 \end{aligned}$ | $\begin{array}{\|r} 1 \\ 23 \\ \hline \end{array}$ |  | $\begin{array}{r} 58 \\ 1 \end{array}$ | $\begin{array}{r} 35 \\ 2 \end{array}$ | $\begin{array}{r} 9 \\ 41 \end{array}$ | $\begin{aligned} & 45 \\ & 35 \\ & \hline \end{aligned}$ |  | $1$ | $\begin{array}{r} 14 \\ \hline 2 \end{array}$ | $\begin{aligned} & 24 \\ & 36 \\ & \hline \end{aligned}$ | $\begin{aligned} & \mathbf{5 1} \\ & 39 \end{aligned}$ | 48 |
| 49 |  | $\left\lvert\, \begin{array}{r} 51 \\ 1 \end{array}\right.$ | $\begin{array}{r} 18 \\ 2 \end{array}$ | $\begin{array}{\|l} 39 \\ 49 \\ \hline \end{array}$ | $\begin{array}{\|l} 24 \\ 31 \\ \hline \end{array}$ |  | $\begin{array}{r} 54 \\ 1 \end{array}$ | $\begin{aligned} & 7 \\ & 2 \end{aligned}$ | $\begin{array}{\|l\|} \hline \mathbf{3 1} \\ 48 \end{array}$ | $\begin{gathered} 28 \\ 0 \end{gathered}$ |  | $\begin{array}{r} 56 \\ 1 \end{array}$ | $\begin{array}{\|r} 54 \\ 2 \end{array}$ | $\begin{aligned} & \mathbf{1 8} \\ & 45 \end{aligned}$ | $\begin{array}{\|l} 24 \\ 20 \end{array}$ |  | $59$ | $\begin{array}{r} 37 \\ 2 \end{array}$ | $\begin{array}{\|l} \mathbf{5 1} \\ \mathbf{4 1} \end{array}$ | $\begin{array}{\|l} 20 \\ 31 \\ \hline \end{array}$ |  | 2 | $\begin{array}{r} 17 \\ 2 \end{array}$ | $\begin{array}{r} \mathbf{1} \\ 36 \\ \hline \end{array}$ | $\begin{aligned} & 30 \\ & 33 \end{aligned}$ | 49 |
| 50 | 0 | $\begin{array}{\|r\|} \hline 52 \\ 1 \end{array}$ | $\begin{array}{r} 21 \\ 2 \end{array}$ | $\begin{array}{\|l\|} \hline 28 \\ 49 \\ \hline \end{array}$ | $\begin{aligned} & 55 \\ & 30 \end{aligned}$ | 1 | $\begin{array}{r} 55 \\ 1 \end{array}$ | $\begin{array}{r} 10 \\ 2 \end{array}$ | $\begin{aligned} & \hline 19 \\ & 47 \\ & \hline \end{aligned}$ | $\begin{aligned} & 28 \\ & 58 \\ & \hline \end{aligned}$ | 2 | $\begin{array}{\|r} 57 \\ 1 \end{array}$ | $\begin{array}{r} 57 \\ \hline 2 \end{array}$ | $\begin{array}{r} 3 \\ 45 \\ \hline \end{array}$ | $\begin{aligned} & 44 \\ & 16 \end{aligned}$ | 4 | $\mathbf{0}$ | $\begin{array}{r} 40 \\ 2 \end{array}$ | $\begin{aligned} & 32 \\ & \mathbf{4}^{1} \end{aligned}$ | $\begin{aligned} & \mathbf{5 1} \\ & \mathbf{2 6} \end{aligned}$ | 5 | $3$ | $\begin{array}{r} 19 \\ 2 \end{array}$ | $\begin{aligned} & 38 \\ & 36 \\ & \hline \end{aligned}$ | $\begin{array}{r} 3 \\ 27 \\ \hline \end{array}$ | 50 |
| 51 |  | $53$ | $\begin{array}{\|r} 24 \\ 2 \end{array}$ | $\begin{array}{\|l\|} \hline 18 \\ 49 \\ \hline \end{array}$ | $\begin{array}{\|l} 25 \\ 29 \\ \hline \end{array}$ |  | $\begin{gathered} 56 \\ 1 \end{gathered}$ | $\begin{array}{r} 13 \\ 2 \end{array}$ | $\begin{array}{r} 7 \\ 47 \\ \hline \end{array}$ | $\begin{aligned} & 26 \\ & 56 \\ & \hline \end{aligned}$ |  | $\begin{array}{r} 58 \\ 1 \end{array}$ | $59$ | $\begin{aligned} & 49 \\ & 45 \\ & \hline \end{aligned}$ | $\begin{array}{r} 0 \\ 14 \\ \hline \end{array}$ |  | 1 | $\begin{array}{r} 43 \\ 2 \end{array}$ | $\begin{array}{\|l} 14 \\ 41 \\ \hline \end{array}$ | $\begin{aligned} & 17 \\ & \mathbf{2 2} \end{aligned}$ |  | 4 | $\begin{array}{r} 22 \\ 2 \end{array}$ | $\begin{aligned} & 14 \\ & 36 \\ & \hline \end{aligned}$ | $\begin{aligned} & 30 \\ & 22 \end{aligned}$ | 51 |
| 52 |  | $\begin{array}{r} 54 \\ 1 \end{array}$ | $\begin{array}{r} 27 \\ 2 \end{array}$ | $\begin{array}{\|r} 7 \\ 49 \\ \hline \end{array}$ | $\begin{aligned} & 54 \\ & 29 \\ & \hline \end{aligned}$ |  | $\begin{array}{r} 57 \\ 1 \end{array}$ | $\begin{array}{\|r\|} \hline 15 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 55 \\ 47 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 22 \\ 53 \\ \hline \end{array}$ | 3 | $0$ | $\begin{aligned} & 2 \\ & 2 \end{aligned}$ | $\begin{aligned} & 34 \\ & 45 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 14 \\ 10 \\ \hline \end{array}$ |  | $\begin{aligned} & 2 \\ & 1 \end{aligned}$ | $\begin{array}{r} 45 \\ 2 \end{array}$ | $\begin{aligned} & 55 \\ & 41 \end{aligned}$ | $\begin{array}{\|l} \hline 39 \\ 18 \\ \hline \end{array}$ |  | $5$ | $\begin{array}{r} 24 \\ \hline 2 \end{array}$ | $\begin{array}{\|l} \hline 50 \\ 36 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline \mathbf{5 2}^{2} \\ \mathbf{1 7} \\ \hline \end{array}$ | 52 |
| 53 |  | $\begin{array}{\|r} 55 \\ 1 \end{array}$ | $\begin{array}{\|r} 29 \\ 2 \end{array}$ | $\begin{array}{\|l} 57 \\ 49 \\ \hline \end{array}$ | $\begin{array}{\|l} 23 \\ 27 \\ \hline \end{array}$ |  | $\begin{array}{r} 58 \\ 1 \end{array}$ | $\begin{array}{r} 18 \\ 2 \end{array}$ | $\begin{array}{\|l} 43 \\ 47 \end{array}$ | $\begin{aligned} & 15 \\ & 5^{2} \end{aligned}$ |  | $1$ | $\begin{aligned} & 5 \\ & 2 \end{aligned}$ | $\begin{aligned} & 19 \\ & 45 \\ & \hline \end{aligned}$ | $\begin{array}{r} 24 \\ 6 \end{array}$ |  | $3$ | $\begin{array}{r} 48 \\ 2 \end{array}$ | $\begin{aligned} & 36 \\ & 41 \end{aligned}$ | $\begin{array}{\|l} 57 \\ 13 \\ \hline \end{array}$ |  | $6$ | $\begin{array}{r} 27 \\ 2 \end{array}$ | $\begin{aligned} & 27 \\ & 36 \end{aligned}$ | $\begin{array}{r} 9 \\ 10 \end{array}$ | 53 |
| 54 |  | $\begin{gathered} 56 \\ 1 \end{gathered}$ | $\begin{array}{r} 32 \\ 2 \end{array}$ | $\begin{array}{\|l} \hline 46 \\ 49 \\ \hline \end{array}$ | $\begin{aligned} & 50 \\ & 26 \end{aligned}$ |  | $\begin{array}{r} 59 \\ 1 \end{array}$ | $\begin{array}{r} 21 \\ \hline 2 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline \mathbf{3 1} \\ 47 \\ \hline \end{array}$ | $\begin{array}{r} 7 \\ 49 \\ \hline \end{array}$ |  | $2$ | $\begin{aligned} & 8 \\ & 2 \end{aligned}$ | $\begin{array}{r} 4 \\ 45 \\ \hline \end{array}$ | $\begin{array}{r} 30 \\ \hline \end{array}$ |  | $4$ | $\begin{array}{r} 51 \\ 2 \end{array}$ | $\begin{array}{\|l\|} \hline \mathbf{1 8} \\ \mathbf{4 1}^{1} \\ \hline \end{array}$ | $\begin{array}{r} \hline 10 \\ \hline 9 \\ \hline \end{array}$ |  | 7 | $\begin{array}{r} 30 \\ 20 \end{array}$ | $\begin{array}{\|r} \hline 3 \\ 36 \\ \hline \end{array}$ | $\begin{array}{r} 19 \\ 6 \end{array}$ | 54 |
| 55 |  | $\begin{array}{r} 57 \\ 1 \end{array}$ | $\begin{array}{r} 35 \\ 2 \end{array}$ | $\begin{aligned} & 36 \\ & 49 \end{aligned}$ | $\begin{aligned} & 16 \\ & 25 \end{aligned}$ | 2 | $\mathbf{0}$ | $\begin{array}{\|c} 24 \\ 2 \end{array}$ | $\begin{aligned} & \hline \mathbf{1 8} \\ & 47 \end{aligned}$ | $\begin{aligned} & \mathbf{5 6} \\ & 47 \end{aligned}$ |  | $3$ | $\begin{array}{\|r} 10 \\ 2 \end{array}$ | $\begin{aligned} & 49 \\ & 45 \end{aligned}$ | $\begin{array}{r} 34 \\ 0 \end{array}$ |  | $5$ | $\begin{array}{r} 53 \\ 2 \end{array}$ | $\begin{aligned} & 59 \\ & 41 \end{aligned}$ | $\begin{array}{r} 19 \\ 4 \end{array}$ |  | 8 | $\begin{array}{r} 32 \\ 2 \end{array}$ | $\begin{aligned} & 39 \\ & 35 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \mathbf{2 5} \\ 59 \end{array}$ | 55 |
| 56 |  | $\begin{array}{r} 58 \\ 1 \end{array}$ | $\begin{gathered} 38 \\ 2 \end{gathered}$ | $\begin{array}{\|l\|} \hline 25 \\ 49 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{4 1} \\ & \mathbf{2 5} \end{aligned}$ |  | $\begin{aligned} & 1 \\ & 1 \end{aligned}$ | $\begin{array}{r} 27 \\ 2 \end{array}$ | $\begin{array}{\|r} \hline 6 \\ 47 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 43 \\ 45 \\ \hline \end{array}$ |  | $\begin{aligned} & 4 \\ & 1 \end{aligned}$ | $13$ | $\begin{array}{\|} 34 \\ 44 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 34 \\ 56 \\ \hline \end{array}$ |  | $6$ | $\begin{array}{r} 56 \\ 2 \end{array}$ | $\begin{aligned} & 40 \\ & 40 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 23 \\ 59 \\ \hline \end{array}$ |  | 9 1 | $\begin{array}{r} 35 \\ 2 \end{array}$ | $\begin{aligned} & \hline 15 \\ & 35 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \mathbf{2 4} \\ 54 \\ \hline \end{array}$ | 56 |
| 57 |  | $\underset{1}{59}$ | $\begin{array}{\|r} 41 \\ 2 \end{array}$ | $\begin{array}{\|l\|} \hline 15 \\ 49 \\ \hline \end{array}$ | $\begin{array}{r} 6 \\ 23 \\ \hline \end{array}$ |  | $2$ | $\begin{array}{r} 29 \\ 2 \end{array}$ | $\begin{array}{\|l} 54 \\ 47 \\ \hline \end{array}$ | $\begin{aligned} & 28 \\ & 42 \\ & \hline \end{aligned}$ |  | $5$ | $\begin{array}{r} 16 \\ 2 \end{array}$ | $\begin{aligned} & 19 \\ & 44 \\ & \hline \end{aligned}$ | $\begin{aligned} & \mathbf{3 0} \\ & 53 \end{aligned}$ |  | 7 | $\begin{array}{r} 59 \\ 2 \end{array}$ | $\begin{array}{\|l} 21 \\ 40 \\ \hline \end{array}$ | $\begin{array}{\|l} \mathbf{2 2} \\ 55 \\ \hline \end{array}$ |  | 10 | $\begin{array}{r} 37 \\ 2 \end{array}$ | $\begin{array}{\|l} \mathbf{5 1} \\ \mathbf{3 5} \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 18 \\ 48 \\ \hline \end{array}$ | 57 |
| 58 | 1 | $0$ | $\begin{gathered} 44 \\ 2 \end{gathered}$ | $\begin{array}{r} 4 \\ 49 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 29 \\ 21 \end{array}$ |  | $3$ | $\begin{array}{r} 3^{2} \\ 2 \end{array}$ | $\begin{aligned} & 42 \\ & 47 \end{aligned}$ | $\begin{array}{\|l\|} 10 \\ 41 \\ \hline \end{array}$ |  | $6$ | $\begin{array}{r} 19 \\ 2 \end{array}$ | $\begin{array}{r} 4 \\ 44 \\ \hline \end{array}$ | $\begin{array}{\|l} 23 \\ 50 \\ \hline \end{array}$ |  | 9 1 | $2$ | $\begin{array}{r} 2 \\ 40 \\ \hline \end{array}$ | $\begin{array}{\|l} 17 \\ 51 \\ \hline \end{array}$ |  | 11 | $\begin{array}{r} 40 \\ 20 \end{array}$ | $\begin{aligned} & \mathbf{2 7} \\ & 35 \\ & \hline \end{aligned}$ | 6 43 | 58 |
| 59 |  | $\begin{aligned} & 1 \\ & 1 \end{aligned}$ | $\begin{array}{r} 46 \\ 2 \end{array}$ | $\begin{array}{\|l\|} \hline 53 \\ 49 \\ \hline \end{array}$ | $\begin{aligned} & 50 \\ & 21 \end{aligned}$ |  | $4$ | $\begin{array}{r} 35 \\ 2 \end{array}$ | $\begin{aligned} & 29 \\ & 47 \end{aligned}$ | $\begin{aligned} & \mathbf{5 1} \\ & 3^{8} \\ & \hline \end{aligned}$ |  | $7$ | $\begin{array}{r} 21 \\ 2 \end{array}$ | $\begin{aligned} & 49 \\ & 44 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 13 \\ 47 \\ \hline \end{array}$ |  | 10 | $\begin{aligned} & 4 \\ & 2 \end{aligned}$ | $\begin{aligned} & 43 \\ & 40 \\ & \hline \end{aligned}$ | $\begin{array}{r} 8 \\ 4^{6} \\ \hline \end{array}$ |  | $\begin{array}{r} 12 \\ 1 \end{array}$ | $43$ | $\begin{array}{\|r} \hline \mathbf{2} \\ 35 \\ \hline \end{array}$ | $\begin{aligned} & 49 \\ & 37 \end{aligned}$ | 59 |
| 60 | 1 | $2$ | $\begin{array}{r} 49 \\ 2 \end{array}$ | $\begin{aligned} & 43 \\ & 49 \\ & \hline \end{aligned}$ | $\left\lvert\, \begin{aligned} & 11 \\ & 20 \end{aligned}\right.$ | 2 | $5$ | $\begin{array}{r} 38 \\ 2 \end{array}$ | $\begin{array}{\|l} \mathbf{1 7} \\ 47 \\ \hline \end{array}$ | $\begin{array}{r} 29 \\ 35 \\ \hline \end{array}$ | 3 | $8$ | $\begin{array}{\|r} 24 \\ 2 \end{array}$ | $\begin{array}{\|} 34 \\ 44 \\ \hline \end{array}$ | $\begin{array}{\|r} \mathbf{o} \\ 43 \\ \hline \end{array}$ | 4 | $11$ | $\begin{aligned} & 7 \\ & 2 \end{aligned}$ | $\begin{array}{\|l} 23 \\ 40 \\ \hline \end{array}$ | $\begin{array}{\|l} 54 \\ 41 \\ \hline \end{array}$ | 5 | $\begin{array}{\|c} 13 \\ 1 \end{array}$ | $\begin{array}{r} 45 \\ 2 \end{array}$ | $\begin{array}{\|l} \hline 38 \\ 35 \\ \hline \end{array}$ | $\begin{aligned} & 26 \\ & 31 \end{aligned}$ | 60 |

Bürgi's 1' sine table (reconstruction, D. Roegel, 2016)

| 1 | $5^{\circ}$ |  |  |  |  | $6^{\circ}$ |  |  |  |  | $7^{\circ}$ |  |  |  |  | $8^{\circ}$ |  |  |  |  | $9^{\circ}$ |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 0 | 5 | $\begin{array}{\|r\|} \hline 13 \\ 1 \end{array}$ | $\begin{array}{r} 45 \\ 2 \end{array}$ | $\begin{aligned} & \hline 38 \\ & 35 \end{aligned}$ | $\begin{array}{\|l\|} \hline 26 \\ 31 \\ \hline \end{array}$ | 6 | $\begin{array}{r} 16 \\ 1 \end{array}$ | $\begin{array}{r} 18 \\ 2 \end{array}$ | $\begin{array}{r} 8 \\ 29 \\ \hline \end{array}$ | $\begin{array}{\|l} 53 \\ 12 \end{array}$ | 7 | $\begin{array}{r} 18 \\ 1 \end{array}$ | $\begin{array}{r} 43 \\ 2 \end{array}$ | $\begin{array}{\|c\|} \hline 46 \\ 21 \end{array}$ | $\begin{aligned} & \mathbf{4 1} \\ & \mathbf{4 5} \end{aligned}$ | 8 | $\begin{array}{r} 21 \\ 1 \end{array}$ | $\begin{aligned} & 1 \\ & 2 \end{aligned}$ | $\begin{array}{\|l} 23 \\ 13 \\ \hline \end{array}$ | $\begin{array}{r} 23 \\ 9 \\ \hline \end{array}$ | 9 | $\begin{array}{r} 23 \\ 1 \end{array}$ | $\begin{aligned} & 9 \\ & 2 \end{aligned}$ | $\begin{array}{r} 50 \\ 3 \end{array}$ | $\begin{array}{\|l} 40 \\ 25 \end{array}$ | 0 |
| 1 |  | $\begin{array}{r} 14 \\ 1 \end{array}$ | $\begin{array}{r} 48 \\ 2 \end{array}$ | $\begin{array}{\|l\|} \hline 13 \\ 35 \\ \hline \end{array}$ | $\begin{array}{\|l} 57 \\ 25 \\ \hline \end{array}$ |  | $\begin{array}{r} 17 \\ 1 \end{array}$ | $\begin{array}{r} 20 \\ 2 \end{array}$ | $\begin{aligned} & 38 \\ & 29 \end{aligned}$ | $\begin{aligned} & 5 \\ & 5 \\ & \hline \end{aligned}$ |  | $19$ | $\begin{array}{r} 46 \\ 2 \end{array}$ | $\begin{array}{r} 8 \\ 21 \\ \hline \end{array}$ | $\begin{aligned} & 26 \\ & 37 \end{aligned}$ |  | $22$ | $\begin{aligned} & 3 \\ & 2 \end{aligned}$ | $\begin{array}{\|l} \hline 36 \\ 13 \\ \hline \end{array}$ | $\begin{gathered} 32 \\ 0 \end{gathered}$ |  | $\begin{array}{r} 24 \\ 1 \end{array}$ | $\begin{array}{r} 11 \\ \hline 2 \end{array}$ | $54$ | $\begin{array}{\|r} \hline 5 \\ 14 \\ \hline \end{array}$ | 1 |
| 2 |  | $\begin{array}{\|r\|} \hline 15 \\ 1 \end{array}$ | $\begin{gathered} 50 \\ 2 \end{gathered}$ | $\begin{aligned} & 49 \\ & 35 \end{aligned}$ | $\begin{aligned} & 22 \\ & 19 \\ & \hline \end{aligned}$ |  | $\begin{array}{r} 18 \\ 1 \end{array}$ | $\begin{array}{r} 23 \\ 2 \end{array}$ | $\begin{array}{r} 7 \\ 28 \end{array}$ | $\begin{aligned} & 10 \\ & 59 \end{aligned}$ |  | $\begin{array}{r} 20 \\ 1 \end{array}$ | $\begin{array}{r} 48 \\ 2 \end{array}$ | $\begin{aligned} & 30 \\ & 21 \end{aligned}$ | $\begin{array}{r} 3 \\ 28 \end{array}$ |  | $\begin{array}{\|r\|} \hline 23 \\ 1 \end{array}$ | $\begin{aligned} & 5 \\ & 2 \end{aligned}$ | $\begin{array}{\|l\|} \hline 49 \\ 12 \end{array}$ | $\begin{aligned} & 3^{2} \\ & 50 \\ & \hline \end{aligned}$ |  | $\begin{array}{r} 25 \\ 1 \end{array}$ | $\begin{array}{r} 13 \\ 2 \end{array}$ | $\begin{array}{r} 57 \\ \hline \end{array}$ | $\begin{array}{r} 19 \\ \hline \end{array}$ | 2 |
| 3 |  | $\begin{array}{r} 16 \\ 1 \\ \hline \end{array}$ | $\begin{array}{\|r\|} \hline 53 \\ 2 \end{array}$ | $\begin{array}{\|l} \mathbf{2 4} \\ 35 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline \mathbf{4 1} \\ 14 \\ \hline \end{array}$ |  | $\begin{array}{\|c} 19 \\ 1 \\ \hline \end{array}$ | $\begin{array}{r} 25 \\ 2 \end{array}$ | $\begin{aligned} & 36 \\ & 28 \end{aligned}$ | $\begin{array}{r} 9 \\ 51 \end{array}$ |  | 12 1 | $\begin{array}{r} 50 \\ 2 \end{array}$ | $\begin{array}{\|l} 51 \\ 21 \end{array}$ | $\begin{aligned} & \mathbf{3 1} \\ & \mathbf{2 1} \end{aligned}$ |  | $\begin{array}{\|c\|} 24 \\ 1 \end{array}$ | $\begin{aligned} & 8 \\ & 2 \end{aligned}$ | $\begin{array}{r} 2 \\ 12 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 22 \\ 41 \\ \hline \end{array}$ |  | $\begin{array}{r} 26 \\ 1 \end{array}$ | $\begin{array}{r} 16 \\ \hline 2 \\ \hline \end{array}$ | $\begin{aligned} & \mathrm{O} \\ & 2 \end{aligned}$ | $\begin{array}{\|l} 23 \\ 54 \\ \hline \end{array}$ | 3 |
| 4 |  | $\begin{array}{r} 17 \\ 1 \end{array}$ | $\begin{array}{r} 55 \\ 2 \end{array}$ | $\begin{array}{\|l} 59 \\ 35 \\ \hline \end{array}$ | $\begin{array}{r} 55 \\ 8 \end{array}$ |  | $\begin{array}{r} 20 \\ 1 \end{array}$ | $\begin{array}{r} 28 \\ 2 \end{array}$ | $\begin{array}{r} 5 \\ 28 \end{array}$ | $\begin{array}{r} \mathbf{o} \\ 44 \\ \hline \end{array}$ |  | $\begin{array}{r} 22 \\ 1 \end{array}$ | $\begin{array}{r} 53 \\ 2 \end{array}$ | $\begin{aligned} & 12 \\ & 21 \\ & \hline \end{aligned}$ | $\begin{aligned} & 52 \\ & 12 \end{aligned}$ |  | $\begin{array}{r} 25 \\ 1 \end{array}$ | $\begin{array}{\|r} 10 \\ 2 \end{array}$ | $\begin{array}{\|l\|} \hline 15 \\ 12 \end{array}$ | $\begin{array}{r} 3 \\ 3^{2} \\ \hline \end{array}$ |  | $27$ | $\begin{array}{r} 18 \\ 2 \end{array}$ | $\begin{aligned} & 3 \\ & 2 \end{aligned}$ | $\begin{array}{\|l} \mathbf{1 7} \\ \mathbf{4 3} \\ \hline \end{array}$ | 4 |
| 5 |  | $\begin{array}{r} 18 \\ 1 \end{array}$ | $\begin{array}{r} 58 \\ 2 \end{array}$ | $\begin{aligned} & 35 \\ & 35 \\ & \hline \end{aligned}$ | $\begin{aligned} & 3 \\ & 2 \end{aligned}$ |  | $\begin{array}{r} 21 \\ 1 \end{array}$ | $\begin{array}{r} 30 \\ 20 \end{array}$ | $\begin{aligned} & 33 \\ & 28 \end{aligned}$ | $\begin{aligned} & 44 \\ & 38 \\ & \hline \end{aligned}$ |  | $\begin{array}{r} 23 \\ 1 \end{array}$ | $\begin{array}{r} 55 \\ 2 \end{array}$ | $\begin{aligned} & 34 \\ & 21 \end{aligned}$ | $\begin{aligned} & 4 \\ & 4 \\ & \hline \end{aligned}$ |  | $\begin{array}{r} 26 \\ 1 \end{array}$ | $\begin{array}{r} 12 \\ 2 \end{array}$ | $\begin{aligned} & 27 \\ & 12 \end{aligned}$ | $\begin{array}{\|l} 35 \\ 23 \\ \hline \end{array}$ |  | $28$ | $\begin{array}{r} 20 \\ 2 \end{array}$ | $6$ | $\begin{array}{r} \mathbf{o} \\ 33 \\ \hline \end{array}$ | 5 |
| 6 |  | $\begin{array}{r} 20 \\ 1 \end{array}$ | $\begin{aligned} & 1 \\ & 2 \end{aligned}$ | $\begin{array}{\|l} 10 \\ 34 \\ \hline \end{array}$ | $\begin{array}{r} 5 \\ 56 \\ \hline \end{array}$ |  | $\begin{array}{r} 22 \\ 1 \end{array}$ | $\begin{array}{r} 33 \\ 2 \end{array}$ | $\begin{array}{r} 2 \\ 28 \end{array}$ | $\begin{aligned} & 22 \\ & 30 \end{aligned}$ |  | $\begin{array}{r} 24 \\ 1 \end{array}$ | $\begin{array}{r} 57 \\ 2 \end{array}$ | $\begin{aligned} & 55 \\ & 20 \end{aligned}$ | $\begin{array}{r} 8 \\ 56 \end{array}$ |  | $\begin{array}{r} 27 \\ 1 \end{array}$ | $\begin{array}{r} 14 \\ 2 \end{array}$ | $\begin{aligned} & 39 \\ & 12 \end{aligned}$ | $\begin{aligned} & 58 \\ & 13 \end{aligned}$ |  | $\begin{array}{r} 29 \\ 1 \end{array}$ | $\begin{array}{r} 22 \\ 2 \end{array}$ | $\begin{aligned} & 8 \\ & 2 \end{aligned}$ | $\left\lvert\, \begin{aligned} & 33 \\ & 23 \end{aligned}\right.$ | 6 |
| 7 |  | $\begin{array}{r} 21 \\ 1 \end{array}$ | $\begin{aligned} & 3 \\ & 2 \end{aligned}$ | $\begin{aligned} & 45 \\ & 34 \end{aligned}$ | $\begin{array}{\|r} 1 \\ 51 \\ \hline \end{array}$ |  | $\begin{array}{r} 23 \\ 1 \end{array}$ | $\begin{array}{r} 35 \\ 2 \end{array}$ | $\begin{aligned} & 30 \\ & 28 \end{aligned}$ | $\begin{aligned} & 52 \\ & 24 \\ & \hline \end{aligned}$ |  | $\begin{array}{r} 26 \\ 1 \end{array}$ | $\begin{aligned} & 0 \\ & 2 \end{aligned}$ | $\begin{aligned} & 16 \\ & 20 \end{aligned}$ | $\begin{array}{r} 4 \\ 4^{8} \\ \hline \end{array}$ |  | $\begin{array}{r} 28 \\ 1 \end{array}$ | $\begin{array}{r} 16 \\ 2 \end{array}$ | $\begin{aligned} & 52 \\ & 12 \end{aligned}$ | $\begin{array}{\|r} \mathbf{1 1} \\ 5 \\ \hline \end{array}$ |  | $\begin{array}{r} 30 \\ 1 \end{array}$ | $\begin{array}{r} 24 \\ 2 \end{array}$ | $\begin{array}{r} 10 \\ 2 \end{array}$ | $\begin{aligned} & 56 \\ & 12 \end{aligned}$ | 7 |
| 8 |  | $\begin{array}{r} 22 \\ 1 \end{array}$ | $\begin{aligned} & 6 \\ & 2 \end{aligned}$ | $\begin{aligned} & 19 \\ & 34 \\ & \hline \end{aligned}$ | $\begin{aligned} & \mathbf{5 2} \\ & 44 \\ & \hline \end{aligned}$ |  | $\begin{array}{r} 24 \\ 1 \end{array}$ | $\begin{array}{r} 37 \\ 2 \end{array}$ | $\begin{aligned} & 59 \\ & 28 \end{aligned}$ | $\begin{array}{\|l\|} \hline 16 \\ 16 \end{array}$ |  | $\begin{array}{r} 27 \\ 1 \end{array}$ | $\begin{aligned} & 2 \\ & 2 \end{aligned}$ | $\begin{aligned} & 36 \\ & 20 \end{aligned}$ | $\begin{aligned} & 52 \\ & 40 \\ & \hline \end{aligned}$ |  | $\begin{array}{r} 29 \\ 1 \end{array}$ | $\begin{array}{r} 19 \\ 2 \end{array}$ | $\begin{array}{r} 4 \\ 11 \end{array}$ | $\begin{aligned} & 16 \\ & 54 \\ & \hline \end{aligned}$ |  | $\begin{array}{r} 31 \\ 1 \end{array}$ | $\begin{array}{r} 26 \\ 2 \end{array}$ | $\begin{array}{r} 13 \\ 2 \end{array}$ | $\begin{aligned} & 8 \\ & 1 \end{aligned}$ | 8 |
| 9 |  | $\left.\begin{array}{r} 23 \\ 1 \end{array} \right\rvert\,$ | $\begin{aligned} & 8 \\ & 2 \end{aligned}$ | $\begin{array}{\|l} 54 \\ 34 \\ \hline \end{array}$ | $\begin{aligned} & 36 \\ & 39 \end{aligned}$ |  | $\begin{array}{r} 25 \\ 1 \end{array}$ | $\begin{array}{r} 40 \\ 20 \end{array}$ | $\begin{aligned} & 27 \\ & 28 \end{aligned}$ | $\begin{aligned} & 32 \\ & 10 \end{aligned}$ |  | $\begin{array}{r} 28 \\ 1 \end{array}$ | $\begin{aligned} & 4 \\ & 2 \end{aligned}$ | $\begin{aligned} & 57 \\ & 20 \end{aligned}$ | $\begin{aligned} & 32 \\ & 32 \end{aligned}$ |  | $\begin{gathered} 30 \\ 1 \end{gathered}$ | $\begin{array}{r} 21 \\ 2 \end{array}$ | $\begin{aligned} & \hline 16 \\ & 11 \end{aligned}$ | $\begin{array}{\|l} 10 \\ 46 \\ \hline \end{array}$ |  | $\begin{gathered} 32 \\ 1 \end{gathered}$ | $\begin{array}{r} 28 \\ 2 \end{array}$ | $\begin{array}{\|r\|} 15 \\ 1 \end{array}$ | $\begin{array}{r} 9 \\ 5^{2} \end{array}$ |  |
| 10 | 5 | $\begin{array}{r} 24 \\ 1 \end{array}$ | $\begin{array}{r} 11 \\ 2 \end{array}$ | $\begin{array}{\|l\|} \hline 29 \\ 34 \\ \hline \end{array}$ | $\begin{aligned} & 15 \\ & 33 \end{aligned}$ | 6 | $\begin{array}{r} 26 \\ 1 \end{array}$ | $\begin{array}{r} 42 \\ 2 \end{array}$ | $\begin{aligned} & 55 \\ & 28 \end{aligned}$ | $\begin{array}{r} 42 \\ 2 \end{array}$ | 7 | $\begin{array}{r} 29 \\ 1 \end{array}$ | $2$ | $\begin{aligned} & 18 \\ & 20 \end{aligned}$ | $\begin{array}{r} 4 \\ 23 \\ \hline \end{array}$ | 8 | $3_{1}^{1}$ | $\begin{array}{r} 23 \\ 2 \end{array}$ | $\begin{aligned} & 27 \\ & 11 \end{aligned}$ | $\begin{aligned} & 56 \\ & 36 \end{aligned}$ | 9 | $33$ | $\begin{array}{r} 30 \\ 20 \end{array}$ | $\begin{array}{r} 17 \\ \hline 1 \end{array}$ | $\begin{array}{\|r} 1 \\ 40 \\ \hline \end{array}$ |  |
| 11 |  | $\left.\begin{array}{r} 25 \\ 1 \end{array} \right\rvert\,$ | $\begin{array}{r} 14 \\ 2 \end{array}$ | $\begin{array}{\|r} 3 \\ 34 \\ \hline \end{array}$ | $\begin{aligned} & 48 \\ & 26 \end{aligned}$ |  | $\begin{array}{r} 27 \\ 1 \end{array}$ | $\begin{array}{r} 45 \\ 2 \end{array}$ | $\begin{array}{\|l} 23 \\ 27 \end{array}$ | $\begin{aligned} & 44 \\ & 55 \\ & \hline \end{aligned}$ |  | $\underset{1}{30}$ | $\begin{aligned} & 9 \\ & 2 \end{aligned}$ | $\begin{aligned} & 3^{8} \\ & 20 \end{aligned}$ | $\begin{array}{\|l} 27 \\ 15 \end{array}$ |  | $\begin{array}{r} 32 \\ 1 \end{array}$ | $\begin{array}{r} 25 \\ 2 \end{array}$ | $\left\|\begin{array}{l} 39 \\ 11 \end{array}\right\|$ | $\begin{aligned} & \mathbf{3 2} \\ & \mathbf{2} 7 \\ & \hline \end{aligned}$ |  | $\begin{gathered} 34 \\ 1 \end{gathered}$ | $\begin{array}{r} 32 \\ 2 \\ \hline \end{array}$ | $\begin{array}{r} 18 \\ \hline 1 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline \mathbf{4 1} \\ \mathbf{3 1} \\ \hline \end{array}$ |  |
| 12 |  | $\begin{array}{r} 26 \\ 1 \end{array}$ | $\begin{array}{r} 16 \\ 2 \end{array}$ | $\begin{aligned} & 38 \\ & 34 \end{aligned}$ | $\begin{array}{\|l\|} \hline 14 \\ 21 \end{array}$ |  | $\begin{array}{r} 28 \\ 1 \end{array}$ | $\begin{array}{r} 47 \\ 2 \end{array}$ | $\begin{array}{\|l} \mathbf{5 1} \\ \mathbf{2 7} \end{array}$ | $\begin{aligned} & 39 \\ & 48 \end{aligned}$ |  | $\begin{array}{r} 31 \\ 1 \end{array}$ | $\begin{array}{r} 11 \\ 2 \end{array}$ | $\begin{aligned} & 58 \\ & 20 \end{aligned}$ | $\begin{array}{r} 42 \\ 7 \end{array}$ |  | $\begin{array}{r} 33 \\ 1 \end{array}$ | $\begin{array}{r} 27 \\ 2 \end{array}$ | $\begin{aligned} & 50 \\ & 11 \end{aligned}$ | $\begin{array}{\|l\|} \hline 59 \\ 17 \end{array}$ |  | $\begin{array}{r} 35 \\ 1 \end{array}$ | $34$ | $\begin{array}{r} 20 \\ 1 \end{array}$ | $\begin{array}{\|l} \hline 12 \\ 19 \\ \hline \end{array}$ |  |
| 13 |  | $\begin{array}{r} 27 \\ 1 \end{array}$ | $\begin{array}{r} 19 \\ \hline 2 \\ \hline \end{array}$ | $\begin{aligned} & 12 \\ & 34 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 35 \\ 15 \\ \hline \end{array}$ |  | $\begin{array}{r} 29 \\ 1 \end{array}$ | $\begin{array}{r} 50 \\ 2 \end{array}$ | $\begin{aligned} & 19 \\ & 27 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 27 \\ 4^{1} \\ \hline \end{array}$ |  | $\begin{array}{r} 32 \\ 1 \end{array}$ | $\begin{array}{r} 14 \\ 2 \end{array}$ | $\begin{aligned} & 18 \\ & 19 \end{aligned}$ | $\begin{aligned} & 49 \\ & 59 \end{aligned}$ |  | $\begin{gathered} 34 \\ 1 \end{gathered}$ | $\begin{array}{r} 30 \\ 20 \end{array}$ | $\begin{array}{r} 2 \\ 11 \end{array}$ | $\begin{array}{\|r} \hline 16 \\ \hline \end{array}$ |  | $\begin{gathered} 36 \\ 1 \end{gathered}$ | $\begin{array}{r} 36 \\ 2 \end{array}$ | $\begin{array}{r} 21 \\ \hline 1 \\ \hline \end{array}$ | $\begin{array}{\|r} \mathbf{3 1} \\ 9 \end{array}$ |  |
| 14 |  | $\begin{array}{r} 28 \\ 1 \end{array}$ | $\begin{array}{r} 21 \\ 2 \end{array}$ | $\begin{aligned} & 46 \\ & 34 \\ & \hline \end{aligned}$ | $\begin{array}{r} 50 \\ 9 \\ \hline \end{array}$ |  | $\begin{gathered} 30 \\ 1 \end{gathered}$ | $\begin{array}{r} 52 \\ 2 \end{array}$ | $\begin{array}{\|l} 47 \\ 27 \\ \hline \end{array}$ | $\begin{array}{r} 8 \\ 34 \\ \hline \end{array}$ |  | $\begin{array}{r} 33 \\ 1 \end{array}$ | $\begin{array}{r} 16 \\ 2 \\ \hline \end{array}$ | $\begin{aligned} & 38 \\ & 19 \end{aligned}$ | $\begin{aligned} & 48 \\ & 50 \end{aligned}$ |  | $\begin{array}{r} 35 \\ 1 \end{array}$ | $\begin{array}{r} 32 \\ 2 \end{array}$ | $\begin{array}{\|l\|} \hline 13 \\ 10 \end{array}$ | $\begin{array}{\|l\|} \hline 24 \\ 59 \\ \hline \end{array}$ |  | $\begin{array}{r} 37 \\ 1 \end{array}$ | $\begin{array}{r} 38 \\ 2 \end{array}$ | $\begin{array}{r} 22 \\ 0 \end{array}$ | $\begin{aligned} & \hline 40 \\ & 59 \\ & \hline \end{aligned}$ |  |
| 15 |  | $\begin{array}{r} 29 \\ \hline 1 \\ \hline \end{array}$ | $\begin{array}{r} 24 \\ 2 \end{array}$ | $\begin{array}{\|l\|} \hline 20 \\ 34 \\ \hline \end{array}$ | $\begin{array}{r} 59 \\ 2 \end{array}$ |  | $\begin{array}{r} 31 \\ 1 \end{array}$ | $\begin{array}{r} 55 \\ 2 \end{array}$ | $\begin{array}{\|l} \mathbf{1 4} \\ \mathbf{2 7} \\ \hline \end{array}$ | $\begin{array}{\|l} \mathbf{4}^{2} \\ \mathbf{2 7} \\ \hline \end{array}$ |  | $\begin{array}{r} 34 \\ 1 \end{array}$ | $\begin{array}{r} 18 \\ \hline 2 \\ \hline \end{array}$ | $\begin{aligned} & 58 \\ & 19 \end{aligned}$ | $\begin{aligned} & 38 \\ & 4^{2} \end{aligned}$ |  | $\begin{array}{r} 36 \\ 1 \end{array}$ | $\begin{array}{r} 34 \\ 2 \end{array}$ | $\begin{aligned} & 24 \\ & 10 \end{aligned}$ | $\begin{array}{\|l} 23 \\ 49 \\ \hline \end{array}$ |  | $38$ | $\begin{array}{r} 40 \\ 20 \end{array}$ | $\begin{array}{r} 23 \\ 0 \end{array}$ | $\begin{array}{\|l} \hline 39 \\ 48 \\ \hline \end{array}$ |  |
| 16 |  | $\begin{gathered} 30 \\ 1 \end{gathered}$ | $\begin{array}{r} 26 \\ 2 \end{array}$ | $\begin{aligned} & 55 \\ & 33 \end{aligned}$ | $\begin{array}{\|r} \mathbf{1} \\ 57 \\ \hline \end{array}$ |  | $\begin{array}{r} 32 \\ 1 \end{array}$ | $\begin{array}{r} 57 \\ 2 \end{array}$ | $\begin{array}{\|l} \mathbf{4}^{2} \\ \mathbf{2 7} \\ \hline \end{array}$ | $\begin{array}{r} 9 \\ 19 \\ \hline \end{array}$ |  | $\begin{array}{r} 35 \\ 1 \end{array}$ | $\begin{array}{r} 21 \\ 2 \end{array}$ | $\begin{aligned} & 18 \\ & 19 \end{aligned}$ | $\begin{aligned} & 20 \\ & 34 \end{aligned}$ |  | $\begin{array}{r} 37 \\ 1 \end{array}$ | $\begin{array}{r} 36 \\ 2 \end{array}$ | $\begin{array}{\|l\|} \hline 35 \\ 10 \end{array}$ | $\begin{aligned} & 12 \\ & 40 \end{aligned}$ |  | $\begin{array}{r} 39 \\ 1 \end{array}$ | $\begin{array}{r} 42 \\ 2 \end{array}$ | $\begin{array}{r} 24 \\ 0 \end{array}$ | $\begin{array}{\|l} 27 \\ 37 \\ \hline \end{array}$ |  |
| 17 |  | $\begin{array}{r} 31 \\ 1 \end{array}$ | $\begin{array}{r} 29 \\ 2 \end{array}$ | $\begin{aligned} & \mathbf{2 8} \\ & 33 \end{aligned}$ | $\begin{array}{\|l\|} \hline 58 \\ 51 \\ \hline \end{array}$ |  | $\begin{array}{r} 34 \\ 1 \end{array}$ | $\begin{aligned} & 0 \\ & 2 \end{aligned}$ | $\begin{array}{r} 9 \\ 27 \end{array}$ | $\begin{aligned} & 28 \\ & 12 \end{aligned}$ |  | $\begin{array}{r} 36 \\ 1 \end{array}$ | $\begin{array}{r} 23 \\ 2 \end{array}$ | $\begin{aligned} & 37 \\ & 19 \\ & \hline \end{aligned}$ | $\begin{aligned} & 54 \\ & 26 \end{aligned}$ |  | $\begin{array}{r} 38 \\ 1 \end{array}$ | $\begin{array}{r} 38 \\ 2 \end{array}$ | $\begin{array}{\|l\|} \hline 45 \\ 10 \end{array}$ | $\begin{aligned} & 52 \\ & 30 \end{aligned}$ |  | $\begin{array}{r} 40 \\ 1 \end{array}$ | $\begin{array}{r} 44 \\ 2 \end{array}$ | $\begin{array}{r} 25 \\ 0 \end{array}$ | $\begin{array}{r} 4 \\ 27 \\ \hline \end{array}$ |  |
| 18 |  | $\begin{gathered} 32 \\ 1 \end{gathered}$ | $\begin{array}{r} 32 \\ 2 \end{array}$ | $\begin{array}{r} 2 \\ 33 \end{array}$ | $\begin{aligned} & 49 \\ & 44 \end{aligned}$ |  | $\begin{array}{r} 35 \\ 1 \end{array}$ | $\begin{aligned} & 2 \\ & 2 \end{aligned}$ | $\begin{aligned} & 3^{6} \\ & 27 \end{aligned}$ | $\begin{array}{r} 40 \\ 5 \\ \hline \end{array}$ |  | $\begin{array}{r} 37 \\ 1 \end{array}$ | $\begin{array}{r} 25 \\ 2 \end{array}$ | $\begin{array}{\|l} 57 \\ 19 \end{array}$ | $\begin{aligned} & 20 \\ & 17 \end{aligned}$ |  | $\left[\begin{array}{c} 39 \\ 1 \end{array}\right.$ | $\begin{array}{r} 40 \\ 2 \end{array}$ | $\begin{aligned} & 56 \\ & 10 \end{aligned}$ | $\begin{aligned} & 22 \\ & 21 \end{aligned}$ |  | $\begin{gathered} 41 \\ 1 \end{gathered}$ | $\begin{array}{r} 46 \\ 2 \end{array}$ | $\begin{array}{r} 25 \\ 0 \end{array}$ | $\begin{aligned} & \mathbf{3 1} \\ & 16 \end{aligned}$ |  |
| 19 |  | $\begin{array}{r} 33 \\ 1 \end{array}$ | $\begin{array}{r} 34 \\ 2 \end{array}$ | $\begin{aligned} & \mathbf{3 6} \\ & 33 \end{aligned}$ | $\begin{array}{\|l\|} \hline 33 \\ 39 \\ \hline \end{array}$ |  | $\begin{array}{r} 36 \\ 1 \end{array}$ | $\begin{aligned} & 5 \\ & 2 \end{aligned}$ | $\begin{array}{r} 3 \\ 26 \end{array}$ | $\begin{aligned} & 45 \\ & 58 \\ & \hline \end{aligned}$ |  | $\begin{array}{r} 38 \\ 1 \end{array}$ | $\begin{array}{r} 28 \\ 2 \end{array}$ | $\begin{aligned} & 16 \\ & 19 \end{aligned}$ | $\begin{array}{r} 37 \\ 8 \end{array}$ |  | $40$ | $\begin{array}{r} 43 \\ 2 \end{array}$ | $\begin{array}{r} 6 \\ 10 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 43 \\ 11 \end{array}$ |  | $\begin{array}{r} 42 \\ 1 \end{array}$ | $48$ | $\begin{gathered} 25 \\ \hline 0 \end{gathered}$ | $\begin{array}{r} 47 \\ \hline \end{array}$ |  |
| 20 | 5 | $\left[\begin{array}{c} 34 \\ 1 \end{array}\right.$ | $\begin{array}{r} 37 \\ 2 \end{array}$ | $\begin{array}{\|l} \mathbf{1 0} \\ 33 \end{array}$ | $\begin{aligned} & 12 \\ & 32 \end{aligned}$ | 6 | $\begin{array}{r} 37 \\ 1 \end{array}$ | $\begin{aligned} & 7 \\ & 2 \end{aligned}$ | $\begin{aligned} & 30 \\ & 26 \end{aligned}$ | $\begin{array}{\|l} 43 \\ 5^{1} \\ \hline \end{array}$ | 7 | $\begin{array}{\|r} 39 \\ 1 \end{array}$ | $\begin{array}{r} 30 \\ 2 \end{array}$ | $\begin{array}{\|l} 35 \\ 19 \\ \hline \end{array}$ | $\begin{array}{r} 45 \\ 1 \end{array}$ | 8 | $\begin{gathered} 41 \\ 1 \end{gathered}$ | $\begin{array}{r} 45 \\ 2 \end{array}$ | $\begin{aligned} & 16 \\ & 10 \end{aligned}$ | $\begin{gathered} 54 \\ 1 \end{gathered}$ | 9 | $\begin{gathered} 43 \\ 1 \end{gathered}$ | $\underset{1}{50}$ | $\begin{aligned} & 25 \\ & 59 \end{aligned}$ | $\begin{array}{\|l} 53 \\ 55 \\ \hline \end{array}$ |  |
| 21 |  | $\left.\begin{array}{r} 35 \\ 1 \end{array} \right\rvert\,$ | $\left\lvert\, \begin{gathered} 39 \\ 2 \end{gathered}\right.$ | $\begin{aligned} & 43 \\ & 33 \\ & \hline \end{aligned}$ | $\begin{aligned} & 44 \\ & 26 \end{aligned}$ |  | $\begin{array}{r} 38 \\ 1 \end{array}$ | $\begin{aligned} & 9 \\ & 2 \end{aligned}$ | $\begin{aligned} & 57 \\ & 26 \end{aligned}$ | $\begin{array}{\|l} 34 \\ 43 \\ \hline \end{array}$ |  | $\begin{array}{r} 40 \\ 1 \end{array}$ | $\begin{array}{r} 32 \\ 2 \end{array}$ | $\begin{aligned} & 54 \\ & 18 \end{aligned}$ | $\begin{aligned} & 46 \\ & 5^{2} \end{aligned}$ |  | $42$ | $\begin{array}{r} 47 \\ 2 \end{array}$ | $\begin{array}{\|r} \hline 26 \\ 9 \\ \hline \end{array}$ | $\begin{aligned} & 55 \\ & 53 \\ & \hline \end{aligned}$ |  | $44$ | $\begin{array}{r} 52 \\ 1 \end{array}$ | $\begin{aligned} & 25 \\ & 59 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 48 \\ 44 \\ \hline \end{array}$ |  |
| 22 |  | $\begin{array}{r} 36 \\ 1 \end{array}$ | $\begin{array}{r} 42 \\ 2 \end{array}$ | $17$ | $\begin{aligned} & 10 \\ & 21 \end{aligned}$ |  | $\begin{array}{\|r} 39 \\ 1 \end{array}$ | $\begin{array}{r} 12 \\ 2 \end{array}$ | $\begin{aligned} & 24 \\ & 26 \end{aligned}$ | $\begin{aligned} & \mathbf{1 7} \\ & 3^{6} \end{aligned}$ |  | $\begin{array}{r} 41 \\ 1 \end{array}$ | $\begin{array}{r} 35 \\ 2 \end{array}$ | $\begin{aligned} & 13 \\ & 18 \end{aligned}$ | $\begin{aligned} & 38 \\ & 43 \end{aligned}$ |  | $\begin{array}{r} 43 \\ 1 \end{array}$ | $\begin{array}{r} 49 \\ 2 \end{array}$ | $\begin{array}{r} 36 \\ 9 \end{array}$ | $\begin{aligned} & 48 \\ & 42 \end{aligned}$ |  | $\begin{array}{r} 45 \\ 1 \end{array}$ | $\begin{gathered} 54 \\ 1 \end{gathered}$ | $\begin{array}{\|l} \hline \mathbf{2 5} \\ 59 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline \mathbf{3 2} \\ 34 \\ \hline \end{array}$ |  |
| 23 |  | $\left\|\begin{array}{r} 37 \\ 1 \end{array}\right\|$ | $\begin{gathered} 44 \\ 2 \end{gathered}$ | $\begin{aligned} & 50 \\ & 33 \end{aligned}$ | $\begin{array}{\|l} \mathbf{3 1} \\ \mathbf{1 3} \\ \hline \end{array}$ |  | $\begin{gathered} 40 \\ 1 \end{gathered}$ | $\begin{array}{r} 14 \\ 2 \end{array}$ | $\left\lvert\, \begin{aligned} & 50 \\ & 26 \end{aligned}\right.$ | $\begin{array}{\|l} 53 \\ 29 \end{array}$ |  | $42$ | $\begin{array}{r} 37 \\ 2 \end{array}$ | $\begin{aligned} & 32 \\ & 18 \end{aligned}$ | $\begin{array}{\|l} \mathbf{2 1} \\ 35 \\ \hline \end{array}$ |  | $44$ | $\begin{array}{r} 51 \\ 2 \end{array}$ | $\begin{array}{r} 46 \\ 9 \end{array}$ | $\begin{aligned} & 30 \\ & 33 \\ & \hline \end{aligned}$ |  | $\begin{array}{r} 46 \\ 1 \end{array}$ | $\begin{array}{r} 56 \\ 1 \end{array}$ | $\begin{aligned} & 25 \\ & 59 \\ & \hline \end{aligned}$ | $\begin{array}{r} 6 \\ 22 \end{array}$ |  |
| 24 |  | $\begin{gathered} 38 \\ 1 \end{gathered}$ | $\begin{array}{r} 47 \\ 2 \end{array}$ | $\begin{aligned} & 23 \\ & 33 \end{aligned}$ | $\begin{array}{r} 44 \\ 8 \end{array}$ |  | $\begin{array}{r} 41 \\ 1 \end{array}$ | $\begin{array}{r} 17 \\ 2 \end{array}$ | $\begin{aligned} & 17 \\ & 26 \end{aligned}$ | $\begin{array}{\|l} 22 \\ 21 \end{array}$ |  | $\begin{array}{r} 43 \\ 1 \end{array}$ | $\begin{array}{r} 39 \\ 2 \end{array}$ | $\begin{aligned} & 50 \\ & 18 \end{aligned}$ | $\begin{aligned} & 56 \\ & 26 \end{aligned}$ |  | $\begin{gathered} 45 \\ 1 \end{gathered}$ | $\begin{array}{r} 53 \\ 2 \end{array}$ | $\begin{array}{r} 56 \\ 9 \\ \hline \end{array}$ | $\begin{array}{r} 3 \\ 23 \\ \hline \end{array}$ |  | $\begin{array}{r} 47 \\ 1 \end{array}$ | $\begin{array}{\|c} 58 \\ 1 \end{array}$ | $\begin{array}{\|l} 24 \\ 59 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 28 \\ 12 \end{array}$ |  |
| 25 |  | $\begin{array}{r} 39 \\ 1 \\ \hline \end{array}$ | $\begin{array}{r} 49 \\ 2 \end{array}$ | $\begin{aligned} & \hline 56 \\ & 33 \\ & \hline \end{aligned}$ | $\begin{gathered} 52 \\ 2 \end{gathered}$ |  | $\begin{array}{r} 42 \\ 1 \end{array}$ | $\begin{array}{r} 19 \\ 2 \end{array}$ | $\begin{aligned} & 43 \\ & 26 \end{aligned}$ | $\begin{aligned} & 43 \\ & 14 \end{aligned}$ |  | $\begin{array}{r} 44 \\ 1 \end{array}$ | $\begin{array}{r} 42 \\ 2 \end{array}$ | $\begin{array}{r} 9 \\ 18 \\ \hline \end{array}$ | $\begin{array}{\|l} 22 \\ 18 \end{array}$ |  | $\begin{gathered} 46 \\ 1 \end{gathered}$ | $\begin{array}{r} 56 \\ 2 \end{array}$ | $\begin{aligned} & 5 \\ & 9 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 26 \\ 14 \\ \hline \end{array}$ |  | $\begin{array}{r} 49 \\ 1 \end{array}$ | $\begin{aligned} & 0 \\ & 1 \end{aligned}$ | $\begin{array}{\|l} \hline 23 \\ 59 \\ \hline \end{array}$ | $\begin{gathered} 40 \\ 1 \end{gathered}$ |  |
| 26 |  | $\left.\begin{array}{r} 40 \\ 1 \end{array} \right\rvert\,$ | $\begin{array}{r} 52 \\ 2 \end{array}$ | $\begin{aligned} & 29 \\ & 32 \\ & \hline \end{aligned}$ | $\begin{array}{\|c\|} \hline 54 \\ 55 \\ \hline \end{array}$ |  | $\begin{array}{r} 43 \\ 1 \end{array}$ | $\begin{array}{r} 22 \\ 2 \end{array}$ | $\begin{array}{r} 9 \\ 26 \end{array}$ | $\begin{array}{\|r} 57 \\ 7 \\ \hline \end{array}$ |  | $\begin{array}{r} 45 \\ 1 \end{array}$ | $\begin{array}{r} 44 \\ 2 \end{array}$ | $\begin{aligned} & 27 \\ & 18 \end{aligned}$ | $\begin{aligned} & 40 \\ & 10 \end{aligned}$ |  | $\begin{array}{r} 47 \\ 1 \end{array}$ | $\begin{array}{r} 58 \\ 2 \end{array}$ | $\begin{array}{\|r\|} \hline 14 \\ 9 \\ \hline \end{array}$ | $\begin{array}{r} 40 \\ 4 \\ \hline \end{array}$ |  | $\begin{gathered} 50 \\ 1 \end{gathered}$ | $2$ | $\begin{aligned} & 22 \\ & 58 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 41 \\ 51 \\ \hline \end{array}$ |  |
| 27 |  | $\begin{array}{r} 41 \\ 1 \end{array}$ | $\begin{array}{r} 55 \\ 25 \end{array}$ | $\begin{array}{r} 2 \\ 3^{2} \\ \hline \end{array}$ | $\begin{array}{\|l} 49 \\ 49 \\ \hline \end{array}$ |  | $\begin{gathered} 44 \\ 1 \end{gathered}$ | $\begin{array}{r} 24 \\ 2 \end{array}$ | $\begin{aligned} & 36 \\ & 25 \end{aligned}$ | $\begin{array}{r} 4 \\ 59 \\ \hline \end{array}$ |  | $\begin{array}{r} 46 \\ 1 \end{array}$ | $\begin{array}{r} 46 \\ 2 \end{array}$ | $\begin{aligned} & 45 \\ & 18 \end{aligned}$ | $\begin{gathered} 50 \\ 1 \end{gathered}$ |  | $\begin{array}{r} 49 \\ 1 \end{array}$ | $\begin{aligned} & \hline \mathbf{0} \\ & 2 \end{aligned}$ | $\begin{array}{r} 23 \\ 8 \end{array}$ | $\begin{array}{\|l\|} \hline 44 \\ 54 \\ \hline \end{array}$ |  | $51$ | $\begin{aligned} & 4 \\ & 1 \end{aligned}$ | $\begin{array}{\|l\|} \hline 21 \\ 58 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 32 \\ 40 \\ \hline \end{array}$ |  |
| 28 |  | $\begin{gathered} 42 \\ 1 \end{gathered}$ | $\begin{array}{r} 57 \\ 2 \end{array}$ | $\begin{array}{\|l} 35 \\ 3^{2} \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 38 \\ 43 \\ \hline \end{array}$ |  | $\begin{array}{r} 45 \\ 1 \end{array}$ | $\begin{array}{r} 27 \\ 2 \end{array}$ | $\begin{array}{r} 2 \\ 25 \\ \hline \end{array}$ | $\begin{array}{r} 3 \\ 5^{2} \\ \hline \end{array}$ |  | $\begin{array}{r} 47 \\ 1 \end{array}$ | $\begin{array}{r} 49 \\ 2 \end{array}$ | $\begin{array}{\|r} 3 \\ 17 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 5^{1} \\ 52 \\ \hline \end{array}$ |  | $\begin{gathered} 50 \\ 1 \end{gathered}$ | $\begin{aligned} & 2 \\ & 2 \end{aligned}$ | $\begin{array}{r} 32 \\ 8 \end{array}$ | $\begin{array}{\|l\|} \hline 3^{8} \\ 45 \\ \hline \end{array}$ |  | $\begin{array}{r} 52 \\ 1 \end{array}$ | 6 | $\begin{aligned} & 20 \\ & 58 \\ & \hline \end{aligned}$ | $\begin{aligned} & 12 \\ & 28 \end{aligned}$ |  |
| 29 |  | $\left[\left.\begin{array}{c} 44 \\ 1 \end{array} \right\rvert\,\right.$ | $\begin{aligned} & 0 \\ & 2 \end{aligned}$ | $\begin{array}{r} 8 \\ 3^{2} \end{array}$ | $\begin{array}{\|l} \mathbf{2 1} \\ 36 \\ \hline \end{array}$ |  | $\begin{array}{r} 46 \\ 1 \end{array}$ | $\begin{array}{r} 29 \\ 2 \end{array}$ | $\begin{array}{\|l} 27 \\ 25 \\ \hline \end{array}$ | $\begin{array}{\|l} 55 \\ 44 \\ \hline \end{array}$ |  | $\begin{array}{r} 48 \\ 1 \end{array}$ | $\begin{array}{\|r} 51 \\ 2 \end{array}$ | $\begin{array}{\|l\|} \mathbf{2 1} \\ 17 \\ \hline \end{array}$ | $\begin{array}{\|l} 43 \\ 44 \\ \hline \end{array}$ |  | $\left[\begin{array}{c} 51 \\ 1 \end{array}\right.$ | $\begin{aligned} & 4 \\ & 2 \end{aligned}$ | $\begin{array}{r} 41 \\ 8 \\ \hline \end{array}$ | $\begin{array}{\|l} 23 \\ 35 \\ \hline \end{array}$ |  | $\begin{array}{r} 53 \\ 1 \end{array}$ | $8$ | $\begin{aligned} & 18 \\ & 58 \end{aligned}$ | $\begin{aligned} & \hline 40 \\ & 18 \end{aligned}$ |  |
| 30 | 5 | $\left[\begin{array}{c} 45 \\ 1 \end{array}\right.$ | $\begin{aligned} & 2 \\ & 2 \end{aligned}$ | $\begin{aligned} & 40 \\ & 32 \end{aligned}$ | $\begin{aligned} & 57 \\ & 30 \\ & \hline \end{aligned}$ | 6 | $\begin{array}{\|r} 47 \\ 1 \end{array}$ | $\begin{array}{r} 31 \\ 2 \end{array}$ | $\begin{array}{\|l} 53 \\ 25 \end{array}$ | $\begin{array}{\|l} 39 \\ 37 \\ \hline \end{array}$ | 7 | $\begin{array}{r} 49 \\ 1 \end{array}$ | $\begin{array}{r} 53 \\ 2 \end{array}$ | $\begin{array}{\|l} 39 \\ 17 \\ \hline \end{array}$ | $\begin{aligned} & 27 \\ & 35 \\ & \hline \end{aligned}$ | 8 | $\begin{array}{r} 52 \\ 1 \end{array}$ | $6$ | $\begin{array}{r} 49 \\ 8 \end{array}$ | $\begin{aligned} & 58 \\ & 25 \\ & \hline \end{aligned}$ | 9 | $\begin{gathered} 54 \\ 1 \end{gathered}$ | $\begin{array}{r} 10 \\ 1 \end{array}$ | $\begin{aligned} & 16 \\ & 58 \end{aligned}$ | $58$ |  |

Bürgi's 1' sine table (reconstruction, D. Roegel, 2016)

| 1 | $5^{\circ}$ |  |  |  |  | $6^{\circ}$ |  |  |  |  | $7^{\circ}$ |  |  |  |  | $8^{\circ}$ |  |  |  |  | $9^{\circ}$ |  |  |  |  | , |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 30 | 5 | $\begin{array}{r} 45 \\ 1 \end{array}$ | $\begin{aligned} & 2 \\ & 2 \end{aligned}$ | $\begin{aligned} & 40 \\ & 32 \end{aligned}$ | $\begin{aligned} & 57 \\ & 30 \\ & \hline \end{aligned}$ | 6 | $\begin{array}{r} 47 \\ 1 \end{array}$ | $\begin{array}{r} 31 \\ 2 \end{array}$ | $\begin{aligned} & 53 \\ & 25 \\ & \hline \end{aligned}$ | $\begin{aligned} & 39 \\ & 37 \\ & \hline \end{aligned}$ | 7 | $\begin{array}{r} 49 \\ 1 \end{array}$ | $\begin{array}{\|r} 53 \\ 2 \end{array}$ | $\begin{aligned} & 39 \\ & 17 \end{aligned}$ | $\begin{array}{\|l\|} \hline \mathbf{2 7} \\ 35 \\ \hline \end{array}$ | 8 | $\begin{array}{r} 52 \\ 1 \end{array}$ | $\begin{aligned} & 6 \\ & 2 \end{aligned}$ | $\begin{array}{r} 49 \\ 8 \end{array}$ | $\begin{aligned} & 58 \\ & 25 \end{aligned}$ | 9 | $\begin{array}{r} 54 \\ 1 \end{array}$ | $\begin{array}{r} 10 \\ 1 \end{array}$ | $\begin{array}{\|l\|} \hline 16 \\ 58 \\ \hline \end{array}$ | $5^{8}$ | 30 |
| 31 |  | $\begin{array}{r} 46 \\ 1 \end{array}$ | $5$ | $\begin{aligned} & 13 \\ & 3^{2} \\ & \hline \end{aligned}$ | $\begin{aligned} & 27 \\ & 24 \\ & \hline \end{aligned}$ |  | $48$ | $\begin{array}{r} 34 \\ 2 \end{array}$ | $\begin{aligned} & 19 \\ & 25 \\ & \hline \end{aligned}$ | $\begin{aligned} & 16 \\ & 29 \end{aligned}$ |  | $\begin{array}{r} 50 \\ 1 \end{array}$ | $\begin{array}{r} 55 \\ 2 \end{array}$ | $\begin{array}{\|l\|} \hline 57 \\ 17 \\ \hline \end{array}$ | $\begin{array}{\|r} \hline 2 \\ 27 \\ \hline \end{array}$ |  | $53$ | $\begin{aligned} & 8 \\ & 2 \end{aligned}$ | $\begin{array}{r} 58 \\ 8 \end{array}$ | $\begin{aligned} & 23 \\ & 16 \end{aligned}$ |  | 55 1 | 12 | $\begin{array}{\|l} \hline 15 \\ 57 \\ \hline \end{array}$ | $\begin{array}{\|r} \hline 5 \\ 57 \\ \hline \end{array}$ | 31 |
| $3^{2}$ |  | $\begin{array}{r} 47 \\ \hline 1 \end{array}$ | $\begin{aligned} & 7 \\ & 2 \end{aligned}$ | $\begin{aligned} & 45 \\ & 32 \end{aligned}$ | $\begin{aligned} & 51 \\ & 18 \end{aligned}$ |  | $\begin{array}{r} 49 \\ 1 \end{array}$ | $\begin{array}{r} 36 \\ 2 \end{array}$ | $\begin{aligned} & 44 \\ & 25 \\ & \hline \end{aligned}$ | $\begin{aligned} & 45 \\ & 22 \end{aligned}$ |  | $\begin{array}{r} 5^{1} \\ 1 \end{array}$ | $\begin{array}{r} 58 \\ 2 \end{array}$ | $\begin{aligned} & \hline \mathbf{1 4} \\ & 17 \\ & \hline \end{aligned}$ | $\begin{aligned} & 29 \\ & 18 \end{aligned}$ |  | $54$ | $\begin{array}{r} 11 \\ 2 \end{array}$ | $\begin{aligned} & \hline 6 \\ & 8 \end{aligned}$ | $\begin{array}{r} 39 \\ \hline \end{array}$ |  | $\begin{gathered} 56 \\ 1 \end{gathered}$ | $\begin{array}{\|r\|} \hline 14 \\ 1 \end{array}$ | $13$ | $\begin{array}{r} \mathbf{2} \\ 45 \\ \hline \end{array}$ | 32 |
| 33 |  | $\begin{array}{r} 48 \\ 1 \end{array}$ | $\begin{array}{r} 10 \\ \hline 2 \\ \hline \end{array}$ | $\begin{aligned} & 18 \\ & 32 \\ & \hline \end{aligned}$ | $\begin{array}{r} 9 \\ 11 \\ \hline \end{array}$ |  | $\begin{gathered} 50 \\ 1 \end{gathered}$ | $\begin{array}{r} 39 \\ 2 \end{array}$ | $\begin{array}{\|l} \hline 10 \\ 25 \\ \hline \end{array}$ | $\begin{array}{r} 7 \\ 15 \\ \hline \end{array}$ |  | $53$ | $\begin{aligned} & 0 \\ & 2 \end{aligned}$ | $\begin{aligned} & \mathbf{3 1} \\ & 17 \\ & \hline \end{aligned}$ | $\begin{array}{r} 47 \\ 9 \\ \hline \end{array}$ |  | $55$ | $\begin{array}{\|r} 13 \\ 2 \end{array}$ | $\begin{array}{\|r} 14 \\ 7 \\ \hline \end{array}$ | $\begin{aligned} & 45 \\ & 56 \\ & \hline \end{aligned}$ |  | $\begin{array}{r} 57 \\ 1 \end{array}$ | $\begin{array}{r} 16 \\ 1 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 10 \\ 57 \\ \hline \end{array}$ | $\begin{aligned} & 47 \\ & 34 \\ & \hline \end{aligned}$ | 33 |
| 34 |  | $\begin{gathered} 49 \\ 1 \end{gathered}$ | $\begin{array}{r} 12 \\ 2 \end{array}$ | $\begin{aligned} & 50 \\ & 32 \\ & \hline \end{aligned}$ | $\begin{array}{r} 20 \\ 5 \\ \hline \end{array}$ |  | $\underset{1}{51}$ | $\begin{array}{r} 41 \\ 2 \end{array}$ | $\begin{array}{\|l} 35 \\ 25 \\ \hline \end{array}$ | $\begin{array}{\|r} 22 \\ 7 \\ \hline \end{array}$ |  | $\begin{array}{\|c} 54 \\ 1 \end{array}$ | $\begin{aligned} & 2 \\ & 2 \end{aligned}$ | $\begin{aligned} & 48 \\ & 17 \\ & \hline \end{aligned}$ | $\begin{gathered} 56 \\ 1 \end{gathered}$ |  | $\begin{gathered} 56 \\ 1 \end{gathered}$ | $\begin{array}{r} 15 \\ 2 \end{array}$ | $\begin{array}{\|r} 22 \\ 7 \\ \hline \end{array}$ | $\begin{array}{\|l} \mathbf{4 1} \\ 46 \\ \hline \end{array}$ |  | $\begin{gathered} 58 \\ 1 \end{gathered}$ | $\begin{array}{r} 18 \\ 1 \end{array}$ | $\begin{array}{\|r} \hline 8 \\ 57 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 21 \\ 24 \\ \hline \end{array}$ | 34 |
| 35 |  | $\begin{array}{r} 50 \\ 1 \\ \hline \end{array}$ | $\begin{array}{\|r\|} \hline 15 \\ 2 \\ \hline \end{array}$ | $\begin{aligned} & 22 \\ & 31 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 25 \\ 58 \\ \hline \end{array}$ |  | $52$ | $\begin{array}{\|c\|} \hline 44 \\ 2 \end{array}$ | $\begin{array}{r} \mathbf{0} \\ 24 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 29 \\ 59 \\ \hline \end{array}$ |  | $\begin{array}{\|r} 55 \\ 1 \\ \hline \end{array}$ | $\begin{aligned} & \hline 5 \\ & 2 \\ & \hline \end{aligned}$ | $\begin{array}{\|r\|} \hline 5 \\ 16 \\ \hline \end{array}$ | $\begin{aligned} & 57 \\ & 52 \\ & \hline \end{aligned}$ |  | $\begin{array}{\|r} 57 \\ \hline 1 \\ \hline \end{array}$ | $\begin{array}{\|r} 17 \\ \hline \end{array}$ | $\begin{array}{\|r} \hline 30 \\ 7 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 27 \\ 36 \\ \hline \end{array}$ |  | $\begin{array}{\|r} 59 \\ 1 \\ \hline \end{array}$ | 20 1 | $\begin{array}{\|r} \mathbf{5} \\ 57 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 45 \\ 12 \\ \hline \end{array}$ | 35 |
| 36 |  | $\begin{array}{r} 51 \\ 1 \end{array}$ | $\begin{array}{r} 17 \\ 2 \end{array}$ | $\begin{aligned} & 54 \\ & 31 \\ & \hline \end{aligned}$ | $\begin{aligned} & 23 \\ & 5^{2} \end{aligned}$ |  | $\begin{array}{r} 53 \\ 1 \end{array}$ | $\begin{array}{r} 46 \\ 2 \end{array}$ | $\begin{aligned} & 25 \\ & 24 \end{aligned}$ | $\begin{aligned} & 28 \\ & 52 \end{aligned}$ |  | $\begin{array}{r} 56 \\ 1 \end{array}$ | $\begin{aligned} & 7 \\ & 2 \end{aligned}$ | $\begin{aligned} & 22 \\ & 16 \end{aligned}$ | $\begin{aligned} & 49 \\ & 43 \\ & \hline \end{aligned}$ |  | $\begin{array}{r} 58 \\ 1 \end{array}$ | $\begin{array}{r} 19 \\ 2 \end{array}$ | $\begin{array}{r} 38 \\ \hline 7 \\ \hline \end{array}$ | $\begin{array}{r} 3 \\ 27 \\ \hline \end{array}$ | 10 | $\begin{aligned} & \hline 0 \\ & 1 \\ & \hline \end{aligned}$ | $\begin{array}{r} 22 \\ 1 \end{array}$ | $\begin{array}{\|r} \hline \mathbf{2} \\ 57 \\ \hline \end{array}$ | $\begin{array}{r} 57 \\ \hline 2 \end{array}$ | 36 |
| 37 |  | $\begin{array}{r} 52 \\ 1 \end{array}$ | $\begin{array}{r} 20 \\ 2 \end{array}$ | $\begin{aligned} & 26 \\ & 31 \end{aligned}$ | $\begin{aligned} & 15 \\ & 45 \\ & \hline \end{aligned}$ |  | $54$ | $\begin{array}{r} 48 \\ 2 \end{array}$ | $\begin{aligned} & 50 \\ & 24 \end{aligned}$ | $\begin{aligned} & 20 \\ & 44 \end{aligned}$ |  | $\begin{array}{\|r} 57 \\ 1 \end{array}$ | $\begin{aligned} & 9 \\ & 2 \end{aligned}$ | $\begin{array}{l\|} \hline 39 \\ 16 \end{array}$ | $\begin{aligned} & \mathbf{3 2}^{2} \\ & 35 \end{aligned}$ |  | $\begin{array}{\|r} \hline 59 \\ 1 \end{array}$ | $\begin{array}{r} 21 \\ 2 \end{array}$ | $\begin{array}{r} 45 \\ 7 \end{array}$ | $\begin{aligned} & 30 \\ & 16 \end{aligned}$ |  | 1 | $\begin{array}{r} 23 \\ 1 \end{array}$ | $\begin{array}{r} 59 \\ 56 \\ \hline \end{array}$ | $\begin{aligned} & 59 \\ & 51 \\ & \hline \end{aligned}$ | 37 |
| $3^{8}$ |  | $\begin{array}{r} 53 \\ 1 \end{array}$ | $\begin{array}{r} 22 \\ 2 \end{array}$ | $\begin{aligned} & 58 \\ & 31 \\ & \hline \end{aligned}$ | $\begin{array}{r} \mathbf{0} \\ 39 \\ \hline \end{array}$ |  | $\begin{array}{r} 55 \\ 1 \end{array}$ | $\begin{array}{r} 51 \\ 2 \end{array}$ | $\begin{aligned} & 15 \\ & 24 \\ & \hline \end{aligned}$ | $\begin{array}{r} 4 \\ 37 \\ \hline \end{array}$ |  | $\begin{array}{r} 58 \\ 1 \end{array}$ | $\begin{array}{r} 11 \\ 2 \end{array}$ | $\begin{aligned} & 56 \\ & 16 \end{aligned}$ | $\begin{array}{r} 7 \\ 26 \end{array}$ | 9 | $0$ | $\begin{array}{r} 23 \\ 2 \end{array}$ | $\begin{array}{r} 52 \\ \hline \\ \hline \end{array}$ | $\begin{array}{r} 46 \\ \hline \\ \hline \end{array}$ |  | 2 1 | $\begin{array}{r} 25 \\ 1 \end{array}$ | $\begin{array}{\|l} \hline 56 \\ 56 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 50 \\ 39 \\ \hline \end{array}$ | $3^{8}$ |
| 39 |  | $\begin{array}{r} 54 \\ 1 \end{array}$ | $\begin{array}{r} 25 \\ 2 \end{array}$ | $\begin{aligned} & 29 \\ & 31 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 39 \\ 33 \\ \hline \end{array}$ |  | $\begin{array}{r} 56 \\ 1 \\ \hline \end{array}$ | $\begin{array}{r} 53 \\ 2 \end{array}$ | $\begin{aligned} & 39 \\ & 24 \\ & \hline \end{aligned}$ | $\begin{aligned} & 41 \\ & 29 \\ & \hline \end{aligned}$ |  | $\begin{array}{r} 59 \\ 1 \end{array}$ | $\begin{array}{r} 14 \\ 2 \end{array}$ | $\begin{array}{\|l} \hline 12 \\ 16 \\ \hline \end{array}$ | $\begin{array}{\|l} 33 \\ 17 \\ \hline \end{array}$ |  | 1 | $\begin{array}{r} 25 \\ 2 \end{array}$ | $\begin{array}{r} 59 \\ 6 \end{array}$ | $\begin{array}{\|l\|} \hline 53 \\ 57 \\ \hline \end{array}$ |  | $\begin{aligned} & 3 \\ & 1 \end{aligned}$ | $\begin{array}{r} 27 \\ 1 \end{array}$ | $\begin{array}{\|l} 53 \\ 56 \\ \hline \end{array}$ | $\begin{aligned} & 29 \\ & 29 \\ & \hline \end{aligned}$ | 39 |
| 40 | 5 | $\begin{array}{r} 55 \\ 1 \end{array}$ | $\begin{array}{r} 28 \\ 2 \end{array}$ | $\begin{array}{r} 1 \\ 31 \\ \hline \end{array}$ | $\begin{aligned} & 12 \\ & 26 \end{aligned}$ | 6 | $\begin{array}{r} 57 \\ 1 \end{array}$ | $\begin{array}{r} 56 \\ 2 \end{array}$ | $\begin{array}{r} 4 \\ 24 \\ \hline \end{array}$ | $\begin{aligned} & 10 \\ & 21 \end{aligned}$ | 8 | $0$ | $\begin{array}{r} 16 \\ 2 \end{array}$ | $\begin{aligned} & 28 \\ & 16 \end{aligned}$ | $\begin{array}{r} 50 \\ 8 \end{array}$ | 9 | 2 | $\begin{array}{r} 28 \\ 2 \end{array}$ | $\begin{aligned} & \hline 6 \\ & 6 \end{aligned}$ | $\begin{array}{\|l} \hline 50 \\ 47 \\ \hline \end{array}$ | 10 | $4$ | $\begin{array}{r} 29 \\ 1 \end{array}$ | $\begin{array}{\|l} 49 \\ 56 \\ \hline \end{array}$ | $\begin{aligned} & 58 \\ & 17 \end{aligned}$ | 40 |
| 41 |  | $\begin{array}{r} 56 \\ 1 \end{array}$ | $\begin{gathered} 30 \\ 2 \end{gathered}$ | $\begin{aligned} & 3^{2} \\ & 3^{1} \\ & \hline \end{aligned}$ | $\begin{aligned} & 38 \\ & 19 \\ & \hline \end{aligned}$ |  | $\begin{array}{r} 58 \\ 1 \end{array}$ | $\begin{array}{r} 58 \\ 2 \end{array}$ | $\begin{aligned} & 28 \\ & 24 \\ & \hline \end{aligned}$ | $\begin{aligned} & \hline 31 \\ & 14 \end{aligned}$ |  | $\begin{aligned} & \mathbf{1} \\ & \mathbf{1} \end{aligned}$ | $\begin{array}{r} 18 \\ 2 \end{array}$ | $\begin{aligned} & 44 \\ & 16 \end{aligned}$ | $\begin{gathered} 58 \\ 0 \end{gathered}$ |  | $\begin{aligned} & 3 \\ & 1 \end{aligned}$ | $\begin{array}{r} 30 \\ 2 \end{array}$ | $\begin{array}{r} 13 \\ 6 \end{array}$ | $\begin{array}{\|l} 37 \\ 37 \\ \hline \end{array}$ |  | $5$ | $\begin{array}{r} 31 \\ 1 \end{array}$ | $\begin{array}{\|l} \hline 4^{6} \\ 56 \\ \hline \end{array}$ | $\begin{array}{r} 15 \\ \hline 7 \end{array}$ | 41 |
| 42 |  | $\begin{array}{r} 57 \\ 1 \end{array}$ | $\begin{array}{r} 33 \\ 2 \end{array}$ | $\begin{array}{r} 3 \\ 31 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 57 \\ 13 \\ \hline \end{array}$ | 7 | $1$ | $2$ | $\begin{aligned} & 52 \\ & 24 \\ & \hline \end{aligned}$ | $\begin{array}{r} 45 \\ 6 \end{array}$ |  | $2$ | $\begin{array}{r} 21 \\ 2 \end{array}$ | $\begin{array}{\|r\|} \hline \mathbf{0} \\ 15 \\ \hline \end{array}$ | $\begin{aligned} & \hline 58 \\ & 50 \\ & \hline \end{aligned}$ |  | $\begin{aligned} & 4 \\ & 1 \end{aligned}$ | $\begin{array}{r} 3^{2} \\ 2 \end{array}$ | $\begin{array}{r} 20 \\ 6 \\ \hline \end{array}$ | $\begin{aligned} & \hline 14 \\ & 27 \\ & \hline \end{aligned}$ |  | 6 | $\begin{array}{r} 33 \\ 1 \end{array}$ | $\begin{aligned} & \hline \mathbf{4 2} \\ & 55 \\ & \hline \end{aligned}$ | $\begin{aligned} & 22 \\ & 55 \\ & \hline \end{aligned}$ | 42 |
| 43 |  | $\begin{array}{r} 58 \\ 1 \end{array}$ | $\begin{array}{r} 35 \\ 2 \end{array}$ | $\begin{aligned} & 35 \\ & 31 \\ & \hline \end{aligned}$ | $\begin{array}{r} 10 \\ \hline 7 \\ \hline \end{array}$ |  | $\begin{aligned} & 1 \\ & 1 \end{aligned}$ | $\begin{aligned} & 3 \\ & 2 \end{aligned}$ | $\begin{aligned} & 16 \\ & 23 \end{aligned}$ | $\begin{aligned} & \mathbf{5 1} \\ & 59 \end{aligned}$ |  | $\begin{aligned} & 3 \\ & 1 \end{aligned}$ | $\begin{array}{r} 23 \\ 2 \end{array}$ | $\begin{array}{\|l\|} \hline 16 \\ 15 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 4^{8} \\ 42 \\ \hline \end{array}$ |  | $5$ | $\begin{array}{r} 34 \\ 2 \end{array}$ | $\begin{array}{r} 26 \\ \hline 6 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{4 1} \\ & \mathbf{1 7} \\ & \hline \end{aligned}$ |  | $7$ | $\begin{array}{r} 35 \\ 1 \end{array}$ | $\begin{array}{\|l} \hline 38 \\ 55 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline \mathbf{1 7} \\ 44 \\ \hline \end{array}$ | 43 |
| 44 |  | $\begin{array}{r} 59 \\ 1 \end{array}$ | $\begin{array}{r} 38 \\ 2 \end{array}$ | $\begin{array}{r} 6 \\ 31 \\ \hline \end{array}$ | $\begin{array}{r} 17 \\ 0 \end{array}$ |  | $\begin{aligned} & 2 \\ & 1 \end{aligned}$ | $\begin{aligned} & 5 \\ & 2 \end{aligned}$ | $\begin{aligned} & 40 \\ & 23 \end{aligned}$ | $\begin{aligned} & 50 \\ & 50 \\ & \hline \end{aligned}$ |  | $\begin{aligned} & 4 \\ & 1 \end{aligned}$ | $\begin{array}{r} 25 \\ 2 \end{array}$ | $\begin{aligned} & 32 \\ & 15 \\ & \hline \end{aligned}$ | $\begin{aligned} & \mathbf{3 0} \\ & 33 \\ & \hline \end{aligned}$ |  | $6$ | $\begin{array}{r} 36 \\ 2 \end{array}$ | $\begin{array}{r} 32 \\ 6 \end{array}$ | $\begin{array}{r} 58 \\ \hline \\ \hline \end{array}$ |  | $8$ | $\begin{array}{r} 37 \\ 1 \end{array}$ | $\begin{array}{\|l\|} \hline \mathbf{3 4} \\ 55 \\ \hline \end{array}$ | $\begin{array}{\|r} \mathbf{1} \\ 33 \\ \hline \end{array}$ | 44 |
| 45 | 6 | $\begin{aligned} & \mathbf{0} \\ & \mathbf{1} \end{aligned}$ | $\begin{gathered} 40 \\ 20 \end{gathered}$ | $\begin{aligned} & 37 \\ & 30 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \mathbf{1 7} \\ 53 \\ \hline \end{array}$ |  | $\begin{aligned} & 3 \\ & 1 \end{aligned}$ | $\begin{aligned} & 8 \\ & 2 \end{aligned}$ | $\begin{array}{r} 4 \\ 23 \\ \hline \end{array}$ | $\begin{array}{\|l} 40 \\ 43 \end{array}$ |  | $5$ | $\begin{array}{r} 27 \\ 2 \end{array}$ | $\begin{aligned} & 48 \\ & 15 \\ & \hline \end{aligned}$ | $\begin{array}{r} 3 \\ 25 \\ \hline \end{array}$ |  | $7$ | $\begin{array}{r} 38 \\ 2 \end{array}$ | $\begin{array}{r} 39 \\ 5 \\ \hline \end{array}$ | $\begin{array}{r} 5 \\ 57 \\ \hline \end{array}$ |  | $9$ | $\left\|\begin{array}{r} 39 \\ 1 \end{array}\right\|$ | $\begin{array}{r} 29 \\ 55 \\ \hline \end{array}$ | $\begin{aligned} & 34 \\ & 22 \end{aligned}$ | 45 |
| 46 |  | $1$ | $\begin{array}{r} 43 \\ 2 \end{array}$ | $\begin{array}{r} 8 \\ 30 \\ \hline \end{array}$ | $\begin{aligned} & 10 \\ & 47 \\ & \hline \end{aligned}$ |  | $4$ | $\begin{array}{r} 10 \\ 2 \end{array}$ | $\begin{aligned} & 28 \\ & 23 \end{aligned}$ | $\begin{aligned} & 23 \\ & 35 \\ & \hline \end{aligned}$ |  | $6$ | $\underset{2}{30}$ | $\begin{array}{r} 3 \\ 15 \\ \hline \end{array}$ | $\begin{aligned} & 28 \\ & 15 \\ & \hline \end{aligned}$ |  | 8 | $\begin{array}{r} 40 \\ 2 \end{array}$ | $\begin{array}{r} 45 \\ \hline \end{array}$ | $\begin{array}{\|r} \hline 2 \\ 47 \\ \hline \end{array}$ |  | $\begin{array}{r} 10 \\ 1 \end{array}$ | $\begin{array}{r} 41 \\ 1 \end{array}$ | $\begin{aligned} & 24 \\ & 55 \\ & \hline \end{aligned}$ | $\begin{aligned} & 56 \\ & 11 \end{aligned}$ | 46 |
| 47 |  | $\begin{aligned} & 2 \\ & 1 \end{aligned}$ | $\begin{array}{r} 45 \\ \hline 2 \\ \hline \end{array}$ | $\begin{aligned} & 3^{8} \\ & 3^{0} \end{aligned}$ | $\begin{aligned} & 57 \\ & 40 \\ & \hline \end{aligned}$ |  | $\begin{aligned} & 5 \\ & 1 \end{aligned}$ | $\begin{array}{r} 12 \\ 2 \\ \hline \end{array}$ | $\begin{aligned} & 51 \\ & 23 \\ & \hline \end{aligned}$ | $\begin{aligned} & 58 \\ & 28 \\ & \hline \end{aligned}$ |  | $7$ | $\begin{array}{r} 32 \\ 2 \end{array}$ | $\begin{aligned} & 18 \\ & 15 \\ & \hline \end{aligned}$ | $\begin{array}{r} 43 \\ 6 \\ \hline \end{array}$ |  | $9$ | $\begin{array}{r} 42 \\ 2 \\ \hline \end{array}$ | $\begin{array}{r} 50 \\ 5 \\ \hline \end{array}$ | $\begin{aligned} & 49 \\ & 37 \\ & \hline \end{aligned}$ |  | $\begin{array}{r} 11 \\ 1 \end{array}$ | $\begin{array}{r} 43 \\ 1 \end{array}$ | $\begin{array}{\|l} \hline 20 \\ 55 \\ \hline \end{array}$ | $\begin{aligned} & 7 \\ & 0 \end{aligned}$ | 47 |
| 48 |  | $\begin{aligned} & 3 \\ & 1 \end{aligned}$ | $\begin{array}{r} 48 \\ 2 \end{array}$ | $\begin{array}{r} 9 \\ 30 \\ \hline \end{array}$ | $\begin{aligned} & 37 \\ & 33 \end{aligned}$ |  | $6$ | $\begin{array}{r} 15 \\ 2 \end{array}$ | $\begin{array}{\|l\|} \hline 15 \\ 23 \end{array}$ | $\begin{aligned} & 26 \\ & 19 \\ & \hline \end{aligned}$ |  | $8$ | $\begin{array}{r} 34 \\ 2 \end{array}$ | $\begin{array}{\|l} 33 \\ 14 \end{array}$ | $\begin{aligned} & 49 \\ & 58 \\ & \hline \end{aligned}$ |  | 10 | $\begin{gathered} 44 \\ 2 \end{gathered}$ | $\begin{array}{r} 56 \\ 5 \end{array}$ | $\begin{aligned} & 26 \\ & 27 \\ & \hline \end{aligned}$ |  | $\begin{array}{r} 12 \\ 1 \end{array}$ | $\begin{gathered} 45 \\ 1 \end{gathered}$ | $\begin{array}{\|l} 15 \\ 54 \\ \hline \end{array}$ | $\begin{array}{r} 7 \\ 48 \\ \hline \end{array}$ | 48 |
| 49 |  | $\begin{aligned} & 4 \\ & 1 \end{aligned}$ | $\begin{array}{r} 50 \\ 2 \end{array}$ | $\begin{aligned} & 40 \\ & 30 \\ & \hline \end{aligned}$ | $\begin{aligned} & \hline 10 \\ & 27 \\ & \hline \end{aligned}$ |  | $\begin{aligned} & 7 \\ & 1 \end{aligned}$ | $\begin{array}{r} 17 \\ 2 \end{array}$ | $\begin{aligned} & 38 \\ & 23 \\ & \hline \end{aligned}$ | $\begin{aligned} & 45 \\ & 12 \end{aligned}$ |  | $9$ | $\begin{array}{r} 36 \\ 2 \end{array}$ | $\begin{aligned} & \hline 48 \\ & 14 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 47 \\ 48 \\ \hline \end{array}$ |  | $11$ | $\begin{array}{r} 47 \\ 2 \end{array}$ | $\begin{aligned} & \mathbf{1} \\ & 5 \\ & \hline \end{aligned}$ | $\begin{aligned} & 53 \\ & 17 \\ & \hline \end{aligned}$ |  | $13$ | $\begin{array}{r} 47 \\ 1 \end{array}$ | $\begin{array}{\|r} \hline 9 \\ 54 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 55 \\ 37 \\ \hline \end{array}$ | 49 |
| 50 | 6 | $5$ | $\begin{array}{r} 53 \\ 2 \end{array}$ | $\begin{array}{\|l} 10 \\ 30 \end{array}$ | $\begin{aligned} & 37 \\ & 20 \end{aligned}$ | 7 | $8$ | $\begin{array}{r} 20 \\ 2 \end{array}$ | 1 23 | $\begin{array}{r} 57 \\ 4 \end{array}$ | 8 | $\begin{array}{r} 10 \\ 10 \end{array}$ | $\begin{array}{r} 39 \\ 2 \end{array}$ | $\begin{array}{r} 3 \\ 14 \end{array}$ | $\begin{array}{\|l\|} \hline 35 \\ 40 \end{array}$ | 9 | 12 | $\begin{array}{r} 49 \\ 2 \end{array}$ | $\begin{aligned} & 7 \\ & 5 \\ & \hline \end{aligned}$ | $\begin{array}{\|r} 10 \\ 7 \\ \hline \end{array}$ | 10 | 14 | $\begin{gathered} 49 \\ 1 \end{gathered}$ | $\begin{array}{r} 4 \\ 54 \\ \hline \end{array}$ | $\begin{aligned} & 32 \\ & 26 \end{aligned}$ | 50 |
| 51 |  | $\begin{aligned} & \hline 6 \\ & 1 \\ & \hline \end{aligned}$ | $\begin{array}{r} 55 \\ 2 \end{array}$ | $\begin{aligned} & 40 \\ & 30 \\ & \hline \end{aligned}$ | $\begin{aligned} & 57 \\ & 13 \\ & \hline \end{aligned}$ |  | $9$ | $\begin{array}{r} 22 \\ 2 \end{array}$ | $\begin{aligned} & 25 \\ & 22 \end{aligned}$ | $\begin{array}{\|r} \hline \mathbf{1} \\ 56 \\ \hline \end{array}$ |  | $11$ | $\begin{array}{r} 41 \\ 2 \end{array}$ | $\begin{array}{\|l\|} \hline 18 \\ 14 \\ \hline \end{array}$ | $\begin{aligned} & 15 \\ & 30 \\ & \hline \end{aligned}$ |  | $13$ | $\begin{array}{r} 51 \\ 2 \end{array}$ | $\begin{array}{r} 12 \\ 4 \\ \hline \end{array}$ | $\begin{array}{\|l} \mathbf{1 7} \\ 57 \\ \hline \end{array}$ |  | $15$ | $\begin{gathered} 50 \\ 1 \end{gathered}$ | $\begin{aligned} & 58 \\ & 54 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 58 \\ 15 \\ \hline \end{array}$ | 51 |
| 52 |  | $\begin{aligned} & \hline 7 \\ & 1 \end{aligned}$ | $\begin{array}{r} 58 \\ 2 \end{array}$ | $\begin{aligned} & 11 \\ & 30 \\ & \hline \end{aligned}$ | $\begin{array}{r} 10 \\ \hline 7 \\ \hline \end{array}$ |  | $10$ | $\begin{array}{r} 24 \\ 2 \\ \hline \end{array}$ | $\begin{aligned} & 47 \\ & 22 \end{aligned}$ | $\begin{array}{\|l} \hline 57 \\ 49 \\ \hline \end{array}$ |  | $12$ | $\begin{array}{r} 43 \\ 2 \end{array}$ | $\begin{aligned} & 3^{2} \\ & 14 \\ & \hline \end{aligned}$ | $\begin{aligned} & 45 \\ & 22 \\ & \hline \end{aligned}$ |  | $\begin{array}{\|r\|} \hline 14 \\ 1 \end{array}$ | $\begin{array}{r} 53 \\ 2 \end{array}$ | $\begin{array}{r} 17 \\ \hline 4 \\ \hline \end{array}$ | $\begin{aligned} & 14 \\ & 4^{6} \\ & \hline \end{aligned}$ |  | $\begin{array}{r} 16 \\ \hline \end{array}$ | $\begin{array}{r} 52 \\ 1 \end{array}$ | $\begin{array}{\|l\|} \hline 53 \\ 54 \\ \hline \end{array}$ | $\begin{array}{\|r} 13 \\ \hline 3 \\ \hline \end{array}$ | 52 |
| 53 |  | $\begin{aligned} & \hline 9 \\ & 1 \end{aligned}$ | $\begin{aligned} & \hline 0 \\ & 2 \end{aligned}$ | $\begin{aligned} & \hline \mathbf{4 1} \\ & 30 \\ & \hline \end{aligned}$ | $\begin{array}{r} 17 \\ \hline 0 \\ \hline \end{array}$ |  | $11$ | $\begin{array}{r} 27 \\ \hline 2 \\ \hline \end{array}$ | $\begin{aligned} & 10 \\ & 22 \\ & \hline \end{aligned}$ | $\begin{aligned} & 4^{6} \\ & 4^{0} \\ & \hline \end{aligned}$ |  | $13$ | $\begin{array}{r} 45 \\ 2 \end{array}$ | $\begin{aligned} & 47 \\ & 14 \end{aligned}$ | $\begin{array}{r} 7 \\ 12 \\ \hline \end{array}$ |  | $15$ | $\begin{array}{r} 55 \\ 2 \end{array}$ | $\begin{array}{r} 22 \\ \hline 4 \\ \hline \end{array}$ | $\begin{array}{r} \mathbf{o} \\ 36 \\ \hline \end{array}$ |  | $17$ | $\begin{array}{r} 54 \\ 1 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 47 \\ 53 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 16 \\ 52 \\ \hline \end{array}$ | 53 |
| 54 |  | $\begin{array}{r} 10 \\ 1 \end{array}$ | $\begin{aligned} & 3 \\ & 2 \end{aligned}$ | $\begin{array}{\|l} 11 \\ 29 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{1 7} \\ & 53 \\ & \hline \end{aligned}$ |  | $12$ | $\begin{array}{r} 29 \\ 2 \end{array}$ | $\begin{aligned} & 33 \\ & 23 \end{aligned}$ | $\begin{aligned} & 26 \\ & 32 \end{aligned}$ |  | $\begin{array}{r} 14 \\ 1 \end{array}$ | $\begin{array}{r} 48 \\ 2 \end{array}$ | $\begin{array}{\|r} \mathbf{1} \\ \mathbf{1 4} \\ \hline \end{array}$ | $\begin{array}{\|r\|} \hline 19 \\ 3 \end{array}$ |  | $\begin{array}{\|r} 16 \\ 1 \end{array}$ | $\begin{array}{r} 57 \\ 2 \end{array}$ | $\begin{array}{r} 26 \\ 4 \end{array}$ | $\begin{aligned} & 3^{6} \\ & 27 \\ & \hline \end{aligned}$ |  | $\begin{array}{r} 18 \\ 1 \end{array}$ | $\begin{gathered} 56 \\ 1 \end{gathered}$ | $\begin{array}{\|l} \mathbf{4 1} \\ 53 \\ \hline \end{array}$ | $\begin{array}{\|r} 8 \\ 41 \end{array}$ | 54 |
| 55 |  | $\begin{array}{r} 11 \\ 1 \end{array}$ | $\begin{aligned} & 5 \\ & 2 \end{aligned}$ | $\begin{aligned} & 41 \\ & 29 \end{aligned}$ | $\begin{array}{\|l} \hline 10 \\ 46 \\ \hline \end{array}$ |  | $13$ | $\begin{array}{r} 31 \\ 2 \end{array}$ | $\begin{aligned} & 55 \\ & 22 \\ & \hline \end{aligned}$ | $\begin{aligned} & 58 \\ & 25 \\ & \hline \end{aligned}$ |  | $15$ | $\begin{array}{r} 50 \\ 2 \end{array}$ | $\begin{aligned} & 15 \\ & 13 \end{aligned}$ | $\begin{array}{\|l} \hline 22 \\ 55 \\ \hline \end{array}$ |  | $\begin{array}{r} 17 \\ \hline 1 \end{array}$ | $\begin{array}{r} 59 \\ 2 \end{array}$ | $\begin{array}{r} \mathbf{3 1} \\ 4 \\ \hline \end{array}$ | $\begin{array}{r} 3 \\ 16 \\ \hline \end{array}$ |  | $19$ | $\begin{array}{r} 58 \\ 1 \end{array}$ | $\begin{array}{\|l\|} \hline \mathbf{3 4} \\ 53 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 49 \\ 30 \\ \hline \end{array}$ | 55 |
| 56 |  | $\begin{array}{r} 12 \\ 1 \end{array}$ | $\begin{aligned} & 8 \\ & 2 \end{aligned}$ | $\begin{aligned} & 10 \\ & 29 \\ & \hline \end{aligned}$ | $\begin{aligned} & 56 \\ & 40 \\ & \hline \end{aligned}$ |  | $\begin{array}{r} 14 \\ 1 \end{array}$ | $\begin{array}{r} 34 \\ 2 \end{array}$ | $\begin{array}{\|l\|} \hline 18 \\ 22 \end{array}$ | $\begin{aligned} & 23 \\ & 16 \end{aligned}$ |  | $\begin{array}{r} 16 \\ 1 \end{array}$ | $\begin{array}{r} 52 \\ 2 \end{array}$ | $\begin{aligned} & 29 \\ & 13 \end{aligned}$ | $\begin{array}{\|l} \hline \mathbf{1 7} \\ 45 \\ \hline \end{array}$ |  | $\begin{array}{r} 19 \\ 1 \end{array}$ | $\begin{aligned} & \mathbf{1} \\ & \mathbf{2} \end{aligned}$ | $\begin{array}{r} 35 \\ \hline \\ \hline \end{array}$ | $\begin{array}{r} 19 \\ 5 \\ \hline \end{array}$ |  | $21$ | $0$ | $\begin{aligned} & \hline 28 \\ & 53 \\ & \hline \end{aligned}$ | $\begin{aligned} & 19 \\ & 18 \\ & \hline \end{aligned}$ | 56 |
| 57 |  | $\begin{array}{r} 13 \\ 1 \end{array}$ | $\begin{array}{r} 10 \\ \hline 2 \\ \hline \end{array}$ | $\begin{aligned} & 40 \\ & 29 \end{aligned}$ | $\begin{aligned} & 36 \\ & 3^{2} \\ & \hline \end{aligned}$ |  | $15$ | $\begin{array}{r} 36 \\ 2 \end{array}$ | $\begin{aligned} & 40 \\ & 22 \end{aligned}$ | $\begin{array}{r} 39 \\ 9 \end{array}$ |  | $\begin{array}{r} 17 \\ 17 \end{array}$ | $\begin{array}{r} 54 \\ 2 \end{array}$ | $\begin{aligned} & 43 \\ & 13 \end{aligned}$ | $\begin{array}{\|r} \hline 2 \\ 3^{6} \\ \hline \end{array}$ |  | $20$ | $\begin{aligned} & 3 \\ & 2 \end{aligned}$ | $\begin{array}{\|c} 39 \\ 3 \end{array}$ | $\begin{array}{\|l} 24 \\ 56 \\ \hline \end{array}$ |  | 22 | 2 | $\begin{array}{\|} \mathbf{2 1} \\ 53 \\ \hline \end{array}$ | $\begin{array}{\|} 37 \\ 7 \\ \hline \end{array}$ | 57 |
| 58 |  | $\left.\begin{array}{r} 14 \\ 1 \end{array} \right\rvert\,$ | $\begin{array}{r} 13 \\ 2 \end{array}$ | $\begin{aligned} & 10 \\ & 29 \end{aligned}$ | $\begin{array}{r} 8 \\ 26 \end{array}$ |  | $\begin{array}{r} 16 \\ 1 \end{array}$ | $\begin{array}{r} 39 \\ 2 \end{array}$ | $\begin{array}{r} 2 \\ 22 \\ \hline \end{array}$ | $\begin{array}{r} 48 \\ 1 \end{array}$ |  | $\begin{array}{r} 18 \\ 1 \end{array}$ | $\begin{array}{r} 56 \\ 2 \end{array}$ | $\begin{aligned} & 56 \\ & 13 \end{aligned}$ | $\begin{aligned} & 38 \\ & 27 \\ & \hline \end{aligned}$ |  | $21$ | $5$ | $\begin{array}{\|r} 43 \\ 3 \end{array}$ | $\begin{aligned} & 20 \\ & 45 \\ & \hline \end{aligned}$ |  | $\begin{array}{\|c} 23 \\ 1 \end{array}$ | $\begin{aligned} & 4 \\ & 1 \\ & \hline \end{aligned}$ | $\begin{aligned} & 14 \\ & 52 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 44 \\ 55 \\ \hline \end{array}$ | 58 |
| 59 |  | $\left\|\begin{array}{r} 15 \\ 1 \end{array}\right\|$ | $\begin{array}{r} 15 \\ 2 \end{array}$ | $\begin{array}{\|l} 39 \\ 29 \\ \hline \end{array}$ | $\begin{array}{\|l} 34 \\ 19 \\ \hline \end{array}$ |  | $\begin{array}{r} 17 \\ 1 \end{array}$ | $\begin{array}{r} 41 \\ 2 \end{array}$ | $\left\lvert\, \begin{aligned} & 24 \\ & 21 \end{aligned}\right.$ | $\begin{aligned} & 49 \\ & 52 \end{aligned}$ |  | $\begin{array}{r} 19 \\ 1 \end{array}$ | $\begin{array}{\|r} 59 \\ 2 \end{array}$ | $\begin{array}{\|l} 10 \\ 13 \\ \hline \end{array}$ | $\begin{array}{r} 5 \\ 18 \end{array}$ |  | 22 1 | $\begin{aligned} & 7 \\ & 2 \end{aligned}$ | $\begin{array}{\|r} 47 \\ 3 \end{array}$ | $\begin{array}{r} 5 \\ 35 \\ \hline \end{array}$ |  | 24 | 6 | $\begin{array}{r} 7 \\ 52 \\ \hline \end{array}$ | $\begin{array}{\|} 39 \\ 44 \\ \hline \end{array}$ | 59 |
| 60 | 6 | $\begin{array}{r} 16 \\ \hline 1 \\ \hline \end{array}$ | $\begin{array}{r} 18 \\ \hline 2 \\ \hline \end{array}$ | $\begin{array}{\|r\|} \hline 8 \\ 29 \\ \hline \end{array}$ | $\begin{aligned} & 53 \\ & 12 \end{aligned}$ | 7 | $\begin{array}{r} 18 \\ 1 \end{array}$ | $\begin{array}{r} 43 \\ 2 \end{array}$ | $\begin{aligned} & 46 \\ & 21 \end{aligned}$ | $\begin{aligned} & \mathbf{4 1} \\ & \mathbf{4 5} \end{aligned}$ | 8 | $\begin{array}{r} 21 \\ 1 \end{array}$ | $\begin{aligned} & 1 \\ & 2 \end{aligned}$ | $\begin{aligned} & 23 \\ & 13 \\ & \hline \end{aligned}$ | $\begin{array}{\|c} 23 \\ 9 \\ \hline \end{array}$ | 9 | $\begin{array}{r} 23 \\ 1 \end{array}$ | $\begin{aligned} & 9 \\ & 2 \end{aligned}$ | $\begin{gathered} \mathbf{5 0} \\ 3 \end{gathered}$ | $\begin{aligned} & 40 \\ & 25 \\ & \hline \end{aligned}$ | 10 | $\begin{array}{r} 25 \\ 1 \end{array}$ | 8 1 | $\begin{array}{r} 0 \\ 52 \\ \hline \end{array}$ | $\begin{aligned} & 23 \\ & 33 \end{aligned}$ | 60 |

Bürgi's 1' sine table (reconstruction, D. Roegel, 2016)

| 1 | $10^{\circ}$ |  |  |  |  | $11^{\circ}$ |  |  |  |  | $12^{\circ}$ |  |  |  |  | $13^{\circ}$ |  |  |  |  | $14^{\circ}$ |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 0 | 10 | $\begin{array}{r} 25 \\ 1 \end{array}$ | $\begin{array}{l\|} \hline 8 \\ 1 \\ \hline \end{array}$ | $\begin{array}{r} 0 \\ 5^{2} \end{array}$ | $\begin{aligned} & 23 \\ & 33 \\ & \hline \end{aligned}$ | 11 | $\begin{array}{r} 26 \\ 1 \end{array}$ | $\begin{array}{r} 54 \\ 1 \end{array}$ | $\begin{aligned} & 44 \\ & 40 \\ & \hline \end{aligned}$ | $\begin{aligned} & 35 \\ & 32 \end{aligned}$ | 12 | $\begin{array}{r} 28 \\ 1 \end{array}$ | $\begin{array}{r} 28 \\ 1 \end{array}$ | $\begin{aligned} & 55 \\ & 27 \end{aligned}$ | $\begin{aligned} & \hline \mathbf{3 1} \\ & \mathbf{2 5} \end{aligned}$ | 13 | $\begin{array}{r} 29 \\ 1 \end{array}$ | $\begin{array}{\|c\|} \hline 49 \\ 1 \end{array}$ | $\begin{aligned} & 25 \\ & 13 \end{aligned}$ | $\begin{aligned} & 40 \\ & 10 \end{aligned}$ | 14 | $\begin{array}{r} 30 \\ 1 \end{array}$ | $\begin{array}{r} 55 \\ 0 \end{array}$ | $\begin{array}{\|r} 7 \\ 57 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 46 \\ 48 \end{array}$ | 0 |
| 1 |  | $\begin{array}{r} 26 \\ 1 \\ \hline \end{array}$ | $\begin{aligned} & 9 \\ & 1 \end{aligned}$ | $\begin{aligned} & 52 \\ & 52 \\ & \hline \end{aligned}$ | $\begin{aligned} & 56 \\ & 21 \end{aligned}$ |  | $27$ | $\begin{array}{r} 56 \\ 1 \end{array}$ | $\begin{aligned} & 25 \\ & 40 \\ & \hline \end{aligned}$ | $\begin{array}{r} 7 \\ 20 \\ \hline \end{array}$ |  | $29$ | $\begin{gathered} 30 \\ 1 \end{gathered}$ | $\begin{array}{\|l} \hline 22 \\ 27 \\ \hline \end{array}$ | $\begin{aligned} & 56 \\ & 11 \end{aligned}$ |  | $\underset{1}{30}$ | $\begin{gathered} 50 \\ 1 \end{gathered}$ | $\begin{aligned} & 38 \\ & 12 \end{aligned}$ | $\begin{aligned} & 50 \\ & 55 \\ & \hline \end{aligned}$ |  | $\begin{array}{r} 31 \\ 1 \end{array}$ | $\begin{gathered} 56 \\ 0 \end{gathered}$ | $\begin{array}{\|r} \hline \mathbf{5} \\ 57 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline \mathbf{3 4} \\ 32 \\ \hline \end{array}$ | 1 |
| 2 |  | $\begin{array}{r} 27 \\ \hline 1 \end{array}$ | $\begin{array}{\|r\|} \hline 11 \\ 1 \end{array}$ | $\begin{aligned} & 45 \\ & 52 \end{aligned}$ | $\begin{array}{r} 17 \\ \hline 9 \\ \hline \end{array}$ |  | $\begin{array}{r} 28 \\ 1 \end{array}$ | $\begin{array}{r} 58 \\ 1 \end{array}$ | $\begin{array}{r} 5 \\ 40 \end{array}$ | $\begin{array}{r} 27 \\ 8 \\ \hline \end{array}$ |  | $\begin{gathered} 30 \\ 1 \end{gathered}$ | $\begin{array}{r} 31 \\ 1 \end{array}$ | $\begin{aligned} & 50 \\ & 26 \end{aligned}$ | $\begin{array}{r} 7 \\ 57 \end{array}$ |  | $\begin{array}{r} 31 \\ 1 \end{array}$ | $\begin{array}{\|c\|} \hline 51 \\ 1 \end{array}$ | $\begin{array}{\|l\|} \hline 51 \\ 12 \end{array}$ | $\begin{array}{\|l} \hline 45 \\ 40 \\ \hline \end{array}$ |  | $\begin{array}{r} 32 \\ 1 \end{array}$ | $\begin{array}{r} 57 \\ 0 \end{array}$ | $\begin{array}{\|r} 3 \\ 57 \\ \hline \end{array}$ | $\begin{array}{r} 6 \\ 15 \\ \hline \end{array}$ |  |
| 3 |  | $\begin{array}{r} 28 \\ 1 \end{array}$ | $\begin{array}{\|c} 13 \\ 1 \end{array}$ | $\begin{array}{\|l} 37 \\ 51 \\ \hline \end{array}$ | $\begin{aligned} & 26 \\ & 58 \\ & \hline \end{aligned}$ |  | $\begin{array}{\|c} 29 \\ 1 \\ \hline \end{array}$ | $\begin{array}{\|c} 59 \\ 1 \end{array}$ | $\begin{aligned} & 45 \\ & 39 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 35 \\ 55 \\ \hline \end{array}$ |  | $\begin{array}{r} 31 \\ 1 \end{array}$ | $\begin{array}{r} 33 \\ 1 \end{array}$ | $\begin{aligned} & 17 \\ & 26 \end{aligned}$ | $\begin{array}{r} 4 \\ 44 \\ \hline \end{array}$ |  | $32$ | $53$ | $\begin{array}{r} 4 \\ 12 \end{array}$ | $\begin{array}{\|l\|} \hline 25 \\ 26 \\ \hline \end{array}$ |  | $33$ | $\begin{gathered} 58 \\ 0 \end{gathered}$ | $\begin{array}{\|r} \hline \mathbf{0} \\ 57 \\ \hline \end{array}$ | $\begin{array}{r} 21 \\ 0 \end{array}$ | 3 |
| 4 |  | $\begin{array}{\|r\|} \hline 29 \\ 1 \\ \hline \end{array}$ | $\begin{array}{r} 15 \\ 1 \end{array}$ | $\begin{aligned} & 29 \\ & 51 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 24 \\ 47 \\ \hline \end{array}$ |  | $\begin{array}{r} 31 \\ 1 \end{array}$ | $\begin{aligned} & 1 \\ & 1 \end{aligned}$ | $\begin{aligned} & 25 \\ & 39 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 30 \\ 42 \\ \hline \end{array}$ |  | $\begin{gathered} 32 \\ 1 \end{gathered}$ | $\begin{array}{\|c\|} \hline 34 \\ 1 \end{array}$ | $\begin{aligned} & 43 \\ & 26 \end{aligned}$ | $\begin{aligned} & 48 \\ & 30 \end{aligned}$ |  | $\begin{array}{r} 33 \\ 1 \end{array}$ | $54$ | $\begin{array}{\|l\|} \hline 16 \\ 12 \end{array}$ | $\begin{aligned} & \hline \mathbf{5 1} \\ & 10 \end{aligned}$ |  | $\begin{array}{r} 34 \\ 1 \end{array}$ | $\begin{gathered} 58 \\ 0 \\ \hline \end{gathered}$ | $\begin{aligned} & 57 \\ & \hline 56 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline \mathbf{2 1} \\ 44 \\ \hline \end{array}$ | 4 |
| 5 |  | $\begin{gathered} 30 \\ 1 \end{gathered}$ | $\begin{array}{r} 17 \\ 1 \end{array}$ | $\begin{aligned} & 21 \\ & 51 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline \mathbf{1 1} \\ 35 \\ \hline \end{array}$ |  | $\begin{gathered} 32 \\ 1 \end{gathered}$ | $\begin{aligned} & \hline 3 \\ & 1 \end{aligned}$ | $\begin{array}{r} \mathbf{5} \\ 39 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 12 \\ 29 \\ \hline \end{array}$ |  | $\begin{array}{\|c} 33 \\ 1 \end{array}$ | $\begin{array}{r} 36 \\ 1 \end{array}$ | $\begin{aligned} & 10 \\ & 26 \end{aligned}$ | $\begin{aligned} & 18 \\ & 17 \end{aligned}$ |  | $\begin{array}{\|r\|} \hline 34 \\ 1 \end{array}$ | $55$ | $\begin{array}{l\|} \hline 29 \\ 11 \end{array}$ | $\begin{array}{\|r} \hline \mathbf{1} \\ 5^{6} \\ \hline \end{array}$ |  | $\begin{array}{r} 35 \\ 1 \end{array}$ | $\begin{gathered} 59 \\ 0 \end{gathered}$ | $\begin{array}{\|l\|} \hline 54 \\ 56 \\ \hline \end{array}$ | $\begin{array}{r} 5 \\ 28 \end{array}$ | 5 |
| 6 |  | $\begin{array}{r} 31 \\ 1 \end{array}$ | $\begin{array}{r} 19 \\ 1 \end{array}$ | $\begin{aligned} & 12 \\ & 51 \\ & \hline \end{aligned}$ | $\begin{aligned} & 46 \\ & 24 \\ & \hline \end{aligned}$ |  | $\begin{array}{r} 33 \\ 1 \end{array}$ | $\begin{aligned} & 4 \\ & 1 \end{aligned}$ | $\begin{aligned} & 44 \\ & 39 \end{aligned}$ | $\begin{array}{\|l\|} \hline \mathbf{4 1} \\ \mathbf{1 7} \\ \hline \end{array}$ |  | $\begin{array}{r} 34 \\ 1 \end{array}$ | $\begin{array}{r} 37 \\ 1 \end{array}$ | $\begin{aligned} & 36 \\ & 26 \end{aligned}$ | $\begin{array}{r} 35 \\ 2 \end{array}$ |  | $\begin{array}{r} 35 \\ 1 \end{array}$ | $\begin{gathered} 56 \\ 1 \end{gathered}$ | $\begin{aligned} & 40 \\ & 11 \end{aligned}$ | $\begin{array}{\|l} \hline 57 \\ 40 \\ \hline \end{array}$ |  | $\begin{array}{r} 37 \\ 1 \end{array}$ | $0$ | $\begin{aligned} & 50 \\ & 56 \end{aligned}$ | $\begin{array}{\|l\|} \hline 33 \\ 12 \end{array}$ | 6 |
| 7 |  | $\begin{array}{r} 32 \\ 1 \end{array}$ | $\begin{array}{r} 21 \\ 1 \end{array}$ | $\begin{array}{r} 4 \\ 51 \\ \hline \end{array}$ | $\begin{aligned} & 10 \\ & 12 \end{aligned}$ |  | $\begin{array}{\|c} 34 \\ 1 \end{array}$ | $6$ | $\begin{aligned} & 23 \\ & 39 \end{aligned}$ | $\begin{array}{r} 58 \\ \hline 4 \\ \hline \end{array}$ |  | $\begin{gathered} 35 \\ 1 \end{gathered}$ | $\begin{gathered} 39 \\ 1 \end{gathered}$ | $\begin{array}{r} 2 \\ 25 \\ \hline \end{array}$ | $\begin{array}{\|l} 37 \\ 49 \\ \hline \end{array}$ |  | $\begin{array}{r} 36 \\ 1 \end{array}$ | $\begin{array}{r} 57 \\ 1 \end{array}$ | $\begin{aligned} & 52 \\ & 11 \end{aligned}$ | $\begin{aligned} & 37 \\ & 26 \end{aligned}$ |  | $\begin{array}{r} 38 \\ 1 \end{array}$ | $\begin{aligned} & \mathbf{1} \\ & \mathbf{0} \end{aligned}$ | $\begin{aligned} & 46 \\ & 55 \end{aligned}$ | $\begin{aligned} & 45 \\ & 56 \end{aligned}$ | 7 |
| 8 |  | $\begin{array}{r} 33 \\ 1 \end{array}$ | $\begin{array}{\|r} 22 \\ 1 \end{array}$ | $\begin{aligned} & 55 \\ & 51 \\ & \hline \end{aligned}$ | $\begin{array}{r} 22 \\ 0 \end{array}$ |  | $\begin{array}{r} 35 \\ 1 \end{array}$ | $8$ | $\begin{array}{r} 3 \\ 38 \\ \hline \end{array}$ | $\begin{array}{r} 2 \\ 52 \\ \hline \end{array}$ |  | $\begin{gathered} 36 \\ 1 \end{gathered}$ | $\begin{gathered} 40 \\ 1 \end{gathered}$ | $\begin{array}{\|l} \hline 28 \\ 25 \\ \hline \end{array}$ | $\begin{aligned} & 26 \\ & 34 \end{aligned}$ |  | $\begin{array}{r} 37 \\ 1 \end{array}$ | $\begin{array}{r} 59 \\ 1 \end{array}$ | $\begin{array}{r} 4 \\ 11 \end{array}$ | $\begin{array}{\|r} 3 \\ 11 \end{array}$ |  | $\begin{array}{r} 39 \\ 1 \end{array}$ | $\begin{aligned} & 2 \\ & 0 \end{aligned}$ | $\begin{aligned} & \mathbf{4 2} \\ & 55 \\ & \hline \end{aligned}$ | $\begin{aligned} & 41 \\ & 40 \end{aligned}$ | 8 |
| 9 |  | $\left[\begin{array}{c} 34 \\ 1 \end{array}\right.$ | $\begin{gathered} 24 \\ 1 \end{gathered}$ | $\begin{aligned} & 46 \\ & 50 \end{aligned}$ | $\begin{aligned} & 22 \\ & 49 \\ & \hline \end{aligned}$ |  | $\begin{array}{r} 36 \\ 1 \end{array}$ | $9$ | $\begin{aligned} & \mathbf{4 1} \\ & 38 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 54 \\ 38 \\ \hline \end{array}$ |  | $\begin{array}{r} 37 \\ 1 \end{array}$ | $\begin{array}{r} 41 \\ 1 \end{array}$ | $\begin{array}{\|l} \mathbf{5 4} \\ \mathbf{2 5} \\ \hline \end{array}$ | $\begin{array}{\|r} 0 \\ 21 \end{array}$ |  | $\begin{array}{\|r} 39 \\ 1 \end{array}$ | $\begin{aligned} & 0 \\ & 1 \end{aligned}$ | $\begin{aligned} & 15 \\ & 10 \end{aligned}$ | $\begin{array}{\|l} 14 \\ 56 \\ \hline \end{array}$ |  | $\begin{gathered} 40 \\ 1 \end{gathered}$ | $\begin{aligned} & \mathbf{3} \\ & \mathbf{0} \end{aligned}$ | $\begin{aligned} & 38 \\ & 55 \end{aligned}$ | $\begin{array}{\|l} 21 \\ 23 \\ \hline \end{array}$ |  |
| 10 | 10 | $\begin{array}{r} 35 \\ 1 \\ \hline \end{array}$ | $\begin{array}{r} 26 \\ 1 \\ \hline \end{array}$ | $\begin{aligned} & 37 \\ & 50 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline \mathbf{1 1} \\ 37 \\ \hline \end{array}$ | 11 | $\begin{array}{r} 37 \\ 1 \end{array}$ | $\begin{array}{r} 11 \\ 1 \end{array}$ | $\begin{array}{\|l} \hline 20 \\ 3^{8} \\ \hline \end{array}$ | $\begin{aligned} & 32 \\ & 26 \\ & \hline \end{aligned}$ | 12 | $\begin{array}{r} 38 \\ 1 \end{array}$ | $\begin{array}{r} 43 \\ 1 \end{array}$ | $\begin{array}{\|l} \hline 19 \\ 25 \\ \hline \end{array}$ | $\begin{array}{r} 21 \\ \hline 8 \\ \hline \end{array}$ | 13 | $\begin{array}{r} 40 \\ 1 \end{array}$ | $\begin{aligned} & 1 \\ & 1 \end{aligned}$ | $\begin{aligned} & 26 \\ & 10 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 10 \\ 41 \\ \hline \end{array}$ | 14 | $\begin{array}{r} 41 \\ 1 \end{array}$ | $\begin{aligned} & 4 \\ & 0 \end{aligned}$ | $\begin{array}{\|l} \hline 33 \\ 55 \\ \hline \end{array}$ | $\begin{array}{r} 44 \\ \hline 8 \end{array}$ |  |
| 11 |  | $\begin{array}{r} 36 \\ 1 \end{array}$ | $\begin{array}{r} 28 \\ 1 \\ \hline \end{array}$ | $\begin{aligned} & 27 \\ & 50 \\ & \hline \end{aligned}$ | $\begin{aligned} & 48 \\ & 26 \\ & \hline \end{aligned}$ |  | $\begin{array}{r} 38 \\ 1 \end{array}$ | $\begin{array}{r} 12 \\ 1 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 58 \\ 38 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 58 \\ 14 \\ \hline \end{array}$ |  | $\begin{gathered} 39 \\ 1 \\ \hline \end{gathered}$ | $\begin{gathered} 44 \\ 1 \end{gathered}$ | $\begin{array}{\|l\|} \hline 44 \\ 24 \\ \hline \end{array}$ | $\begin{aligned} & 29 \\ & 53 \end{aligned}$ |  | $\begin{array}{r} 41 \\ 1 \end{array}$ | $\begin{aligned} & 2 \\ & 1 \\ & \hline \end{aligned}$ | $\begin{array}{l\|} \hline 36 \\ 10 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{5 1} \\ & 26 \end{aligned}$ |  | $\begin{array}{r} 42 \\ 1 \end{array}$ | $\begin{aligned} & 5 \\ & 0 \end{aligned}$ | $\begin{array}{\|l} \hline 28 \\ 54 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 5^{2} \\ 51 \\ \hline \end{array}$ |  |
| 12 |  | $\begin{array}{r} 37 \\ 1 \end{array}$ | $\begin{gathered} 30 \\ 1 \end{gathered}$ | $\begin{aligned} & 18 \\ & 50 \end{aligned}$ | $\begin{aligned} & \hline 14 \\ & 14 \\ & \hline \end{aligned}$ |  | $\begin{array}{r} 39 \\ 1 \end{array}$ | $\begin{array}{r} 14 \\ 1 \end{array}$ | $\begin{array}{\|l\|} \hline 37 \\ 38 \\ \hline \end{array}$ | $\begin{array}{r} 12 \\ \hline 0 \end{array}$ |  | $40$ | $\begin{array}{r} 46 \\ 1 \end{array}$ | $\begin{array}{r} 9 \\ 24 \\ \hline \end{array}$ | $\begin{aligned} & 22 \\ & 39 \end{aligned}$ |  | $\mathbf{4 2}^{2}$ | $3$ | $\begin{aligned} & 47 \\ & 10 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 17 \\ 10 \\ \hline \end{array}$ |  | $43$ | $6$ | $\begin{array}{\|l\|} \hline 23 \\ 54 \\ \hline \end{array}$ | $\begin{aligned} & 43 \\ & 36 \end{aligned}$ |  |
| 13 |  | $\begin{array}{r} 38 \\ 1 \\ \hline \end{array}$ | $\begin{array}{r} 32 \\ 1 \end{array}$ | $\begin{array}{r} 8 \\ 50 \\ \hline \end{array}$ | $\begin{array}{r} 28 \\ \hline 2 \\ \hline \end{array}$ |  | $\begin{gathered} 40 \\ 1 \end{gathered}$ | $\begin{array}{r} 16 \\ 1 \end{array}$ | $\begin{array}{\|l\|} \hline 15 \\ 37 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 12 \\ 48 \\ \hline \end{array}$ |  | $\begin{array}{r} 41 \\ 1 \end{array}$ | $\begin{array}{r} 47 \\ 1 \end{array}$ | $\begin{aligned} & 34 \\ & 24 \\ & \hline \end{aligned}$ | $\begin{array}{r} 1 \\ 25 \\ \hline \end{array}$ |  | $\begin{array}{r} 43 \\ 1 \end{array}$ | $\begin{aligned} & 4 \\ & 1 \end{aligned}$ | $\begin{array}{\|r} 57 \\ \hline 9 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 27 \\ 56 \\ \hline \end{array}$ |  | $44$ | $\begin{aligned} & 7 \\ & \mathrm{o} \end{aligned}$ | $\begin{array}{\|l\|} \hline \mathbf{1 8} \\ 54 \\ \hline \end{array}$ | $\begin{array}{\|l} 19 \\ 19 \\ \hline \end{array}$ |  |
| 14 |  | $\begin{array}{r} 39 \\ 1 \\ \hline \end{array}$ | $33$ | $\begin{aligned} & \hline 58 \\ & 49 \\ & \hline \end{aligned}$ | $\begin{aligned} & 30 \\ & 51 \\ & \hline \end{aligned}$ |  | $\begin{array}{r} 41 \\ 1 \end{array}$ | $\begin{array}{\|r} 17 \\ 1 \end{array}$ | $\begin{array}{\|l} 53 \\ 37 \\ \hline \end{array}$ | $\begin{array}{\|r} \hline \mathbf{o} \\ 34 \\ \hline \end{array}$ |  | $\begin{array}{r} 42 \\ 1 \end{array}$ | $\begin{array}{r} 48 \\ 1 \end{array}$ | $\begin{aligned} & 58 \\ & 24 \\ & \hline \end{aligned}$ | $\begin{aligned} & 26 \\ & 12 \end{aligned}$ |  | $\begin{array}{r} 44 \\ 1 \end{array}$ | $6$ | $\begin{aligned} & 7 \\ & 9 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 23 \\ 41 \\ \hline \end{array}$ |  | $\begin{gathered} 45 \\ 1 \end{gathered}$ | $8$ | $\begin{array}{\|l\|} \hline 12 \\ 54 \\ \hline \end{array}$ | $\begin{array}{r} 38 \\ \hline \end{array}$ |  |
| 15 |  | $\begin{gathered} 40 \\ 1 \end{gathered}$ | $\begin{gathered} 35 \\ 1 \end{gathered}$ | $\begin{aligned} & 48 \\ & 49 \\ & \hline \end{aligned}$ | $\begin{aligned} & \mathbf{2 1} \\ & 39 \\ & \hline \end{aligned}$ |  | $\begin{array}{r} 42 \\ 1 \end{array}$ | $\begin{array}{\|c} 19 \\ 1 \end{array}$ | $\begin{aligned} & \mathbf{3 0} \\ & 37 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 34 \\ 22 \end{array}$ |  | $\begin{array}{\|c} 43 \\ 1 \end{array}$ | $\left[\begin{array}{c} 50 \\ 1 \end{array}\right.$ | $\begin{array}{\|l} 22 \\ 23 \\ \hline \end{array}$ | $\begin{aligned} & 38 \\ & 57 \\ & \hline \end{aligned}$ |  | $\begin{array}{r} 45 \\ 1 \end{array}$ | $7$ | $\begin{array}{r} 17 \\ 9 \\ \hline \end{array}$ | $\begin{array}{r} 4 \\ 26 \end{array}$ |  | $\begin{array}{r} 46 \\ 1 \end{array}$ | $\begin{aligned} & \mathbf{9} \\ & \mathrm{o} \end{aligned}$ | $\begin{array}{r} 6 \\ 53 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 41 \\ 46 \\ \hline \end{array}$ |  |
| 16 |  | $\begin{array}{r} 41 \\ 1 \end{array}$ | $\begin{array}{r} 37 \\ 1 \end{array}$ | $\begin{aligned} & 3^{8} \\ & 49 \\ & \hline \end{aligned}$ | $\begin{array}{r} \mathbf{o} \\ \mathbf{2 7} \\ \hline \end{array}$ |  | $\begin{array}{r} 43 \\ 1 \end{array}$ | $\begin{array}{r} 21 \\ 1 \end{array}$ | $\begin{array}{r} 7 \\ 37 \\ \hline \end{array}$ | $\begin{aligned} & 56 \\ & 10 \end{aligned}$ |  | $\begin{array}{r} 44 \\ 1 \end{array}$ | $\begin{array}{r} 51 \\ 1 \end{array}$ | $\begin{aligned} & 46 \\ & 23 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 35 \\ 44 \end{array}$ |  | $\begin{array}{r} 46 \\ 1 \end{array}$ | 8 <br> 1 | $\begin{array}{r} 26 \\ 9 \end{array}$ | $\begin{aligned} & 30 \\ & 10 \end{aligned}$ |  | $\begin{array}{r} 47 \\ 1 \end{array}$ | $\begin{gathered} 10 \\ \hline 0 \end{gathered}$ | $\begin{array}{r} \mathbf{0} \\ 53 \end{array}$ | $\begin{array}{\|l} \hline 27 \\ 31 \\ \hline \end{array}$ |  |
| 17 |  | $\begin{array}{r} 42 \\ 1 \end{array}$ | $\begin{gathered} 39 \\ 1 \end{gathered}$ | $\begin{array}{r} 27 \\ 49 \\ \hline \end{array}$ | $\begin{aligned} & 27 \\ & 15 \\ & \hline \end{aligned}$ |  | $\begin{gathered} 44 \\ 1 \end{gathered}$ | $\begin{array}{\|r} 22 \\ 1 \end{array}$ | $\begin{aligned} & 45 \\ & 36 \end{aligned}$ | $\begin{array}{\|r} \hline 6 \\ 56 \\ \hline \end{array}$ |  | $\begin{array}{r} 45 \\ 1 \end{array}$ | $\begin{array}{r} 53 \\ 1 \end{array}$ | $\begin{array}{\|l} 10 \\ 23 \\ \hline \end{array}$ | $\begin{array}{\|l} 19 \\ 29 \\ \hline \end{array}$ |  | $\begin{array}{r} 47 \\ 1 \end{array}$ | $9$ | $\begin{array}{r} 35 \\ 8 \end{array}$ | $\begin{array}{\|l} \hline 40 \\ 56 \\ \hline \end{array}$ |  | $\begin{array}{r} 48 \\ 1 \end{array}$ | $\begin{array}{r} 10 \\ 0 \end{array}$ | $\begin{array}{\|l} 53 \\ 53 \\ \hline \end{array}$ | $\begin{aligned} & 58 \\ & 14 \end{aligned}$ |  |
| 18 |  | $\begin{gathered} 43 \\ 1 \end{gathered}$ | $\begin{array}{\|r} 41 \\ 1 \end{array}$ | $\begin{aligned} & \mathbf{1 6} \\ & 49 \end{aligned}$ | $\begin{array}{r} 42 \\ 4 \\ \hline \end{array}$ |  | $\begin{gathered} 45 \\ 1 \end{gathered}$ | $\begin{array}{\|c} 24 \\ 1 \end{array}$ | $\begin{aligned} & 22 \\ & 36 \\ & \hline \end{aligned}$ | $\begin{array}{r} 2 \\ 43 \\ \hline \end{array}$ |  | $\begin{array}{r} 46 \\ 1 \end{array}$ | $\begin{gathered} 54 \\ 1 \end{gathered}$ | $\left\lvert\, \begin{aligned} & 33 \\ & 23 \end{aligned}\right.$ | $\begin{aligned} & 48 \\ & 16 \end{aligned}$ |  | $\begin{array}{r} 48 \\ 1 \end{array}$ | $\begin{array}{\|r} 10 \\ 1 \end{array}$ | $\begin{array}{r} 44 \\ 8 \end{array}$ | $\begin{aligned} & 36 \\ & 40 \\ & \hline \end{aligned}$ |  | $\begin{gathered} 49 \\ 1 \end{gathered}$ | $\begin{array}{r} 11 \\ 0 \end{array}$ | $\begin{aligned} & 47 \\ & 52 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 12 \\ 58 \end{array}$ |  |
| 19 |  | $\begin{array}{r} 44 \\ 1 \end{array}$ | $\begin{array}{r} 43 \\ 1 \end{array}$ | $\begin{array}{r} 5 \\ 48 \\ \hline \end{array}$ | $\begin{aligned} & 4^{6} \\ & 52 \\ & \hline \end{aligned}$ |  | $\begin{array}{r} 46 \\ 1 \end{array}$ | $\begin{array}{r} 25 \\ 1 \end{array}$ | $\begin{aligned} & 58 \\ & 36 \\ & \hline \end{aligned}$ | $\begin{aligned} & 45 \\ & 21 \end{aligned}$ |  | $\begin{array}{r} 47 \\ 1 \end{array}$ | $\begin{array}{r} 55 \\ 1 \end{array}$ | $\begin{array}{\|l} \hline 57 \\ 23 \\ \hline \end{array}$ | $\begin{aligned} & 4 \\ & 1 \end{aligned}$ |  | $\begin{array}{r} 49 \\ 1 \end{array}$ | $\begin{array}{\|r\|} \hline 11 \\ 1 \end{array}$ | $\begin{array}{r} 53 \\ 8 \end{array}$ | $\begin{array}{\|l\|} \hline 16 \\ 25 \\ \hline \end{array}$ |  | $\begin{gathered} 50 \\ 1 \end{gathered}$ | $\begin{array}{r} 12 \\ 0 \end{array}$ | $\begin{aligned} & 40 \\ & 52 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 10 \\ 42 \\ \hline \end{array}$ |  |
| 20 | 10 | $\begin{gathered} 45 \\ 1 \end{gathered}$ | $\begin{gathered} 44 \\ 1 \end{gathered}$ | $\begin{array}{\|l} 54 \\ 48 \\ \hline \end{array}$ | $\begin{aligned} & 38 \\ & 40 \end{aligned}$ | 11 | $\begin{array}{r} 47 \\ 1 \end{array}$ | $\begin{array}{r} 27 \\ 1 \end{array}$ | $\begin{aligned} & 35 \\ & 36 \end{aligned}$ | $\begin{aligned} & 16 \\ & 17 \end{aligned}$ | 12 | $\begin{array}{r} 48 \\ 1 \end{array}$ | $\begin{array}{r} 57 \\ 1 \end{array}$ | $\begin{aligned} & 20 \\ & 22 \end{aligned}$ | $\begin{array}{r} 5 \\ 48 \\ \hline \end{array}$ | 13 | $\left\lvert\, \begin{array}{r} 50 \\ 1 \end{array}\right.$ | $\begin{array}{\|r} 13 \\ 1 \end{array}$ | $8$ | $\begin{aligned} & 41 \\ & 10 \end{aligned}$ | 14 | $\begin{array}{r} 51 \\ 1 \end{array}$ | $\begin{array}{r} 13 \\ 0 \end{array}$ | $\begin{aligned} & 32 \\ & 52 \\ & \hline \end{aligned}$ | $\begin{aligned} & 52 \\ & 26 \end{aligned}$ |  |
| 21 |  | $\begin{gathered} 46 \\ 1 \end{gathered}$ | $\begin{array}{r} 46 \\ 1 \end{array}$ | $\begin{aligned} & 43 \\ & 48 \end{aligned}$ | $\begin{aligned} & 18 \\ & 28 \end{aligned}$ |  | $\begin{array}{r} 48 \\ 1 \end{array}$ | $\begin{array}{r} 29 \\ 1 \end{array}$ | $\begin{aligned} & \mathbf{1 1} \\ & 36 \\ & \hline \end{aligned}$ | $\begin{array}{r} 33 \\ \hline \\ \hline \end{array}$ |  | $\begin{array}{r} 49 \\ 1 \end{array}$ | $\begin{gathered} 58 \\ 1 \end{gathered}$ | $\begin{array}{\|l} \hline 42 \\ 22 \\ \hline \end{array}$ | $\begin{aligned} & 53 \\ & 33 \\ & \hline \end{aligned}$ |  | $\begin{array}{\|c\|} \hline 51 \\ 1 \end{array}$ | $\begin{array}{\|c\|} \hline 14 \\ \hline \end{array}$ | $\begin{aligned} & 9 \\ & 7 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline \mathbf{5 1} \\ 55 \\ \hline \end{array}$ |  | $\begin{array}{r} 52 \\ 1 \\ \hline \end{array}$ | $\begin{array}{\|c\|} \hline 14 \\ 0 \end{array}$ | $\begin{aligned} & 25 \\ & 52 \\ & \hline \end{aligned}$ | $\begin{array}{\|r\|} \hline 18 \\ \hline \end{array}$ |  |
| 22 |  | $\begin{array}{r} 47 \\ 1 \end{array}$ | $\begin{array}{r} 48 \\ 1 \end{array}$ | $\begin{array}{\|l\|} \hline \mathbf{3 1} \\ 48 \\ \hline \end{array}$ | $\begin{aligned} & 4^{6} \\ & 17 \\ & \hline \end{aligned}$ |  | $\begin{array}{r} 49 \\ 1 \end{array}$ | $\begin{gathered} 30 \\ 1 \end{gathered}$ | $\begin{aligned} & 47 \\ & 35 \end{aligned}$ | $\begin{array}{\|l} \hline 38 \\ 51 \\ \hline \end{array}$ |  | $\begin{array}{r} 51 \\ 1 \end{array}$ | $\begin{aligned} & 0 \\ & 1 \end{aligned}$ | $\begin{array}{r} 5 \\ 22 \end{array}$ | $\begin{aligned} & 26 \\ & 19 \end{aligned}$ |  | $\begin{array}{r} 52 \\ 1 \end{array}$ | $\begin{array}{r} 15 \\ 1 \end{array}$ | $\begin{array}{r} 17 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 46 \\ 39 \\ \hline \end{array}$ |  | $53$ | $\begin{array}{r} 15 \\ 0 \end{array}$ | $\begin{aligned} & \mathbf{1 7} \\ & 51 \end{aligned}$ | $\begin{array}{\|l} \mathbf{2 7} \\ 53 \\ \hline \end{array}$ |  |
| 23 |  | $\begin{gathered} 48 \\ 1 \end{gathered}$ | $\begin{gathered} 50 \\ 1 \end{gathered}$ | $\begin{aligned} & 20 \\ & 48 \\ & \hline \end{aligned}$ | $\begin{aligned} & \hline 3 \\ & 4 \\ & \hline \end{aligned}$ |  | $\begin{gathered} 50 \\ 1 \end{gathered}$ | $\begin{array}{r} 32 \\ 1 \end{array}$ | $\begin{aligned} & 23 \\ & 35 \\ & \hline \end{aligned}$ | $\begin{aligned} & \hline 29 \\ & 39 \\ & \hline \end{aligned}$ |  | $\begin{array}{r} 52 \\ 1 \end{array}$ | $\begin{aligned} & 1 \\ & 1 \end{aligned}$ | $\begin{aligned} & 27 \\ & 22 \end{aligned}$ | $\begin{array}{r} 45 \\ 5 \end{array}$ |  | $\begin{array}{r} 53 \\ 1 \end{array}$ | $16$ | $\begin{array}{\|r\|} \hline 25 \\ 7 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 25 \\ 25 \\ \hline \end{array}$ |  | $\begin{array}{r} 54 \\ 1 \end{array}$ | $\begin{gathered} 16 \\ 0 \end{gathered}$ | $\begin{array}{\|r} 9 \\ 51 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 20 \\ 36 \\ \hline \end{array}$ |  |
| 24 |  | $\begin{array}{r} 49 \\ 1 \end{array}$ | $\begin{gathered} 5^{2} \\ 1 \end{gathered}$ | $\begin{array}{\|r} \hline 8 \\ 47 \\ \hline \end{array}$ | $\begin{array}{r} 7 \\ 53 \\ \hline \end{array}$ |  | $\begin{array}{r} 51 \\ 1 \end{array}$ | $\begin{array}{r} 33 \\ 1 \end{array}$ | $\begin{aligned} & 59 \\ & 35 \\ & \hline \end{aligned}$ | $\begin{array}{r} 8 \\ 25 \\ \hline \end{array}$ |  | $\begin{array}{r} 53 \\ 1 \end{array}$ | $2$ | $\begin{array}{\|l} 49 \\ 21 \end{array}$ | $\begin{aligned} & 50 \\ & 51 \\ & \hline \end{aligned}$ |  | $\begin{array}{\|r} 54 \\ 1 \end{array}$ | $\begin{array}{\|r} 17 \\ 1 \end{array}$ | $\begin{array}{r} \mathbf{3 2} \\ 7 \end{array}$ | $\begin{array}{r} 50 \\ 9 \\ \hline \end{array}$ |  | $\begin{array}{r} 55 \\ 1 \end{array}$ | $\begin{array}{r} 17 \\ 0 \end{array}$ | $\begin{array}{r} \mathbf{0} \\ 51 \\ \hline \end{array}$ | $\begin{aligned} & 56 \\ & 20 \end{aligned}$ |  |
| 25 |  | $50$ | $\begin{array}{r} 53 \\ 1 \end{array}$ | $\begin{aligned} & \mathbf{5 6} \\ & 47 \\ & \hline \end{aligned}$ | $\begin{array}{r} 0 \\ 41 \\ \hline 1 \end{array}$ |  | $\begin{array}{r} 52 \\ 1 \end{array}$ | $\begin{array}{r} 35 \\ 1 \end{array}$ | $\begin{aligned} & \mathbf{3 4} \\ & 35 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 33 \\ 13 \\ \hline \end{array}$ |  | $\begin{array}{r} 54 \\ 1 \end{array}$ | $\begin{aligned} & 4 \\ & 1 \end{aligned}$ | $\left\lvert\, \begin{aligned} & 11 \\ & 21 \end{aligned}\right.$ | $\begin{aligned} & \mathbf{4 1} \\ & \mathbf{3 7} \end{aligned}$ |  | $\begin{array}{r} 55 \\ 1 \end{array}$ | $18$ | $\begin{array}{r} 39 \\ 6 \end{array}$ | $\begin{array}{\|l} 59 \\ 54 \\ \hline \end{array}$ |  | $\begin{array}{r} 56 \\ 1 \end{array}$ | $\begin{array}{r} 17 \\ \hline 0 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline \mathbf{5 2}^{2} \\ 51 \\ \hline \end{array}$ | $\begin{array}{r} 16 \\ \hline 4 \\ \hline \end{array}$ |  |
| 26 |  | $\left[\begin{array}{c} 51 \\ 1 \end{array}\right.$ | $\begin{gathered} 55 \\ 1 \end{gathered}$ | $\begin{aligned} & 43 \\ & 47 \end{aligned}$ | $\begin{aligned} & \hline 41 \\ & 29 \\ & \hline \end{aligned}$ |  | $53$ | $\begin{array}{r} 37 \\ 1 \end{array}$ | $\begin{array}{r} 9 \\ 35 \\ \hline \end{array}$ | $\begin{gathered} 46 \\ 0 \end{gathered}$ |  | $\begin{array}{r} 55 \\ 1 \end{array}$ | $5$ | $\begin{array}{\|l\|} \hline 33 \\ 21 \\ \hline \end{array}$ | $\begin{aligned} & 18 \\ & 23 \\ & \hline \end{aligned}$ |  | $\begin{array}{r} 56 \\ \hline 1 \\ \hline \end{array}$ | $\begin{array}{\|r\|} \hline 19 \\ \hline \end{array}$ | $\begin{array}{r} 46 \\ 6 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 53 \\ 38 \\ \hline \end{array}$ |  | $\begin{array}{r} 57 \\ 1 \end{array}$ | $\begin{array}{\|c} 18 \\ \hline 0 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 43 \\ 50 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 20 \\ 48 \\ \hline \end{array}$ |  |
| 27 |  | $\begin{array}{r} 52 \\ 1 \end{array}$ | $\left\|\begin{array}{r} 57 \\ 1 \end{array}\right\|$ | $\begin{array}{\|l} \mathbf{3 1} \\ 47 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 10 \\ 17 \\ \hline \end{array}$ |  | $\begin{gathered} 54 \\ 1 \end{gathered}$ | $\begin{array}{r} 38 \\ 1 \end{array}$ | $\begin{aligned} & 44 \\ & 34 \\ & \hline \end{aligned}$ | $\begin{aligned} & 46 \\ & 46 \\ & \hline \end{aligned}$ |  | $\begin{gathered} 56 \\ 1 \end{gathered}$ | $6$ | $\begin{array}{\|l\|} \mathbf{5 4} \\ 21 \end{array}$ | $\begin{array}{r} 41 \\ 8 \end{array}$ |  | $\begin{array}{\|r} 57 \\ 1 \end{array}$ | 20 | $\begin{array}{r} 53 \\ 6 \end{array}$ | $\begin{array}{\|l} \mathbf{3 1} \\ \mathbf{2 3} \\ \hline \end{array}$ |  | $\begin{array}{r} 58 \\ 1 \end{array}$ | $\begin{array}{r} 19 \\ 0 \end{array}$ | $\begin{array}{\|l\|} \hline \mathbf{3 4} \\ 50 \\ \hline \end{array}$ | $\begin{array}{\|r} \hline 8 \\ 3^{1} \\ \hline \end{array}$ | 7 |
| 28 |  | $\begin{array}{r} 53 \\ 1 \end{array}$ | $\begin{gathered} 59 \\ 1 \end{gathered}$ | $\begin{array}{\|l\|} \hline 18 \\ 47 \\ \hline \end{array}$ | $\begin{array}{r} 27 \\ \hline \\ \hline \end{array}$ |  | $\begin{array}{r} 55 \\ 1 \end{array}$ | $\begin{array}{r} 40 \\ 1 \end{array}$ | $\begin{aligned} & \hline 19 \\ & 34 \\ & \hline \end{aligned}$ | $\begin{aligned} & \hline 3^{2} \\ & 34 \\ & \hline \end{aligned}$ |  | $\begin{array}{r} 57 \\ 1 \end{array}$ | $\begin{aligned} & \hline 8 \\ & 1 \\ & \hline \end{aligned}$ | $\begin{aligned} & 15 \\ & 20 \end{aligned}$ | $\begin{aligned} & 49 \\ & 55 \\ & \hline \end{aligned}$ |  | $\begin{array}{r} 58 \\ 1 \end{array}$ | $\begin{array}{r} 21 \\ \hline 1 \\ \hline \end{array}$ | $\begin{array}{r} 59 \\ 6 \end{array}$ | $\begin{array}{r} 54 \\ 8 \end{array}$ |  | $\begin{array}{r} 59 \\ 1 \end{array}$ | $\begin{gathered} 20 \\ 0 \end{gathered}$ | $\begin{aligned} & 24 \\ & 50 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 39 \\ 14 \\ \hline \end{array}$ |  |
| 29 |  | $\begin{gathered} 55 \\ 1 \end{gathered}$ | $\begin{aligned} & 1 \\ & 1 \end{aligned}$ | $\begin{array}{\|r} 5 \\ 46 \\ \hline \end{array}$ | $\begin{aligned} & 3_{2}^{2} \\ & 53 \\ & \hline \end{aligned}$ |  | $\begin{array}{r} 56 \\ 1 \end{array}$ | $\begin{array}{r} 41 \\ 1 \end{array}$ | $\begin{array}{\|} \mathbf{5 4} \\ 34 \\ \hline \end{array}$ | $\begin{array}{r} 6 \\ 20 \end{array}$ |  | $\begin{array}{r} 58 \\ 1 \end{array}$ | $9$ | $\begin{aligned} & 36 \\ & 20 \end{aligned}$ | $\begin{aligned} & 44 \\ & 40 \\ & \hline \end{aligned}$ |  | $\left\lvert\, \begin{array}{r} 59 \\ 1 \end{array}\right.$ | $\begin{array}{r} 23 \\ 1 \end{array}$ | 6 | $\begin{array}{r} \mathbf{2} \\ 53 \\ \hline \end{array}$ | 15 | $\begin{aligned} & 0 \\ & 1 \end{aligned}$ | $\begin{array}{r} 21 \\ 0 \end{array}$ | $\begin{array}{\|l} \mathbf{1 4} \\ \mathbf{4 9} \\ \hline \end{array}$ | $\begin{array}{\|l} 53 \\ 58 \\ \hline \end{array}$ |  |
| 30 | 10 | $\begin{gathered} 56 \\ 1 \end{gathered}$ | $2$ | $\begin{aligned} & 52 \\ & 46 \end{aligned}$ | $\begin{aligned} & 25 \\ & 41 \end{aligned}$ | 11 | $\begin{array}{r} 57 \\ 1 \end{array}$ | $\begin{array}{r} 43 \\ 1 \end{array}$ | $\begin{aligned} & \mathbf{2 8} \\ & \mathbf{3 4} \end{aligned}$ | $26$ | 12 | $\begin{array}{\|c} 59 \\ 1 \end{array}$ | $\begin{array}{\|r} 10 \\ 1 \end{array}$ | $\begin{array}{\|l} 57 \\ 20 \end{array}$ | $\begin{aligned} & 24 \\ & 26 \end{aligned}$ | 14 | $0$ | $24$ | $\begin{array}{r} \mathbf{1 1} \\ 5 \\ \hline \end{array}$ | $\begin{aligned} & 55 \\ & 37 \end{aligned}$ | 15 | $1$ | $\begin{array}{r} 22 \\ 0 \end{array}$ | $\begin{array}{r} 4 \\ 49 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \mathbf{5 1} \\ \mathbf{4}^{2} \\ \hline \end{array}$ |  |

Bürgi's 1' sine table (reconstruction, D. Roegel, 2016)

| 1 | $10^{\circ}$ |  |  |  |  | $11^{\circ}$ |  |  |  |  | $12^{\circ}$ |  |  |  |  | $13^{\circ}$ |  |  |  |  | $14^{\circ}$ |  |  |  |  | , |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 30 | 10 | $\begin{array}{\|c} 56 \\ 1 \end{array}$ | $\begin{array}{l\|} \hline 2 \\ 1 \end{array}$ | $\begin{aligned} & \hline 52 \\ & 46 \\ & \hline \end{aligned}$ | $\begin{aligned} & 25 \\ & 41 \\ & \hline \end{aligned}$ | 11 | $\begin{array}{r} 57 \\ 1 \end{array}$ | $\begin{array}{r} 43 \\ 1 \end{array}$ | $\begin{array}{\|l\|} \hline 28 \\ 34 \\ \hline \end{array}$ | $\begin{array}{\|r\|} \hline 26 \\ 7 \\ \hline \end{array}$ | 12 | $\begin{array}{r} 59 \\ 1 \end{array}$ | $\begin{array}{\|c\|} \hline 10 \\ 1 \end{array}$ | $\begin{aligned} & 57 \\ & 20 \end{aligned}$ | $\begin{aligned} & 24 \\ & 26 \end{aligned}$ | 14 | $0$ | $\begin{array}{r} 24 \\ 1 \end{array}$ | $\begin{array}{\|r} \hline \mathbf{1 1} \\ \hline \end{array}$ | $55$ | 15 | 1 | $\begin{array}{r} 22 \\ 0 \end{array}$ | $\begin{array}{r} 4 \\ 49 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 51 \\ 42 \\ \hline \end{array}$ | 30 |
| 31 |  | $\begin{array}{r} 57 \\ 1 \end{array}$ | $\begin{aligned} & 4 \\ & 1 \end{aligned}$ | $\begin{aligned} & 39 \\ & 46 \\ & \hline \end{aligned}$ | $\begin{array}{r} 6 \\ 29 \\ \hline \end{array}$ |  | $\begin{gathered} 58 \\ 1 \end{gathered}$ | $\begin{gathered} 45 \\ 1 \end{gathered}$ | $\begin{array}{r} 2 \\ 33 \\ \hline \end{array}$ | $\begin{array}{\|l} 33 \\ 54 \\ \hline \end{array}$ | 13 | $\begin{aligned} & 0 \\ & 1 \end{aligned}$ | $\begin{array}{r} 12 \\ 1 \end{array}$ | $\begin{aligned} & 17 \\ & 20 \end{aligned}$ | $\begin{array}{\|l\|} \hline 50 \\ 11 \end{array}$ |  | 1 | $\begin{array}{r} 25 \\ 1 \end{array}$ | $\begin{array}{r} 17 \\ \hline \end{array}$ | $\begin{aligned} & 3^{2} \\ & 22 \end{aligned}$ |  | 2 | $\begin{gathered} 22 \\ 0 \end{gathered}$ | $\begin{aligned} & \mathbf{5 4} \\ & 49 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 33 \\ 25 \\ \hline \end{array}$ | 31 |
| 32 |  | $\begin{array}{\|r} 58 \\ 1 \end{array}$ | $\begin{aligned} & \hline 6 \\ & 1 \end{aligned}$ | $\begin{aligned} & 25 \\ & 46 \\ & \hline \end{aligned}$ | $\begin{aligned} & 35 \\ & 17 \\ & \hline \end{aligned}$ |  | $\begin{array}{r} 59 \\ 1 \end{array}$ | $\begin{gathered} 46 \\ 1 \end{gathered}$ | $\begin{aligned} & \hline 36 \\ & 33 \\ & \hline \end{aligned}$ | $\begin{aligned} & 27 \\ & 41 \\ & \hline \end{aligned}$ |  | $\begin{aligned} & 1 \\ & 1 \end{aligned}$ | $\begin{array}{\|r\|} \hline 13 \\ 1 \end{array}$ | $\begin{aligned} & 38 \\ & 19 \\ & \hline \end{aligned}$ | $\begin{array}{r} \mathbf{1} \\ 57 \\ \hline \end{array}$ |  | $2$ | $\begin{array}{r} 26 \\ 1 \end{array}$ | $\begin{array}{r} 22 \\ 5 \end{array}$ | $\begin{array}{r} 54 \\ \hline \end{array}$ |  | $\begin{aligned} & 3 \\ & 1 \end{aligned}$ | $\begin{array}{r} 23 \\ 0 \end{array}$ | $\begin{aligned} & 43 \\ & 49 \\ & \hline \end{aligned}$ | $\begin{array}{r} 58 \\ 8 \end{array}$ | 32 |
| 33 |  | $\begin{array}{\|r} 59 \\ 1 \end{array}$ | $\begin{aligned} & \hline 8 \\ & 1 \end{aligned}$ | $\begin{array}{\|l\|} \hline 11 \\ 46 \\ \hline \end{array}$ | $\begin{array}{r} 52 \\ 5 \\ \hline \end{array}$ | 12 | $0$ | $\begin{array}{r} 48 \\ 1 \end{array}$ | $\begin{array}{\|l} 10 \\ 33 \\ \hline \end{array}$ | $\begin{array}{r} 8 \\ 28 \\ \hline \end{array}$ |  | $2$ | $14$ | $\begin{array}{\|l} 57 \\ 19 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 58 \\ 43 \\ \hline \end{array}$ |  | $3$ | $\begin{array}{r} 27 \\ 1 \end{array}$ | $\begin{array}{r} 28 \\ \hline \end{array}$ | 0 51 |  | $4$ | $\begin{gathered} 24 \\ 0 \end{gathered}$ | $\begin{aligned} & \hline 33 \\ & 48 \\ & \hline \end{aligned}$ | $\begin{array}{r} 6 \\ 53 \\ \hline \end{array}$ | 33 |
| 34 | 11 | $\mathbf{0}$ | $\begin{aligned} & 9 \\ & 1 \end{aligned}$ | $\begin{array}{\|l} 57 \\ 45 \\ \hline \end{array}$ | $\begin{aligned} & 57 \\ & 52 \\ & \hline \end{aligned}$ |  | $\begin{aligned} & 1 \\ & 1 \end{aligned}$ | $\begin{array}{r} 49 \\ 1 \end{array}$ | $\begin{aligned} & 43 \\ & 33 \\ & \hline \end{aligned}$ | $\begin{aligned} & \hline 36 \\ & 14 \\ & \hline \end{aligned}$ |  | $\begin{aligned} & 3 \\ & 1 \end{aligned}$ | $\begin{gathered} 16 \\ 1 \end{gathered}$ | $\begin{array}{\|l} 17 \\ 19 \\ \hline \end{array}$ | $\begin{array}{\|l} 41 \\ 29 \\ \hline \end{array}$ |  | $4$ | $\begin{array}{r} 28 \\ 1 \end{array}$ | $\begin{array}{r} 3^{2} \\ 4 \\ \hline \end{array}$ | $\begin{array}{\|l\|l\|} \mathbf{5 1} \\ \mathbf{3 6} \\ \hline \end{array}$ |  | $5$ | $\begin{array}{r} 25 \\ 0 \end{array}$ | $\begin{array}{r} 21 \\ 48 \\ \hline \end{array}$ | $\begin{array}{\|} 59 \\ 35 \\ \hline \end{array}$ | 34 |
| 35 |  | $\begin{array}{l\|} 1 \\ 1 \end{array}$ | $\begin{array}{\|r\|} \hline 11 \\ 1 \end{array}$ | $\begin{aligned} & 43 \\ & 45 \\ & \hline \end{aligned}$ | $\begin{aligned} & 49 \\ & 41 \end{aligned}$ |  | $\begin{aligned} & 2 \\ & 1 \end{aligned}$ | $\begin{array}{r} 5^{1} \\ 1 \end{array}$ | $\begin{aligned} & 16 \\ & 33 \\ & \hline \end{aligned}$ | $\begin{gathered} 50 \\ 1 \end{gathered}$ |  | $\begin{aligned} & 4 \\ & 1 \end{aligned}$ | $\begin{array}{r} 17 \\ \hline 1 \end{array}$ | $\begin{array}{\|l} \hline 37 \\ 19 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 10 \\ 15 \\ \hline \end{array}$ |  | $\begin{aligned} & 5 \\ & 1 \end{aligned}$ | $\begin{array}{r} 29 \\ 1 \end{array}$ | $\begin{array}{r} 37 \\ \hline 4 \\ \hline \end{array}$ | $\begin{aligned} & 27 \\ & 20 \end{aligned}$ |  | $6$ | $\begin{array}{\|r\|} \hline 26 \\ 0 \\ \hline \end{array}$ | $\begin{aligned} & \hline 10 \\ & 48 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 34 \\ 19 \\ \hline \end{array}$ | 35 |
| 36 |  | $\begin{aligned} & \mathbf{2} \\ & \mathbf{1} \end{aligned}$ | $\begin{array}{\|r\|} \hline 13 \\ 1 \end{array}$ | $\begin{aligned} & 29 \\ & 45 \\ & \hline \end{aligned}$ | $\begin{aligned} & 30 \\ & 29 \\ & \hline \end{aligned}$ |  | $\begin{aligned} & 3 \\ & 1 \end{aligned}$ | $\begin{array}{r} 5^{2} \\ 1 \end{array}$ | $\begin{aligned} & 49 \\ & 32 \end{aligned}$ | $\begin{aligned} & \mathbf{5 1} \\ & \mathbf{4 9} \\ & \hline \end{aligned}$ |  | $\begin{aligned} & 5 \\ & 1 \end{aligned}$ | $\begin{array}{r} 18 \\ 1 \end{array}$ | $\begin{array}{\|l} \hline 56 \\ 19 \\ \hline \end{array}$ | $\begin{array}{r} 25 \\ 0 \end{array}$ |  | $6$ | $\begin{gathered} 30 \\ 1 \end{gathered}$ | $\begin{array}{r} 41 \\ \hline \end{array}$ | $\begin{array}{r} 47 \\ \hline \end{array}$ |  | $\begin{aligned} & 7 \\ & 1 \end{aligned}$ | $\begin{array}{r} 26 \\ 0 \end{array}$ | $\begin{aligned} & 58 \\ & 48 \\ & \hline \end{aligned}$ | $\begin{array}{r} 53 \\ 2 \end{array}$ | 36 |
| 37 |  | $\begin{aligned} & 3 \\ & 1 \end{aligned}$ | $\begin{array}{\|r\|} \hline 15 \\ 1 \end{array}$ | $\begin{array}{\|l\|} \hline 14 \\ 45 \\ \hline \end{array}$ | $\begin{aligned} & 59 \\ & 16 \end{aligned}$ |  | $\begin{aligned} & 4 \\ & 1 \end{aligned}$ | $\begin{gathered} 54 \\ 1 \end{gathered}$ | $\begin{aligned} & 22 \\ & 32 \\ & \hline \end{aligned}$ | $\begin{aligned} & 40 \\ & 34 \end{aligned}$ |  | $\begin{aligned} & \hline 6 \\ & 1 \end{aligned}$ | $\begin{array}{r} 20 \\ 1 \end{array}$ | $\begin{aligned} & 15 \\ & 18 \end{aligned}$ | $\begin{array}{\|l} 25 \\ 45 \\ \hline \end{array}$ |  | $\begin{aligned} & 7 \\ & 1 \end{aligned}$ | $\begin{array}{r} 31 \\ 1 \end{array}$ | $\begin{gathered} 45 \\ 3 \end{gathered}$ | $\begin{array}{\|l} \mathbf{5}^{2} \\ 49 \\ \hline \end{array}$ |  | $8$ | $\begin{array}{r} 27 \\ 0 \end{array}$ | $\begin{aligned} & 46 \\ & 47 \\ & \hline \end{aligned}$ | $\begin{aligned} & 55 \\ & 46 \end{aligned}$ | 37 |
| $3^{8}$ |  | $\begin{aligned} & 4 \\ & 1 \end{aligned}$ | $\begin{array}{r} 17 \\ \hline 1 \end{array}$ | $\begin{array}{r} \mathrm{o} \\ 45 \end{array}$ | $\begin{array}{r} 15 \\ 5 \\ \hline \end{array}$ |  | $\begin{aligned} & 5 \\ & 1 \end{aligned}$ | $\begin{array}{r} 55 \\ 1 \end{array}$ | $\begin{aligned} & 55 \\ & 3^{2} \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 14 \\ 22 \end{array}$ |  | $\begin{aligned} & 7 \\ & 1 \end{aligned}$ | $\begin{array}{\|r\|} \hline 21 \\ 1 \end{array}$ | $\begin{aligned} & 34 \\ & 18 \end{aligned}$ | $\begin{aligned} & \hline 10 \\ & 31 \\ & \hline \end{aligned}$ |  | $8$ | $\begin{array}{r} 32 \\ 1 \end{array}$ | $\begin{array}{r} 49 \\ 3 \end{array}$ | $\begin{aligned} & \mathbf{4 1} \\ & \mathbf{3 4} \end{aligned}$ |  | $\begin{aligned} & 9 \\ & 1 \end{aligned}$ | $\begin{gathered} 28 \\ 0 \end{gathered}$ | $34$ | $\begin{array}{\|l\|} \hline \mathbf{4 1} \\ \mathbf{2 9} \\ \hline \end{array}$ | $3^{8}$ |
| 39 |  | $\begin{aligned} & 5 \\ & 1 \end{aligned}$ | $\begin{array}{r} 18 \\ 1 \end{array}$ | $\begin{array}{\|l} 45 \\ 44 \\ \hline \end{array}$ | $\begin{aligned} & 20 \\ & 52 \end{aligned}$ |  | $\begin{aligned} & \hline 6 \\ & 1 \end{aligned}$ | $\begin{array}{r} 57 \\ 1 \end{array}$ | $\begin{aligned} & 27 \\ & 32 \\ & \hline \end{aligned}$ | $\begin{array}{r} 36 \\ 8 \end{array}$ |  | $8$ | $\left.\begin{array}{r} 22 \\ 1 \end{array} \right\rvert\,$ | $\begin{aligned} & 52 \\ & 18 \end{aligned}$ | $\begin{array}{\|l} \mathbf{4 1} \\ \mathbf{1 7} \\ \hline \end{array}$ |  | $9$ | $\begin{array}{r} 33 \\ 1 \end{array}$ | $\begin{array}{\|r} 53 \\ 3 \\ \hline \end{array}$ | $\begin{aligned} & 15 \\ & 18 \end{aligned}$ |  | $\begin{array}{r} 10 \\ 1 \end{array}$ | $\begin{array}{r} 29 \\ 0 \end{array}$ | $\begin{aligned} & \mathbf{2 2} \\ & 47 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 10 \\ 13 \\ \hline \end{array}$ | 39 |
| 40 | 11 | $6$ | $\begin{array}{r} 20 \\ 1 \end{array}$ | $\begin{array}{\|l\|} \hline 30 \\ 44 \\ \hline \end{array}$ | $\begin{aligned} & 12 \\ & 40 \end{aligned}$ | 12 | $\begin{aligned} & 7 \\ & 1 \end{aligned}$ | $\begin{array}{r} 58 \\ 1 \end{array}$ | $\begin{aligned} & 59 \\ & 31 \\ & \hline \end{aligned}$ | $\begin{aligned} & 44 \\ & 55 \\ & \hline \end{aligned}$ | 13 | $9$ | $24$ | $\begin{aligned} & 10 \\ & 18 \end{aligned}$ | $58$ | 14 | $10$ | $\begin{array}{r} 34 \\ 1 \end{array}$ | $\begin{array}{r} 56 \\ 3 \end{array}$ | $33$ | 15 | $\begin{array}{r} 11 \\ 1 \end{array}$ | $\begin{gathered} 30 \\ 0 \end{gathered}$ | $\begin{array}{r} 9 \\ 46 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 23 \\ 56 \\ \hline \end{array}$ | 40 |
| 41 |  | $\begin{aligned} & 7 \\ & 1 \end{aligned}$ | $\begin{array}{r} 22 \\ 1 \end{array}$ | $\begin{array}{\|l\|} \hline \mathbf{1 4} \\ 44 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{5 2} \\ & 28 \end{aligned}$ |  | $9$ | $0$ | $\begin{aligned} & 3^{1} \\ & 3^{1} \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 39 \\ 4^{2} \\ \hline \end{array}$ |  | $\begin{array}{r} 10 \\ 1 \end{array}$ | $\begin{array}{r} 25 \\ 1 \end{array}$ | $\begin{array}{\|l} \hline 29 \\ 17 \\ \hline \end{array}$ | $\begin{array}{r} 18 \\ 48 \\ \hline \end{array}$ |  | 11 1 | $\begin{array}{r} 35 \\ 1 \end{array}$ | $\begin{array}{r} 59 \\ 2 \end{array}$ | $\begin{aligned} & 35 \\ & 47 \end{aligned}$ |  | $\begin{array}{r} 12 \\ 1 \end{array}$ | $\begin{array}{r} 30 \\ 0 \end{array}$ | $\begin{array}{\|l} \hline 56 \\ 46 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 19 \\ 39 \\ \hline \end{array}$ | 41 |
| 42 |  | $\begin{aligned} & 8 \\ & 1 \end{aligned}$ | $\left.\begin{array}{r} 23 \\ 1 \end{array} \right\rvert\,$ | $\begin{array}{\|l} 59 \\ 44 \\ \hline \end{array}$ | $\begin{aligned} & 20 \\ & 16 \end{aligned}$ |  | $\begin{array}{r} 10 \\ 1 \end{array}$ | $2$ | $\begin{array}{\|r} 3 \\ 31 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 21 \\ 28 \end{array}$ |  | $11$ | $\begin{array}{r} 26 \\ 1 \end{array}$ | $\begin{aligned} & 46 \\ & 17 \end{aligned}$ | $\begin{aligned} & 49 \\ & 33 \\ & \hline \end{aligned}$ |  | 12 | $\begin{array}{r} 37 \\ 1 \end{array}$ | $2$ | $\begin{array}{\|l} \hline \mathbf{2 2} \\ 32 \\ \hline \end{array}$ |  | $\begin{array}{r} 13 \\ \hline 1 \end{array}$ | $\begin{gathered} 3^{1} \\ 0 \end{gathered}$ | $\begin{aligned} & \hline 42 \\ & 46 \\ & \hline \end{aligned}$ | $\begin{aligned} & 58 \\ & 22 \end{aligned}$ | 42 |
| 43 |  | $9$ | $\begin{gathered} 25 \\ 1 \end{gathered}$ | $\begin{array}{\|l\|} \hline 43 \\ 44 \\ \hline \end{array}$ | $\begin{array}{\|c\|} \hline \mathbf{3 6} \\ 3 \\ \hline \end{array}$ |  | $\begin{array}{r} 11 \\ 1 \end{array}$ | $\begin{aligned} & 3 \\ & 1 \end{aligned}$ | $\begin{aligned} & 34 \\ & 31 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 49 \\ 15 \\ \hline \end{array}$ |  | $12$ | $\begin{array}{\|r\|} \hline 28 \\ 1 \\ \hline \end{array}$ | $\begin{array}{r} 4 \\ 17 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 22 \\ 19 \\ \hline \end{array}$ |  | $13$ | $\begin{array}{r} 38 \\ 1 \end{array}$ | $\begin{aligned} & 4 \\ & 2 \end{aligned}$ | $\begin{aligned} & \mathbf{5 4} \\ & 16 \end{aligned}$ |  | $\begin{array}{r} 14 \\ 1 \end{array}$ | $\begin{gathered} 32 \\ 0 \end{gathered}$ | $\begin{array}{r} 29 \\ 46 \\ \hline \end{array}$ | $\begin{array}{r} 20 \\ 6 \end{array}$ | 43 |
| 44 |  | $\begin{array}{r} 10 \\ \hline 1 \end{array}$ | $\begin{array}{r} 27 \\ 1 \end{array}$ | $\begin{array}{\|l} \mathbf{2 7} \\ 43 \\ \hline \end{array}$ | $\begin{aligned} & 39 \\ & 51 \\ & \hline \end{aligned}$ |  | $\begin{array}{r} 12 \\ 1 \end{array}$ | $\begin{aligned} & 5 \\ & 1 \end{aligned}$ | $\begin{array}{r} 6 \\ 31 \\ \hline \end{array}$ | $\begin{aligned} & 4 \\ & 2 \end{aligned}$ |  | $\begin{array}{r} 13 \\ 1 \end{array}$ | $\begin{array}{\|r\|} \hline 29 \\ 1 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 21 \\ 17 \\ \hline \end{array}$ | $\begin{array}{r} 41 \\ \hline 4 \\ \hline \end{array}$ |  | $14$ | $\begin{array}{r} 39 \\ 1 \end{array}$ | $\begin{aligned} & 7 \\ & 2 \end{aligned}$ | $\begin{array}{r} 10 \\ 0 \end{array}$ |  | $15$ | $\begin{array}{r} 33 \\ 0 \end{array}$ | $\begin{aligned} & \hline 15 \\ & 45 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline \mathbf{2 6} \\ 49 \\ \hline \end{array}$ | 44 |
| 45 |  | $\begin{array}{\|r} 11 \\ 1 \end{array}$ | $\begin{array}{r} 29 \\ 1 \end{array}$ | $\begin{array}{\|l\|} \mathbf{1 1} \\ 43 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 30 \\ 39 \\ \hline \end{array}$ |  | $\begin{array}{r} 13 \\ 1 \end{array}$ | $\begin{aligned} & \hline 6 \\ & 1 \end{aligned}$ | $\begin{array}{\|l} 37 \\ 30 \\ \hline \end{array}$ | $\begin{array}{r} 6 \\ 48 \\ \hline \end{array}$ |  | $\begin{array}{\|c\|} 14 \\ 1 \end{array}$ | $\begin{gathered} 30 \\ 1 \end{gathered}$ | $\begin{aligned} & 38 \\ & 16 \\ & \hline \end{aligned}$ | $\begin{aligned} & 45 \\ & 50 \\ & \hline \end{aligned}$ |  | $15$ | $\begin{array}{r} 40 \\ 1 \end{array}$ | $9$ | $\begin{array}{\|l\|} \hline 10 \\ 44 \\ \hline \end{array}$ |  | $\begin{array}{r} 16 \\ 1 \end{array}$ | $\begin{array}{r} 34 \\ 0 \end{array}$ | $\begin{array}{r} \mathbf{1} \\ 45 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 15 \\ 32 \\ \hline \end{array}$ | 45 |
| 46 |  | $12$ | $\begin{gathered} 30 \\ 1 \end{gathered}$ | $\begin{array}{\|l\|} \hline 55 \\ 43 \\ \hline \end{array}$ | $\begin{array}{r} 9 \\ 27 \\ \hline \end{array}$ |  | $\left.\begin{array}{r} 14 \\ 1 \end{array} \right\rvert\,$ | $\begin{aligned} & \hline 8 \\ & 1 \end{aligned}$ | $\begin{array}{r} 7 \\ 30 \end{array}$ | $\begin{aligned} & \mathbf{5 4} \\ & 35 \\ & \hline \end{aligned}$ |  | $\begin{array}{r} 15 \\ 1 \end{array}$ | $31$ | $\begin{aligned} & 55 \\ & 16 \end{aligned}$ | $\begin{aligned} & 35 \\ & 36 \\ & \hline \end{aligned}$ |  | $\begin{array}{r} 16 \\ 1 \end{array}$ | $\begin{array}{r} 41 \\ 1 \end{array}$ | $\begin{array}{r} 10 \\ 1 \end{array}$ | $\begin{array}{\|l} 54 \\ 29 \\ \hline \end{array}$ |  | $\begin{array}{r} 17 \\ \hline 1 \end{array}$ | $\begin{array}{r} 34 \\ 0 \end{array}$ | $\begin{aligned} & 46 \\ & 45 \\ & \hline \end{aligned}$ | $\begin{aligned} & 47 \\ & 16 \end{aligned}$ | 46 |
| 47 |  | $\begin{array}{\|r} 13 \\ 1 \end{array}$ | $\begin{gathered} 32 \\ 1 \end{gathered}$ | $\begin{array}{\|l\|} \hline 38 \\ 43 \\ \hline \end{array}$ | $\begin{aligned} & \hline 36 \\ & 14 \\ & \hline \end{aligned}$ |  | $\begin{array}{r} 15 \\ 1 \end{array}$ | $\begin{aligned} & \hline 9 \\ & 1 \end{aligned}$ | $\begin{aligned} & 3^{8} \\ & 3^{0} \end{aligned}$ | $\begin{array}{\|l\|} \hline 29 \\ 21 \end{array}$ |  | $\begin{array}{r} 16 \\ 1 \end{array}$ | $\begin{array}{\|r\|} \hline 33 \\ 1 \\ \hline \end{array}$ | $\begin{aligned} & 12 \\ & 16 \\ & \hline \end{aligned}$ | $\begin{aligned} & 11 \\ & 21 \end{aligned}$ |  | $\begin{array}{r} 17 \\ \hline 1 \end{array}$ | $\begin{array}{r} 42 \\ 1 \end{array}$ | $\begin{array}{r} 12 \\ 1 \end{array}$ | $\begin{array}{\|l\|} \hline 23 \\ 14 \\ \hline \end{array}$ |  | $\begin{array}{r} 18 \\ \hline 1 \end{array}$ | $\begin{array}{r} 35 \\ 0 \\ \hline \end{array}$ | $\begin{aligned} & \hline \mathbf{3 2}^{2} \\ & 44 \\ & \hline \end{aligned}$ | $\begin{array}{r} 3 \\ 58 \\ \hline \end{array}$ | 47 |
| 48 |  | $\begin{gathered} 14 \\ 1 \end{gathered}$ | $\left[\begin{array}{c} 34 \\ 1 \end{array}\right.$ | $\begin{aligned} & \mathbf{2 1} \\ & 43 \end{aligned}$ | $\begin{array}{r} 50 \\ 2 \end{array}$ |  | $\begin{array}{\|r\|} 16 \\ 1 \end{array}$ | $\begin{array}{\|r} 11 \\ 1 \end{array}$ | $\begin{array}{r} 8 \\ 30 \\ \hline \end{array}$ | $\begin{array}{r} 50 \\ 8 \end{array}$ |  | $\begin{array}{r} 17 \\ 1 \end{array}$ | $\begin{array}{r} 34 \\ 1 \end{array}$ | $\begin{aligned} & 28 \\ & 16 \end{aligned}$ | $\begin{array}{r} 32 \\ 6 \end{array}$ |  | $\begin{array}{r} 18 \\ 1 \end{array}$ | $\begin{array}{r} 43 \\ 1 \end{array}$ | $\begin{array}{r} 13 \\ 0 \end{array}$ | $\begin{array}{\|l} \mathbf{3 7} \\ 57 \\ \hline \end{array}$ |  | $\begin{array}{r} 19 \\ 1 \end{array}$ | $\begin{gathered} 36 \\ 0 \end{gathered}$ | $\begin{aligned} & \mathbf{1 7} \\ & \mathbf{4 4} \\ & \hline \end{aligned}$ | $\begin{array}{r} 1 \\ 42 \end{array}$ | 48 |
| 49 |  | $\begin{array}{r} 15 \\ 1 \end{array}$ | $\begin{gathered} 36 \\ 1 \end{gathered}$ | $\begin{array}{\|r\|} \hline 4 \\ 42 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{5 2} \\ & 50 \end{aligned}$ |  | $\begin{array}{r} 17 \\ 17 \end{array}$ | $\begin{array}{r} 12 \\ 1 \end{array}$ | $\begin{aligned} & 38 \\ & 29 \end{aligned}$ | $\begin{aligned} & 58 \\ & 54 \\ & \hline \end{aligned}$ |  | $\begin{array}{r} 18 \\ 1 \end{array}$ | $\begin{array}{r} 35 \\ 1 \end{array}$ | $\begin{array}{\|l\|} \hline 44 \\ 15 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 38 \\ 52 \\ \hline \end{array}$ |  | $\begin{array}{r} 19 \\ 1 \end{array}$ | $\begin{gathered} 44 \\ 1 \end{gathered}$ | $\begin{array}{r} 14 \\ 0 \end{array}$ | $\begin{aligned} & \hline \mathbf{3 4} \\ & \mathbf{4}^{2} \end{aligned}$ |  | $\begin{array}{r} 20 \\ 1 \end{array}$ | $\begin{array}{r} 37 \\ 0 \end{array}$ | $\begin{array}{r} 1 \\ 44 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 43 \\ 25 \\ \hline \end{array}$ | 49 |
| 50 | 11 | $\begin{array}{\|r} 16 \\ 1 \end{array}$ | $\left[\begin{array}{r} 37 \\ 1 \end{array}\right.$ | $\begin{aligned} & 47 \\ & 42 \end{aligned}$ | $\begin{array}{\|l} \hline \mathbf{4 2}^{2} \\ 37 \\ \hline \end{array}$ | 12 | $\begin{gathered} 18 \\ 1 \end{gathered}$ | $\begin{gathered} 14 \\ 1 \end{gathered}$ | $\begin{array}{r} 8 \\ 29 \\ \hline \end{array}$ | $\begin{array}{\|l} 52 \\ 41 \end{array}$ | 13 | $\begin{array}{\|r} 19 \\ 1 \end{array}$ | $\begin{array}{r} 37 \\ 1 \end{array}$ | $\begin{array}{r} \mathbf{0} \\ 15 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 30 \\ 37 \\ \hline \end{array}$ | 14 | $\begin{array}{\|r} 20 \\ 1 \end{array}$ | $\begin{array}{r} 45 \\ 1 \end{array}$ | $\begin{array}{r} 15 \\ 0 \end{array}$ | $\begin{aligned} & 16 \\ & 26 \end{aligned}$ | 15 | $\begin{array}{r} 21 \\ 1 \end{array}$ | $\begin{array}{r} 37 \\ 0 \end{array}$ | $\begin{array}{r} 46 \\ 44 \\ \hline \end{array}$ | $\begin{aligned} & 8 \\ & 9 \end{aligned}$ | 50 |
| 51 |  | $\begin{array}{r} 17 \\ 1 \end{array}$ | $\begin{array}{r} 39 \\ 1 \end{array}$ | $\begin{array}{\|l\|} \hline 30 \\ 42 \\ \hline \end{array}$ | $\begin{aligned} & 19 \\ & 25 \\ & \hline \end{aligned}$ |  | $19$ | $\begin{array}{r} 15 \\ 1 \end{array}$ | $\begin{aligned} & 38 \\ & 29 \end{aligned}$ | $\begin{aligned} & 33 \\ & 27 \\ & \hline \end{aligned}$ |  | $\begin{array}{r} 20 \\ 1 \end{array}$ | $3^{8}$ | $\begin{array}{\|l\|} \hline 16 \\ 15 \\ \hline \end{array}$ | $\begin{array}{r} 7 \\ 22 \end{array}$ |  | $21$ | $\begin{array}{r} 46 \\ 1 \end{array}$ | $\begin{array}{r} 15 \\ 0 \end{array}$ | $\begin{array}{\|l} 42 \\ 10 \end{array}$ |  | $22$ | $\begin{gathered} 38 \\ 0 \end{gathered}$ | $\begin{aligned} & \hline 30 \\ & 43 \\ & \hline \end{aligned}$ | $\begin{aligned} & 17 \\ & 51 \\ & \hline \end{aligned}$ | 51 |
| 52 |  | $\begin{array}{\|r} \hline 18 \\ 1 \end{array}$ | $\begin{gathered} 41 \\ 1 \end{gathered}$ | $\begin{aligned} & 12 \\ & 42 \end{aligned}$ | $\begin{array}{\|l\|} \hline 44 \\ 12 \end{array}$ |  | $\begin{array}{r} 20 \\ 1 \end{array}$ | $\begin{array}{r} 17 \\ 1 \end{array}$ | $\begin{array}{r} 8 \\ 29 \\ \hline \end{array}$ | $\begin{array}{r} 0 \\ 14 \\ \hline \end{array}$ |  | $\begin{array}{\|r} 21 \\ 1 \end{array}$ | $\begin{array}{r} 39 \\ 1 \end{array}$ | $\begin{array}{\|l\|} \hline \mathbf{3 1} \\ \mathbf{1 5} \\ \hline \end{array}$ | $\begin{array}{r} 29 \\ 8 \end{array}$ |  | $22$ | $\begin{array}{r} 47 \\ 0 \end{array}$ | $\begin{array}{\|l} \mathbf{1 5} \\ 59 \end{array}$ | $\begin{aligned} & \mathbf{5 2} \\ & 55 \\ & \hline \end{aligned}$ |  | $\begin{array}{r} 23 \\ 1 \end{array}$ | $\left\lvert\, \begin{array}{r} 39 \\ 0 \end{array}\right.$ | $\begin{aligned} & \mathbf{1 4} \\ & 43 \end{aligned}$ | $\begin{array}{r} 8 \\ 34 \\ \hline \end{array}$ | 52 |
| 53 |  | $\begin{array}{r} 19 \\ 1 \end{array}$ | $\begin{gathered} 42 \\ 1 \end{gathered}$ | $\begin{array}{\|l\|} \hline 54 \\ 42 \\ \hline \end{array}$ | $\begin{gathered} 56 \\ 0 \end{gathered}$ |  | $21$ | $\begin{array}{r} 18 \\ \hline 1 \\ \hline \end{array}$ | $\begin{aligned} & 37 \\ & 29 \end{aligned}$ | $\begin{array}{\|r\|} \hline 14 \\ 1 \end{array}$ |  | $22$ | $\begin{gathered} 40 \\ 1 \end{gathered}$ | $\begin{aligned} & 4^{6} \\ & 14 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 37 \\ 53 \\ \hline \end{array}$ |  | $23$ | $\begin{array}{r} 48 \\ 0 \end{array}$ | $\begin{array}{\|l\|} \hline 15 \\ 59 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 47 \\ 39 \\ \hline \end{array}$ |  | $24$ | $\begin{array}{r} 39 \\ 0 \\ \hline \end{array}$ | $\begin{aligned} & \hline 57 \\ & 43 \\ & \hline \end{aligned}$ | $\begin{aligned} & 42 \\ & 18 \end{aligned}$ | 53 |
| 54 |  | $\begin{array}{\|r} 20 \\ 1 \end{array}$ | $\left[\begin{array}{c} 44 \\ 1 \end{array}\right.$ | $\begin{aligned} & 36 \\ & 41 \end{aligned}$ | $\begin{aligned} & 56 \\ & 48 \end{aligned}$ |  | $22$ | $\begin{array}{r} 20 \\ 1 \end{array}$ | $\begin{array}{r} 6 \\ 28 \\ \hline \end{array}$ | $\begin{aligned} & 15 \\ & \hline 46 \end{aligned}$ |  | $\begin{array}{\|c} 23 \\ 1 \end{array}$ | $\begin{gathered} 42 \\ 1 \end{gathered}$ | $\begin{array}{\|r} 1 \\ 14 \\ \hline \end{array}$ | $\begin{array}{\|l} 30 \\ 39 \\ \hline \end{array}$ |  | $\begin{array}{\|c} 24 \\ 1 \end{array}$ | $\begin{gathered} 49 \\ 0 \end{gathered}$ | $\begin{aligned} & \mathbf{1 5} \\ & 59 \end{aligned}$ | $\begin{array}{\|l} \hline 26 \\ 23 \\ \hline \end{array}$ |  | $\begin{array}{r} 25 \\ 1 \end{array}$ | $\begin{gathered} 40 \\ 0 \end{gathered}$ | $\begin{aligned} & 41 \\ & 43 \\ & \hline \end{aligned}$ | O | 54 |
| 55 |  | $\begin{array}{r} 21 \\ 1 \end{array}$ | $\begin{gathered} 46 \\ 1 \end{gathered}$ | $\begin{array}{\|l\|} \hline 18 \\ 41 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 44 \\ 35 \\ \hline \end{array}$ |  | $\begin{array}{r} 23 \\ 1 \end{array}$ | $\begin{array}{r} 21 \\ 1 \end{array}$ | $\begin{aligned} & 35 \\ & 28 \end{aligned}$ | $\begin{array}{\|r} \mathbf{1} \\ 33 \\ \hline \end{array}$ |  | $\begin{array}{r} 24 \\ 1 \end{array}$ | $\begin{gathered} 43 \\ 1 \end{gathered}$ | $\begin{array}{\|l\|} \hline 16 \\ 14 \\ \hline \end{array}$ | $\begin{array}{\|r} 9 \\ 23 \\ \hline \end{array}$ |  | $\begin{array}{r} 25 \\ 1 \end{array}$ | $\begin{gathered} 50 \\ 0 \end{gathered}$ | $\begin{array}{\|l\|} \hline \mathbf{1 4} \\ 59 \\ \hline \end{array}$ | $\begin{array}{r} 49 \\ \hline \end{array}$ |  | $\begin{array}{r} 26 \\ 1 \end{array}$ | $\begin{gathered} 41 \\ 0 \end{gathered}$ | $\begin{aligned} & \hline 24 \\ & 42 \\ & \hline \end{aligned}$ | $\begin{array}{\|r} \hline \mathbf{1} \\ 43 \\ \hline \end{array}$ | 55 |
| 56 |  | $\begin{array}{\|r} 22 \\ 1 \end{array}$ | $\begin{array}{r} 48 \\ 1 \end{array}$ | $\begin{array}{\|r} \hline 0 \\ 41 \\ \hline \end{array}$ | $\begin{aligned} & 19 \\ & 23 \\ & \hline \end{aligned}$ |  | $\left.\begin{array}{r} 24 \\ 1 \end{array} \right\rvert\,$ | $\begin{array}{\|c} 23 \\ 1 \end{array}$ | $\begin{array}{r} 3 \\ 28 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 34 \\ 20 \\ \hline \end{array}$ |  | $\begin{gathered} 25 \\ 1 \end{gathered}$ | $\begin{gathered} 44 \\ 1 \end{gathered}$ | $\begin{array}{\|l\|} \hline 30 \\ 14 \\ \hline \end{array}$ | $\begin{array}{r} 32 \\ \hline 9 \\ \hline \end{array}$ |  | $\begin{array}{r} 26 \\ 1 \end{array}$ | $\begin{gathered} 51 \\ 0 \end{gathered}$ | $\begin{array}{\|l} 13 \\ 58 \\ \hline \end{array}$ | $\begin{aligned} & 56 \\ & 51 \\ & \hline \end{aligned}$ |  | $\begin{array}{r} 27 \\ \hline 1 \end{array}$ | $\begin{gathered} 42 \\ 0 \end{gathered}$ | $\begin{array}{r} 6 \\ 42 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 44 \\ 27 \\ \hline \end{array}$ | 56 |
| 57 |  | $23$ | $\begin{array}{r} 49 \\ 1 \end{array}$ | $\begin{array}{\|l} \hline 41 \\ 41 \\ \hline \end{array}$ | $\begin{aligned} & 42 \\ & 10 \end{aligned}$ |  | $\begin{array}{r} 25 \\ 1 \end{array}$ | $\begin{array}{\|c} 24 \\ 1 \end{array}$ | $\begin{aligned} & \mathbf{3 1} \\ & \mathbf{2 1} \end{aligned}$ | $\begin{array}{r} 54 \\ 6 \end{array}$ |  | $\begin{array}{r} 26 \\ 1 \end{array}$ | $\begin{array}{r} 45 \\ 1 \end{array}$ | $\begin{array}{\|l\|} \hline 44 \\ 13 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline \mathbf{4 1} \\ 55 \\ \hline \end{array}$ |  | $\begin{array}{r} 27 \\ \hline 1 \end{array}$ | $\begin{gathered} 52 \\ 0 \end{gathered}$ | $\begin{array}{\|l} \hline 12 \\ 58 \\ \hline \end{array}$ | $\begin{array}{\|l} 47 \\ 36 \\ \hline \end{array}$ |  | $\begin{array}{r} 28 \\ 1 \end{array}$ | $\begin{gathered} 42 \\ 0 \end{gathered}$ | $\begin{aligned} & 49 \\ & 42 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 11 \\ 10 \\ \hline \end{array}$ | 57 |
| 58 |  | $\begin{array}{\|r\|} \hline 24 \\ 1 \end{array}$ | $\begin{array}{\|c\|} \hline 51 \\ 1 \end{array}$ | $\begin{aligned} & 22 \\ & 40 \\ & \hline \end{aligned}$ | $\begin{aligned} & \mathbf{5 2} \\ & 58 \\ & \hline \end{aligned}$ |  | $\begin{array}{r} 26 \\ 1 \\ \hline \end{array}$ | $\begin{array}{r} 26 \\ 1 \\ \hline \end{array}$ |  | $\begin{array}{r} 0 \\ 52 \\ \hline \end{array}$ |  | $\begin{array}{r} 27 \\ 1 \end{array}$ | $4_{1}^{6}$ | $\begin{array}{\|l} \hline 58 \\ 13 \\ \hline \end{array}$ | $\begin{aligned} & \hline 36 \\ & 39 \\ & \hline \end{aligned}$ |  | $\begin{array}{r} 28 \\ \hline \end{array}$ | $\begin{array}{r} 53 \\ 0 \end{array}$ | $\begin{array}{\|l\|} \hline \mathbf{1 1} \\ 58 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 23 \\ 19 \\ \hline \end{array}$ |  | $\begin{array}{r} 29 \\ 1 \end{array}$ | $\begin{gathered} 43 \\ 0 \end{gathered}$ | $\begin{array}{\|l} \hline 31 \\ 41 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 21 \\ 53 \\ \hline \end{array}$ | 58 |
| 59 |  | $25$ | $\begin{array}{r} 53 \\ 1 \end{array}$ | $\begin{array}{r} 3 \\ 40 \\ \hline \end{array}$ | $\begin{array}{\|l} 50 \\ 45 \\ \hline \end{array}$ |  | $\begin{array}{r} 27 \\ \hline 1 \end{array}$ | $\begin{array}{r} 27 \\ 1 \end{array}$ | $\begin{array}{\|l} 27 \\ 27 \\ \hline \end{array}$ | $\begin{array}{\|l} \mathbf{5}^{2} \\ 39 \\ \hline \end{array}$ |  | $\begin{array}{r} 28 \\ 1 \end{array}$ | $\begin{array}{r} 48 \\ 1 \end{array}$ | $\begin{array}{\|l} 12 \\ 13 \\ \hline \end{array}$ | $\begin{array}{\|l} 15 \\ 25 \\ \hline \end{array}$ |  | $\begin{array}{r} 29 \\ 1 \end{array}$ | $\begin{gathered} 54 \\ 0 \end{gathered}$ | $\begin{array}{r} 9 \\ 58 \\ \hline \end{array}$ | $\begin{array}{r} 42 \\ 4 \end{array}$ |  | $\begin{array}{r} 30 \\ 1 \end{array}$ | $\begin{gathered} 44 \\ 0 \end{gathered}$ | $\begin{aligned} & 13 \\ & 41 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \mathbf{1 4} \\ 35 \\ \hline \end{array}$ | 59 |
| 60 | 11 | $\begin{array}{r} 26 \\ 1 \end{array}$ | $\left[\begin{array}{c} 54 \\ 1 \end{array}\right.$ | $\begin{aligned} & 44 \\ & 40 \\ & \hline \end{aligned}$ | $\begin{aligned} & 35 \\ & 32 \\ & \hline \end{aligned}$ | 12 | $\begin{array}{r} 28 \\ 1 \end{array}$ | $\begin{array}{r} 28 \\ 1 \end{array}$ | $\begin{array}{\|l\|} \hline 55 \\ 27 \end{array}$ | $\begin{aligned} & \mathbf{3 1} \\ & \mathbf{2 5} \end{aligned}$ | 13 | $\begin{array}{r} 29 \\ 1 \end{array}$ | $\begin{gathered} 49 \\ 1 \end{gathered}$ | $\begin{aligned} & 25 \\ & 13 \end{aligned}$ | $\begin{aligned} & 40 \\ & 10 \end{aligned}$ | 14 | $\underset{1}{30}$ | $\begin{gathered} 55 \\ 0 \end{gathered}$ | $\begin{array}{r} 7 \\ 57 \\ \hline \end{array}$ | $\begin{aligned} & 46 \\ & 48 \\ & \hline \end{aligned}$ | 15 | $\begin{gathered} 3_{1}^{1} \\ \hline \end{gathered}$ | $\begin{gathered} 44 \\ 0 \end{gathered}$ | $\begin{aligned} & 54 \\ & 41 \end{aligned}$ | $\begin{array}{\|l} 49 \\ 19 \\ \hline \end{array}$ | 60 |

Bürgi's 1' sine table (reconstruction, D. Roegel, 2016)

| , | $15^{\circ}$ |  |  |  |  | $16^{\circ}$ |  |  |  |  | $17^{\circ}$ |  |  |  |  | $18^{\circ}$ |  |  |  |  | $19^{\circ}$ |  |  |  |  | 10 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 0 | 15 | $\begin{gathered} 31 \\ 1 \end{gathered}$ | $\begin{array}{r} 44 \\ 0 \end{array}$ | $\begin{array}{\|l\|} \hline 54 \\ 41 \\ \hline \end{array}$ | $\begin{aligned} & 49 \\ & 19 \\ & \hline \end{aligned}$ | 16 | $32$ | $\begin{array}{r} 17 \\ 0 \end{array}$ | $\begin{aligned} & 40 \\ & 23 \end{aligned}$ | $\begin{array}{\|r} \hline 8 \\ 43 \\ \hline \end{array}$ | 17 | $\begin{array}{r} 32 \\ 1 \end{array}$ | $\begin{gathered} 3^{2} \\ 0 \end{gathered}$ | $\begin{array}{r} 17 \\ \hline \end{array}$ | $\begin{array}{r} \hline 18 \\ 1 \\ \hline \end{array}$ | 18 | 32 | $\begin{aligned} & \mathbf{2 7} \\ & 59 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline \mathbf{4 0} \\ 45 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 15 \\ 14 \\ \hline \end{array}$ | 19 | 32 | $\begin{array}{\|r} \hline \mathbf{2} \\ 59 \\ \hline \end{array}$ | $\begin{aligned} & 43 \\ & 24 \\ & \hline \end{aligned}$ | $\begin{aligned} & 17 \\ & 20 \\ & \hline \end{aligned}$ |  |
| 1 |  | $\begin{gathered} 32 \\ 1 \end{gathered}$ | $\begin{gathered} 45 \\ 0 \end{gathered}$ | $\begin{array}{\|l\|} \hline 3^{6} \\ 41 \\ \hline \end{array}$ | $\begin{aligned} & 8 \\ & 2 \end{aligned}$ |  | $33$ | $\begin{gathered} 18 \\ \hline \end{gathered}$ | $\begin{array}{r} 3 \\ 23 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{5 1} \\ & \mathbf{2 5} \end{aligned}$ |  | $\begin{array}{r} 33 \\ 1 \end{array}$ | $\begin{gathered} 32 \\ 0 \end{gathered}$ | $\begin{array}{r} 22 \\ \hline 4 \\ \hline \end{array}$ | $\begin{aligned} & 19 \\ & \hline 4^{2} \\ & \hline \end{aligned}$ |  | 33 | $\begin{aligned} & \mathbf{2 7} \\ & 59 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 25 \\ 44 \\ \hline \end{array}$ | $\begin{aligned} & 29 \\ & 53 \\ & \hline \end{aligned}$ |  | 33 | $\begin{array}{\|r} \hline \mathbf{2} \\ 59 \\ \hline \end{array}$ | 7 <br> 24 | $\begin{array}{r} 37 \\ \hline 0 \end{array}$ |  |
| 2 |  | $\begin{array}{r} 33 \\ 1 \end{array}$ | $\begin{array}{r} 46 \\ 0 \end{array}$ | $\begin{aligned} & 17 \\ & 40 \\ & \hline \end{aligned}$ | $\begin{aligned} & \hline 10 \\ & 45 \\ & \hline \end{aligned}$ |  | $\begin{array}{r} 34 \\ 1 \end{array}$ | $\begin{gathered} 18 \\ 0 \end{gathered}$ | $\begin{aligned} & 27 \\ & 23 \end{aligned}$ | $\begin{array}{r} 16 \\ \hline \end{array}$ |  | $\begin{array}{r} 34 \\ 1 \end{array}$ | $\begin{array}{r} 32 \\ 0 \end{array}$ | $\begin{array}{r} 27 \\ \hline 4 \\ \hline \end{array}$ | $\begin{array}{r} \mathbf{1} \\ \mathbf{2 3} \\ \hline \end{array}$ |  | 34 | $\begin{aligned} & \mathbf{2 7} \\ & 59 \end{aligned}$ | $\begin{array}{\|l\|} \hline 10 \\ 44 \\ \hline \end{array}$ | $\begin{array}{\|l} \mathbf{2 2} \\ 33 \\ \hline \end{array}$ |  | 34 | $\begin{array}{\|r} \mathbf{1} \\ 59 \\ \hline \end{array}$ | $\begin{aligned} & 31 \\ & 23 \end{aligned}$ | $\begin{array}{\|l\|} \hline 37 \\ 37 \end{array}$ |  |
| 3 |  | $\begin{array}{r} 34 \\ 1 \end{array}$ | $\begin{gathered} 46 \\ 0 \end{gathered}$ | $\begin{aligned} & 57 \\ & 40 \\ & \hline \end{aligned}$ | $\begin{aligned} & 55 \\ & 27 \\ & \hline \end{aligned}$ |  | $35$ | $\begin{gathered} 18 \\ 0 \end{gathered}$ | $\begin{array}{\|l} 50 \\ 22 \end{array}$ | $\begin{array}{\|l} 23 \\ 49 \\ \hline \end{array}$ |  | $\begin{array}{r} 35 \\ 1 \end{array}$ | $\begin{gathered} 32 \\ 0 \end{gathered}$ | $\begin{array}{r} \hline 31 \\ \hline 4 \\ \hline \end{array}$ | $\begin{array}{r} 24 \\ 4 \\ \hline \end{array}$ |  | 35 | $\begin{aligned} & \mathbf{2 6} \\ & 59 \end{aligned}$ | $\begin{array}{\|l} \mathbf{5 4} \\ \mathbf{4 4} \\ \hline \end{array}$ | $\begin{array}{\|l} 55 \\ 13 \\ \hline \end{array}$ |  | 35 | $\begin{array}{r} \mathbf{o} \\ 59 \\ \hline \end{array}$ | $\begin{aligned} & 55 \\ & 23 \end{aligned}$ | $\begin{aligned} & 14 \\ & 16 \end{aligned}$ |  |
| 4 |  | $\begin{array}{r} 35 \\ 1 \end{array}$ | $\begin{array}{r} 47 \\ 0 \end{array}$ | $\begin{array}{\|l\|} \hline 38 \\ 40 \\ \hline \end{array}$ | $\begin{aligned} & 22 \\ & 11 \end{aligned}$ |  | $\begin{array}{r} 36 \\ \hline \end{array}$ | $\begin{array}{r} 19 \\ 0 \end{array}$ | $\left\lvert\, \begin{aligned} & 13 \\ & 22 \end{aligned}\right.$ | $\begin{array}{\|l} 12 \\ 30 \\ \hline \end{array}$ |  | $\begin{array}{r} 36 \\ 1 \end{array}$ | $\begin{gathered} 32 \\ 0 \end{gathered}$ | $\begin{array}{r} 35 \\ 3 \end{array}$ | $\begin{aligned} & \hline 28 \\ & 44 \\ & \hline \end{aligned}$ |  | $3^{6}$ | $\begin{aligned} & \mathbf{2 6} \\ & 59 \end{aligned}$ | $\begin{array}{\|l} 39 \\ 43 \end{array}$ | $\begin{array}{r} 8 \\ 52 \\ \hline \end{array}$ |  | $3^{6}$ | $\begin{array}{r} \mathbf{o} \\ 59 \\ \hline \end{array}$ | $\begin{aligned} & 18 \\ & 22 \end{aligned}$ | $\begin{array}{\|l} \hline 30 \\ 55 \\ \hline \end{array}$ |  |
| 5 |  | $\begin{array}{r} 36 \\ 1 \end{array}$ | $\begin{array}{r} 48 \\ 0 \end{array}$ | $\begin{array}{\|l\|} \hline \mathbf{1 8} \\ 39 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 33 \\ 53 \\ \hline \end{array}$ |  | $37$ | $\begin{array}{r} 19 \\ 0 \end{array}$ | $\begin{array}{l\|} \hline 35 \\ 22 \end{array}$ | $\begin{aligned} & \mathbf{4 2}^{2} \\ & 12 \end{aligned}$ |  | $\begin{array}{r} 37 \\ 1 \end{array}$ | $\begin{gathered} 32 \\ 0 \end{gathered}$ | $\begin{array}{r} 39 \\ 3 \\ \hline \end{array}$ | $\begin{aligned} & 12 \\ & 25 \end{aligned}$ |  | 37 | $\begin{aligned} & \mathbf{2 6} \\ & 59 \end{aligned}$ | $\begin{array}{\|l} 23 \\ 43 \\ \hline \end{array}$ | $\begin{array}{r} 0 \\ 32 \\ \hline \end{array}$ |  | $3^{6}$ | $\begin{aligned} & \mathbf{5 9} \\ & 59 \\ & \hline \end{aligned}$ | $\begin{aligned} & \hline \mathbf{4 1} \\ & \mathbf{2 2} \end{aligned}$ | $\begin{aligned} & 25 \\ & 33 \end{aligned}$ |  |
| 6 |  | $\begin{array}{r} 37 \\ 1 \end{array}$ | $\begin{array}{r} 48 \\ 0 \end{array}$ | $\begin{array}{\|l\|} \hline 58 \\ 39 \\ \hline \end{array}$ | $\begin{aligned} & 26 \\ & 36 \end{aligned}$ |  | $\begin{array}{r} 38 \\ 1 \end{array}$ | $\begin{array}{r} 19 \\ 0 \end{array}$ | $\begin{aligned} & 57 \\ & 27 \end{aligned}$ | $\begin{array}{\|} 54 \\ 54 \\ \hline \end{array}$ |  | $\begin{array}{r} 38 \\ 1 \end{array}$ | $\begin{gathered} 3^{2} \\ 0 \end{gathered}$ | $\begin{array}{r} 42 \\ 3 \end{array}$ | $\begin{array}{r} 37 \\ 6 \end{array}$ |  | 38 | $\begin{aligned} & \mathbf{2 6} \\ & 59 \end{aligned}$ | $\begin{array}{r} 6 \\ 43 \\ \hline \end{array}$ | $\left\lvert\, \begin{aligned} & 32 \\ & 11 \end{aligned}\right.$ |  | 37 | $\begin{aligned} & 59 \\ & 59 \\ & \hline \end{aligned}$ | $\begin{array}{r} 3 \\ 22 \end{array}$ | $\begin{aligned} & \hline 58 \\ & 12 \end{aligned}$ | 6 |
| 7 |  | $\begin{gathered} 38 \\ 1 \end{gathered}$ | $\begin{array}{r} 49 \\ 0 \end{array}$ | $\begin{array}{\|l\|} \hline 38 \\ 39 \\ \hline \end{array}$ | $\begin{array}{r} 2 \\ 19 \\ \hline \end{array}$ |  | $39$ | $\begin{gathered} 20 \\ 0 \end{gathered}$ | $\begin{array}{\|l\|} \hline 19 \\ 21 \end{array}$ | $\begin{aligned} & 48 \\ & 36 \end{aligned}$ |  | $\begin{gathered} 39 \\ 1 \end{gathered}$ | $\begin{array}{r} 32 \\ 0 \end{array}$ | $\begin{array}{r} 45 \\ 2 \end{array}$ | $\begin{array}{\|l\|} \hline 43 \\ 46 \end{array}$ |  | 39 | $\begin{array}{\|l} \mathbf{2 5} \\ 59 \end{array}$ | $\begin{array}{\|l} 49 \\ 42 \end{array}$ | $\begin{array}{\|l} 43 \\ 51 \\ \hline \end{array}$ |  | $3^{8}$ | $\begin{aligned} & 58 \\ & 59 \\ & \hline \end{aligned}$ | $\begin{aligned} & \hline 26 \\ & 21 \end{aligned}$ | $\begin{aligned} & 10 \\ & 50 \end{aligned}$ |  |
| 8 |  | $\begin{array}{\|r} 39 \\ 1 \\ \hline \end{array}$ | $\begin{gathered} 50 \\ 0 \end{gathered}$ | $\begin{array}{\|l\|} \hline \mathbf{1 7} \\ 39 \\ \hline \end{array}$ | $\begin{array}{r} 21 \\ \hline 2 \\ \hline \end{array}$ |  | $\begin{gathered} 40 \\ 1 \end{gathered}$ | $\begin{gathered} 20 \\ 0 \end{gathered}$ | $\begin{aligned} & \mathbf{4 1} \\ & 21 \end{aligned}$ | $\begin{array}{\|l\|} \hline 24 \\ 18 \\ \hline \end{array}$ |  | $\begin{gathered} 40 \\ 1 \end{gathered}$ | $\begin{gathered} 32 \\ 0 \end{gathered}$ | $\begin{array}{r} 48 \\ 2 \end{array}$ | $\begin{array}{\|l\|} \hline 29 \\ 27 \\ \hline \end{array}$ |  | 40 | $\begin{aligned} & 25 \\ & 59 \end{aligned}$ | $\begin{array}{\|l} \hline 32 \\ 42 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline \mathbf{3 4} \\ 30 \\ \hline \end{array}$ |  | 39 | $\begin{array}{\|l} 57 \\ 59 \\ \hline \end{array}$ | $\begin{aligned} & 48 \\ & 21 \\ & \hline \end{aligned}$ | $\begin{array}{\|r} \hline \mathbf{0} \\ 29 \\ \hline \end{array}$ | 8 |
| 9 |  | $\begin{gathered} 40 \\ 1 \end{gathered}$ | $\begin{gathered} 50 \\ 0 \end{gathered}$ | $\begin{aligned} & 56 \\ & 38 \end{aligned}$ | $\begin{aligned} & 23 \\ & 45 \end{aligned}$ |  | $\begin{array}{r} 41 \\ 1 \end{array}$ | $\begin{array}{r} 21 \\ 0 \end{array}$ | $\begin{array}{r} 2 \\ 20 \\ \hline \end{array}$ | $\begin{aligned} & 42 \\ & 59 \\ & \hline \end{aligned}$ |  | $\begin{gathered} 41 \\ 1 \end{gathered}$ | $\begin{array}{r} 32 \\ 0 \end{array}$ | $\begin{gathered} 50 \\ 20 \end{gathered}$ | $\begin{array}{r} 56 \\ 7 \end{array}$ |  | 41 | $\begin{aligned} & \mathbf{2 5} \\ & 59 \end{aligned}$ | $\begin{array}{\|l} 15 \\ 4^{2} \\ \hline \end{array}$ | $\begin{array}{r} 4 \\ 10 \end{array}$ |  | 40 | $\begin{array}{\|l} 57 \\ 59 \\ \hline \end{array}$ | $\begin{array}{r} 9 \\ 21 \end{array}$ | $\begin{array}{r} 29 \\ 6 \end{array}$ | 9 |
| 10 | 15 | $\begin{array}{r} 41 \\ 1 \end{array}$ | $\begin{gathered} 51 \\ 0 \end{gathered}$ | $\begin{array}{\|l\|} \hline 35 \\ 38 \\ \hline \end{array}$ | $\begin{array}{r} 8 \\ 27 \\ \hline \end{array}$ | 16 | $\begin{array}{r} 42 \\ 1 \end{array}$ | $\begin{array}{r} 21 \\ 0 \end{array}$ | $\begin{aligned} & 23 \\ & 20 \end{aligned}$ | $\begin{array}{\|l} \hline \mathbf{4 1} \\ \mathbf{4 1} \\ \hline \end{array}$ | 17 | $\begin{array}{r} 42 \\ 1 \end{array}$ | $\begin{gathered} 32 \\ 0 \end{gathered}$ | $53$ | $\begin{array}{r} 3 \\ 48 \\ \hline \end{array}$ | 18 | 42 | $\begin{aligned} & \mathbf{2 4} \\ & 59 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 57 \\ 41 \\ \hline \end{array}$ | $\begin{array}{\|l} 14 \\ 50 \\ \hline \end{array}$ | 19 | 41 | $\begin{aligned} & \mathbf{5 6} \\ & 59 \\ & \hline \end{aligned}$ | $\begin{aligned} & 30 \\ & 20 \end{aligned}$ | $\begin{array}{\|l\|} \hline 35 \\ 46 \\ \hline \end{array}$ |  |
| 11 |  | $\begin{gathered} 42 \\ 1 \\ \hline \end{gathered}$ | $\begin{gathered} 52 \\ 0 \\ \hline \end{gathered}$ | $\begin{array}{\|l} \hline 13 \\ 38 \\ \hline \end{array}$ | $\begin{aligned} & 35 \\ & 10 \\ & \hline \end{aligned}$ |  | $\begin{array}{r} 43 \\ 1 \end{array}$ | $\begin{array}{r} 21 \\ 0 \end{array}$ | $\begin{aligned} & 44 \\ & 20 \end{aligned}$ | $\begin{aligned} & 22 \\ & 22 \\ & \hline \end{aligned}$ |  | $\begin{array}{r} 43 \\ 1 \end{array}$ | $\begin{gathered} 32 \\ 0 \end{gathered}$ | $54$ | $\begin{array}{\|l\|} \hline 51 \\ 29 \\ \hline \end{array}$ |  | 43 | $\begin{aligned} & \mathbf{2 4} \\ & 59 \end{aligned}$ | $\begin{array}{\|l\|} \hline 39 \\ 41 \\ \hline \end{array}$ | $\begin{array}{r} 4 \\ 29 \\ \hline \end{array}$ |  | 42 | $\begin{array}{\|l} \hline 55 \\ 59 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{5 1} \\ & 20 \end{aligned}$ | $\begin{array}{\|l\|} \hline 21 \\ 24 \\ \hline \end{array}$ |  |
| 12 |  | $\begin{gathered} 43 \\ 1 \end{gathered}$ | $\begin{gathered} 5^{2} \\ 0 \end{gathered}$ | $\begin{array}{\|l\|} \hline \mathbf{5 1} \\ 37 \\ \hline \end{array}$ | $\begin{aligned} & 45 \\ & 53 \\ & \hline \end{aligned}$ |  | $\begin{array}{r} 44 \\ 1 \end{array}$ | $\begin{array}{r} 22 \\ 0 \end{array}$ | $\begin{array}{r} 4 \\ 20 \\ \hline \end{array}$ | $\begin{array}{r} 44 \\ \hline \end{array}$ |  | $\begin{array}{r} 44 \\ 1 \end{array}$ | $\begin{gathered} 32 \\ 0 \end{gathered}$ | $\begin{gathered} 56 \\ 1 \end{gathered}$ | $\begin{array}{\|c} 20 \\ 9 \\ \hline \end{array}$ |  | 44 | $\begin{aligned} & \mathbf{2 4} \\ & 59 \\ & \hline \end{aligned}$ | $\begin{aligned} & 20 \\ & 41 \end{aligned}$ | $\begin{array}{r} 33 \\ \hline 8 \end{array}$ |  | 43 | $\begin{aligned} & \hline 55 \\ & 59 \\ & \hline \end{aligned}$ | $\begin{aligned} & 11 \\ & 20 \\ & \hline \end{aligned}$ | $\begin{array}{r} 45 \\ 2 \end{array}$ |  |
| 13 |  | $\begin{array}{r} 44 \\ 1 \end{array}$ | $\begin{array}{r} 53 \\ 0 \end{array}$ | $\begin{array}{\|l\|} \hline 29 \\ 37 \\ \hline \end{array}$ | $\begin{aligned} & 38 \\ & 36 \\ & \hline \end{aligned}$ |  | $45$ | $\begin{array}{r} 22 \\ 0 \end{array}$ | $\begin{array}{\|l} 24 \\ 19 \\ \hline \end{array}$ | $\begin{aligned} & 48 \\ & 46 \end{aligned}$ |  | $\begin{array}{r} 45 \\ 1 \end{array}$ | $\begin{gathered} 32 \\ 0 \end{gathered}$ | $\begin{array}{r} 57 \\ 0 \end{array}$ | $\begin{aligned} & 29 \\ & 50 \\ & \hline \end{aligned}$ |  | 45 | $\begin{aligned} & \mathbf{2 4} \\ & 59 \\ & \hline \end{aligned}$ | $\begin{array}{r} 1 \\ 40 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline \mathbf{4 1} \\ 48 \\ \hline \end{array}$ |  | 44 | $\begin{array}{\|l\|} \hline 54 \\ 59 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{3 1} \\ & 19 \end{aligned}$ | $\begin{array}{\|l} \hline 47 \\ 40 \\ \hline \end{array}$ | 3 |
| 14 |  | $\begin{array}{r} 45 \\ 1 \end{array}$ | $\begin{gathered} 54 \\ 0 \end{gathered}$ | $\begin{array}{r} 7 \\ 37 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 14 \\ 18 \end{array}$ |  | $\begin{array}{r} 46 \\ 1 \end{array}$ | $\begin{array}{r} 22 \\ 0 \end{array}$ | $\begin{aligned} & 44 \\ & 19 \\ & \hline \end{aligned}$ | $\begin{aligned} & 34 \\ & 27 \\ & \hline \end{aligned}$ |  | $\begin{array}{r} 46 \\ 1 \end{array}$ | $\begin{gathered} 3^{2} \\ 0 \end{gathered}$ | $\begin{gathered} 58 \\ 0 \end{gathered}$ | $\begin{aligned} & 19 \\ & 30 \end{aligned}$ |  | 46 | $\begin{aligned} & 23 \\ & 59 \\ & \hline \end{aligned}$ | $\begin{aligned} & 42 \\ & 40 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 29 \\ 27 \\ \hline \end{array}$ |  | 45 | $\begin{array}{\|l\|} \hline 53 \\ 59 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{5 1} \\ & 19 \end{aligned}$ | $\begin{array}{\|l} 27 \\ 19 \\ \hline \end{array}$ |  |
| 15 |  | $\begin{gathered} 46 \\ 1 \end{gathered}$ | $\begin{gathered} 54 \\ 0 \end{gathered}$ | $\begin{array}{\|l\|} \hline 44 \\ 37 \\ \hline \end{array}$ | $\begin{array}{r} 32 \\ 1 \end{array}$ |  | $\begin{array}{r} 47 \\ 1 \end{array}$ | $\begin{array}{r} 23 \\ 0 \end{array}$ | $\begin{array}{r} 4 \\ 19 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{1} \\ & \mathbf{9} \\ & \hline \end{aligned}$ |  | $\begin{array}{r} 47 \\ 1 \end{array}$ | $\begin{gathered} 32 \\ 0 \end{gathered}$ | $\begin{array}{r} 58 \\ 0 \end{array}$ | $\begin{aligned} & 49 \\ & 10 \\ & \hline \end{aligned}$ |  | 47 | $\begin{aligned} & \mathbf{2 3} \\ & 59 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 22 \\ 40 \\ \hline \end{array}$ | $\begin{array}{r} 56 \\ \hline \end{array}$ |  | 46 | $\begin{array}{\|l} 53 \\ 59 \\ \hline \end{array}$ | $\begin{aligned} & 10 \\ & 18 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 46 \\ 57 \\ \hline \end{array}$ |  |
| 16 |  | $\begin{array}{r} 47 \\ 1 \end{array}$ | $\begin{array}{r} 55 \\ 0 \end{array}$ | $\begin{aligned} & 21 \\ & 36 \end{aligned}$ | $\begin{array}{\|l\|} \hline 33 \\ 44 \\ \hline \end{array}$ |  | $\begin{array}{r} 48 \\ 1 \end{array}$ | $\begin{gathered} 23 \\ 0 \end{gathered}$ | $\begin{array}{\|l} 23 \\ 18 \end{array}$ | $\begin{aligned} & 10 \\ & 51 \\ & \hline \end{aligned}$ |  | 48 | $\begin{aligned} & \mathbf{3 2} \\ & 59 \end{aligned}$ | $\begin{aligned} & 58 \\ & 59 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 59 \\ 51 \\ \hline \end{array}$ |  | 48 | $\begin{aligned} & \mathbf{2 3} \\ & 59 \\ & \hline \end{aligned}$ | $\begin{array}{r} 3 \\ 39 \\ \hline \end{array}$ | $\begin{array}{r} 2 \\ 4^{6} \\ \hline \end{array}$ |  | 47 | $\begin{aligned} & \mathbf{5 2} \\ & 59 \end{aligned}$ | $\begin{aligned} & 29 \\ & 18 \end{aligned}$ | $\begin{array}{\|l} 43 \\ 35 \\ \hline \end{array}$ |  |
| 17 |  | $48$ | $\begin{array}{r} 55 \\ 0 \\ \hline \end{array}$ | $\begin{aligned} & 58 \\ & 36 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline \mathbf{1 7} \\ \mathbf{2 7} \end{array}$ |  | $\begin{array}{r} 49 \\ 1 \\ \hline \end{array}$ | $\begin{array}{r} 23 \\ 0 \\ \hline \end{array}$ | $\begin{aligned} & 42 \\ & 18 \\ & \hline \end{aligned}$ | $\begin{array}{\|r} 1 \\ 3^{2} \\ \hline \end{array}$ |  | 49 | $\begin{aligned} & 3^{2} \\ & 59 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 58 \\ 59 \\ \hline \end{array}$ | $\begin{aligned} & 50 \\ & 32 \\ & \hline \end{aligned}$ |  | 49 | $\begin{aligned} & \mathbf{2 2} \\ & 59 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline \mathbf{4 2} \\ 39 \\ \hline \end{array}$ | $\begin{aligned} & 48 \\ & 26 \end{aligned}$ |  | 48 | $\begin{array}{\|l\|} \hline \mathbf{5 1} \\ 59 \\ \hline \end{array}$ | $\begin{aligned} & 48 \\ & 18 \end{aligned}$ | $\begin{array}{\|l} \hline 18 \\ 14 \\ \hline \end{array}$ | 7 |
| 18 |  | $\left[\begin{array}{c} 49 \\ 1 \end{array}\right.$ | $\begin{gathered} 56 \\ 0 \end{gathered}$ | $\begin{array}{\|l} 34 \\ 36 \\ \hline \end{array}$ | $\begin{array}{r} 44 \\ 9 \\ \hline \end{array}$ |  | $\begin{array}{r} 50 \\ 1 \end{array}$ | $\begin{gathered} 24 \\ 0 \end{gathered}$ | $\begin{array}{r} \mathbf{o} \\ 18 \end{array}$ | $\begin{array}{\|l} 33 \\ 13 \end{array}$ |  | 50 | $\begin{aligned} & \mathbf{3 2}^{2} \\ & 59 \end{aligned}$ | $\begin{array}{\|l\|} \hline 58 \\ 59 \\ \hline \end{array}$ | $\begin{aligned} & 22 \\ & 12 \end{aligned}$ |  | 50 | $\begin{array}{\|l} \mathbf{2 2} \\ 59 \\ \hline \end{array}$ | $\begin{array}{\|l} \mathbf{2 2} \\ 39 \\ \hline \end{array}$ | $\begin{array}{r} 14 \\ 4 \end{array}$ |  | 49 | $\begin{array}{\|l\|l} \mathbf{5 1} \\ \mathbf{5 9} \\ \hline \end{array}$ | $\begin{array}{r} 6 \\ 17 \\ \hline \end{array}$ | $\begin{aligned} & 32 \\ & 5^{2} \end{aligned}$ |  |
| 19 |  | $\begin{gathered} 50 \\ 1 \end{gathered}$ | $\begin{array}{r} 57 \\ 0 \end{array}$ | $\begin{aligned} & \hline 10 \\ & 35 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 53 \\ 51 \\ \hline \end{array}$ |  | 51 1 | $\begin{array}{r} 24 \\ 0 \end{array}$ | $\begin{aligned} & \hline 18 \\ & 17 \\ & \hline \end{aligned}$ | $\begin{aligned} & 46 \\ & 56 \end{aligned}$ |  | 51 | $\begin{aligned} & \mathbf{3 2} \\ & 59 \end{aligned}$ | $\begin{array}{\|l\|} \hline 57 \\ 58 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 34 \\ 53 \\ \hline \end{array}$ |  | 51 | $\begin{aligned} & \mathbf{2 2} \\ & 59 \\ & \hline \end{aligned}$ | $\begin{array}{\|r} \hline \mathbf{1} \\ 3^{8} \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline \mathbf{1 8} \\ 44 \\ \hline \end{array}$ |  | 50 | $\begin{array}{\|l\|} \hline 50 \\ 59 \\ \hline \end{array}$ | $\begin{aligned} & 24 \\ & 17 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 24 \\ 30 \\ \hline \end{array}$ |  |
| 20 | 15 | $\begin{gathered} 51 \\ 1 \end{gathered}$ | $\begin{array}{r} 57 \\ 0 \end{array}$ | $\begin{aligned} & 46 \\ & 35 \end{aligned}$ | $\begin{aligned} & 44 \\ & 35 \end{aligned}$ | 16 | $\begin{array}{r} 52 \\ 1 \end{array}$ | $\begin{gathered} 24 \\ 0 \end{gathered}$ | $\begin{aligned} & 36 \\ & 17 \\ & \hline \end{aligned}$ | $\begin{aligned} & 42 \\ & 3^{6} \end{aligned}$ | 17 | 52 | $\begin{aligned} & \mathbf{3 2} \\ & 59 \end{aligned}$ | $\begin{aligned} & 56 \\ & 58 \end{aligned}$ | $\begin{aligned} & 27 \\ & 32 \end{aligned}$ | 18 | 52 | $\begin{aligned} & \mathbf{2 1} \\ & 59 \end{aligned}$ | $\begin{aligned} & 40 \\ & 38 \end{aligned}$ | $\begin{array}{r} 2 \\ 24 \\ \hline \end{array}$ | 19 | 51 | $\begin{aligned} & 49 \\ & 59 \\ & \hline \end{aligned}$ | $\begin{aligned} & \mathbf{4 1} \\ & \mathbf{1} \end{aligned}$ | $\begin{array}{\|r} 54 \\ \hline \end{array}$ |  |
| 21 |  | $\begin{gathered} 52 \\ 1 \end{gathered}$ | $\begin{gathered} 58 \\ 0 \end{gathered}$ | $\begin{aligned} & 22 \\ & 35 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 19 \\ 17 \\ \hline \end{array}$ |  | $53$ | $\begin{gathered} 24 \\ 0 \end{gathered}$ | $\begin{aligned} & 54 \\ & 17 \\ & \hline \end{aligned}$ | $\begin{aligned} & 18 \\ & 18 \\ & \hline \end{aligned}$ |  | 53 | $\begin{aligned} & 32 \\ & 59 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline \mathbf{5 4} \\ 58 \\ \hline \end{array}$ | $\begin{array}{\|l} 59 \\ 14 \\ \hline \end{array}$ |  | 53 | $\begin{array}{\|l\|} \mathbf{2 1} \\ 59 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 18 \\ 38 \\ \hline \end{array}$ | $\begin{array}{r} 26 \\ 2 \end{array}$ |  | 52 | $\begin{aligned} & 48 \\ & 59 \\ & \hline \end{aligned}$ | $\begin{aligned} & 59 \\ & 16 \end{aligned}$ | $\begin{array}{\|r} \hline \mathbf{2} \\ 47 \\ \hline \end{array}$ |  |
| 22 |  | $\left[\begin{array}{r} 53 \\ 1 \end{array}\right.$ | $\begin{gathered} 58 \\ 0 \end{gathered}$ | $\begin{array}{\|l\|} \hline 57 \\ 34 \end{array}$ | $\begin{aligned} & \mathbf{3 6} \\ & 59 \\ & \hline \end{aligned}$ |  | $\underset{1}{54}$ | $\begin{gathered} 25 \\ 0 \end{gathered}$ | $\begin{array}{\|l\|} \mathbf{1 1} \\ \mathbf{1 7} \end{array}$ | $\begin{gathered} 36 \\ 0 \end{gathered}$ |  | 54 | $\begin{aligned} & \mathbf{3 2} \\ & 59 \end{aligned}$ | $\begin{array}{\|l\|} \hline 53 \\ 57 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline \mathbf{1 3} \\ 53 \end{array}$ |  | 54 | $\begin{array}{\|l} \mathbf{2 0} \\ 59 \end{array}$ | $\begin{aligned} & 56 \\ & 37 \\ & \hline \end{aligned}$ | $\begin{aligned} & 28 \\ & 42 \end{aligned}$ |  | 53 | $\begin{aligned} & 48 \\ & 59 \end{aligned}$ | $\begin{aligned} & 15 \\ & 16 \end{aligned}$ | $\begin{array}{\|l} \hline 49 \\ 24 \\ \hline \end{array}$ |  |
| 23 |  | $\begin{array}{\|c\|} \hline 54 \\ 1 \\ \hline \end{array}$ | $\begin{array}{r} 59 \\ 0 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline \mathbf{3 2}^{2} \\ 34 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 35 \\ 4^{2} \\ \hline \end{array}$ |  | $\begin{array}{r} 55 \\ 1 \\ \hline \end{array}$ | $\begin{gathered} 25 \\ 0 \end{gathered}$ | $\begin{aligned} & 28 \\ & 16 \\ & \hline \end{aligned}$ | $\begin{aligned} & 36 \\ & 4^{1} \\ & \hline \end{aligned}$ |  | 55 | $\begin{aligned} & \mathbf{3 2}^{2} \\ & 59 \\ & \hline \end{aligned}$ | $\begin{aligned} & \mathbf{5 1} \\ & 57 \\ & \hline \end{aligned}$ | $\begin{array}{\|r} \hline 6 \\ 34 \\ \hline \end{array}$ |  | 55 | $\begin{aligned} & 20 \\ & 59 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline \mathbf{3 4} \\ 37 \\ \hline \end{array}$ | $\begin{aligned} & \hline 10 \\ & 21 \\ & \hline \end{aligned}$ |  | 54 | $\begin{array}{\|l} \hline 47 \\ 59 \\ \hline \end{array}$ | $\begin{aligned} & 32 \\ & 16 \end{aligned}$ | $\begin{array}{\|r} \hline 13 \\ 3 \\ \hline \end{array}$ |  |
| 24 |  | $\begin{gathered} 56 \\ 1 \end{gathered}$ | $\begin{aligned} & 0 \\ & 0 \end{aligned}$ | $\begin{array}{\|r} 7 \\ 34 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{1 7} \\ & \mathbf{2 4} \end{aligned}$ |  | $\begin{array}{r} 56 \\ 1 \end{array}$ | $\begin{gathered} 25 \\ 0 \end{gathered}$ | $\begin{aligned} & 45 \\ & 16 \end{aligned}$ | $\left\lvert\, \begin{aligned} & 17 \\ & 22 \end{aligned}\right.$ |  | 56 | $\begin{aligned} & \mathbf{3 2}^{2} \\ & 59 \end{aligned}$ | $\begin{aligned} & 48 \\ & 57 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 40 \\ 14 \end{array}$ |  | 56 | $\begin{array}{\|l} \mathbf{2 0} \\ 59 \end{array}$ | $\begin{array}{\|l\|} \mathbf{1 1} \\ 37 \\ \hline \end{array}$ | $\left\lvert\, \begin{array}{r} 31 \\ 0 \end{array}\right.$ |  | 55 | $\begin{aligned} & 46 \\ & 59 \end{aligned}$ | $\begin{aligned} & 48 \\ & 15 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 16 \\ 41 \\ \hline \end{array}$ |  |
| 25 |  | $\begin{array}{r} 57 \\ 1 \end{array}$ | $\begin{aligned} & \mathbf{0} \\ & \mathbf{0} \end{aligned}$ | $\begin{aligned} & \hline \mathbf{4 1} \\ & 34 \\ & \hline \end{aligned}$ | $\begin{array}{\|r} \hline \mathbf{4 1} \\ 7 \\ \hline \end{array}$ |  | $\begin{array}{r} 57 \\ 1 \end{array}$ | $\begin{gathered} 26 \\ 0 \\ \hline \end{gathered}$ | $\begin{array}{r} 1 \\ 16 \\ \hline \end{array}$ | $\begin{array}{r} 39 \\ \hline \end{array}$ |  | 57 | $\begin{aligned} & \mathbf{3 2} \\ & 59 \end{aligned}$ | $\begin{aligned} & 45 \\ & 56 \end{aligned}$ | $\begin{aligned} & \mathbf{5 4} \\ & 55 \\ & \hline \end{aligned}$ |  | 57 | $\begin{array}{r} 19 \\ 59 \\ \hline \end{array}$ | $\begin{aligned} & 48 \\ & 36 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 31 \\ 40 \\ \hline \end{array}$ |  | 56 | $\begin{array}{\|l} \hline 46 \\ 59 \\ \hline \end{array}$ | $\begin{array}{r} \hline 3 \\ 15 \\ \hline \end{array}$ | $\begin{array}{\|l} 57 \\ 19 \\ \hline \end{array}$ |  |
| 26 |  | $\begin{gathered} 58 \\ 1 \end{gathered}$ | $\begin{aligned} & 1 \\ & 0 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 15 \\ 33 \\ \hline \end{array}$ | $\begin{aligned} & 48 \\ & 50 \\ & \hline \end{aligned}$ |  | $\begin{array}{r} 58 \\ 1 \end{array}$ | $\begin{gathered} 26 \\ 0 \end{gathered}$ | $\begin{array}{\|l} \mathbf{1 7} \\ 15 \\ \hline \end{array}$ | $\begin{aligned} & 43 \\ & 45 \\ & \hline \end{aligned}$ |  | 58 | $\begin{aligned} & \mathbf{3 2} \\ & 59 \end{aligned}$ | $\begin{aligned} & 42 \\ & 56 \end{aligned}$ | $\begin{aligned} & 49 \\ & 35 \end{aligned}$ |  | 58 | $\begin{aligned} & 19 \\ & 59 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 25 \\ 36 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 11 \\ \mathbf{1 9} \\ \hline \end{array}$ |  | 57 | $\begin{aligned} & 45 \\ & 59 \\ & \hline \end{aligned}$ | $\begin{aligned} & 19 \\ & 14 \end{aligned}$ | $\begin{array}{\|l} \hline 16 \\ 58 \\ \hline \end{array}$ |  |
| 27 |  | $\begin{array}{r} 59 \\ 1 \end{array}$ | $0$ | $\begin{aligned} & 49 \\ & 33 \\ & \hline \end{aligned}$ | $\begin{aligned} & \hline 38 \\ & 32 \\ & \hline \end{aligned}$ |  | $59$ | $\begin{gathered} 26 \\ \hline 0 \end{gathered}$ | $\begin{aligned} & 33 \\ & 15 \\ & \hline \end{aligned}$ | $\begin{aligned} & 28 \\ & 27 \\ & \hline \end{aligned}$ |  | 59 | $\begin{aligned} & 3^{2} \\ & 59 \\ & \hline \end{aligned}$ | $\begin{aligned} & 39 \\ & 56 \end{aligned}$ | $\begin{array}{\|l} 24 \\ 15 \\ \hline \end{array}$ |  | 59 | $\begin{aligned} & 19 \\ & 59 \\ & \hline \end{aligned}$ | $\begin{array}{\|r} \mathbf{1} \\ 35 \\ \hline \end{array}$ | $\begin{aligned} & 30 \\ & 58 \\ & \hline \end{aligned}$ |  | 58 | $\begin{array}{\|l\|} \hline 44 \\ 59 \\ \hline \end{array}$ | $\begin{aligned} & 34 \\ & 14 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \mathbf{1 4} \\ 35 \\ \hline \end{array}$ |  |
| 28 | 16 | $\begin{aligned} & \mathbf{0} \\ & 1 \end{aligned}$ | $\begin{aligned} & 2 \\ & 0 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 23 \\ 33 \\ \hline \end{array}$ | $\begin{aligned} & 10 \\ & 14 \\ & \hline \end{aligned}$ | 17 | $\mathbf{0}$ | $\begin{gathered} 26 \\ 0 \end{gathered}$ | $\begin{aligned} & 48 \\ & 15 \end{aligned}$ | $\begin{array}{r} 55 \\ 8 \end{array}$ | 18 | 0 | $\begin{aligned} & 32 \\ & 59 \end{aligned}$ | $\begin{aligned} & 35 \\ & 55 \\ & \hline \end{aligned}$ | $\begin{aligned} & 39 \\ & 55 \\ & \hline \end{aligned}$ | 19 | 0 | $\begin{aligned} & \mathbf{1 8} \\ & 59 \end{aligned}$ | $\begin{array}{\|l} 37 \\ 35 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{2 8} \\ & 37 \end{aligned}$ |  | 59 | $\begin{aligned} & 43 \\ & 59 \\ & \hline \end{aligned}$ | $\begin{aligned} & 48 \\ & 14 \end{aligned}$ | $\begin{aligned} & 49 \\ & 13 \end{aligned}$ |  |
| 29 |  | $\begin{aligned} & \mathbf{1} \\ & \mathbf{1} \end{aligned}$ | $\begin{aligned} & \mathbf{2} \\ & \mathbf{0} \\ & \hline \end{aligned}$ | $\begin{aligned} & 56 \\ & 32 \end{aligned}$ | $\begin{array}{\|c} \mathbf{2 4} \\ 57 \\ \hline \end{array}$ |  | $1$ | $\begin{array}{r} 27 \\ 0 \end{array}$ | $\begin{array}{r} 4 \\ 14 \\ \hline \end{array}$ | $\begin{array}{r} 3 \\ 49 \\ \hline \end{array}$ |  | 1 | $\begin{aligned} & \mathbf{3 2}^{2} \\ & 59 \\ & \hline \end{aligned}$ | $\begin{aligned} & \mathbf{3}^{1} \\ & 55 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 34 \\ 36 \\ \hline \end{array}$ |  | 1 | $\begin{aligned} & \mathbf{1 8} \\ & 59 \end{aligned}$ | $\begin{array}{\|l} \mathbf{1 3} \\ 35 \\ \hline \end{array}$ | $\begin{array}{r} 5 \\ 16 \\ \hline \end{array}$ | 20 | 0 | $\begin{aligned} & 43 \\ & 59 \\ & \hline \end{aligned}$ | $\begin{array}{\|r} 3 \\ 13 \\ \hline \end{array}$ | 2 |  |
| 30 | 16 | $\begin{aligned} & 2 \\ & 1 \end{aligned}$ | $\begin{aligned} & 3 \\ & 0 \\ & \hline \end{aligned}$ | $\begin{aligned} & 29 \\ & 32 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 21 \\ 40 \\ \hline \end{array}$ | 17 | 2 | $\begin{array}{r} 27 \\ 0 \end{array}$ | $\begin{aligned} & \hline 18 \\ & 14 \\ & \hline \end{aligned}$ | $\begin{aligned} & 52 \\ & 3^{1} \\ & \hline \end{aligned}$ | 18 | 2 | $\begin{aligned} & 3^{2} \\ & 59 \\ & \hline \end{aligned}$ | $\begin{aligned} & \mathbf{2 7} \\ & 55 \\ & \hline \end{aligned}$ | $\begin{aligned} & 10 \\ & 15 \\ & \hline \end{aligned}$ | 19 | 2 | $\begin{array}{\|l} \mathbf{1 7} \\ 59 \\ \hline \end{array}$ | $\begin{aligned} & 48 \\ & 34 \\ & \hline \end{aligned}$ | $\begin{aligned} & \mathbf{2 1} \\ & 55 \\ & \hline \end{aligned}$ | 20 | 1 | $\begin{aligned} & 42 \\ & 59 \\ & \hline \end{aligned}$ | $\begin{aligned} & 16 \\ & 13 \end{aligned}$ | $\begin{array}{\|l\|} \hline 54 \\ 29 \\ \hline \end{array}$ |  |

Bürgi's 1' sine table (reconstruction, D. Roegel, 2016)

| 1 | $15^{\circ}$ |  |  |  |  | $16^{\circ}$ |  |  |  |  | $17^{\circ}$ |  |  |  |  | $18^{\circ}$ |  |  |  |  | $19^{\circ}$ |  |  |  |  | , |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 30 | 16 | $2$ | $\begin{aligned} & 3 \\ & 0 \\ & \hline \end{aligned}$ | $\begin{aligned} & 29 \\ & 32 \\ & \hline \end{aligned}$ | $\begin{aligned} & 21 \\ & 40 \end{aligned}$ | 17 | $2$ | $\begin{array}{r} 27 \\ 0 \end{array}$ | $\begin{array}{\|l\|} \hline 18 \\ 14 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{5 2}^{2} \\ & 31 \\ & \hline \end{aligned}$ | 18 | 2 | $\begin{aligned} & \mathbf{3 2} \\ & 59 \end{aligned}$ | $\begin{aligned} & \hline 27 \\ & 55 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 10 \\ 15 \\ \hline \end{array}$ | 19 | 2 | $\begin{array}{\|l\|} \hline \mathbf{1 7} \\ 59 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 48 \\ 34 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline \mathbf{2 1} \\ 55 \\ \hline \end{array}$ | 20 | 1 | $\begin{array}{\|l\|} \hline \mathbf{4 2}^{2} \\ 59 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 16 \\ 13 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 54 \\ 29 \\ \hline \end{array}$ | 30 |
| 31 |  | $3$ | $\begin{aligned} & 4 \\ & 0 \end{aligned}$ | $\begin{array}{r} 2 \\ 3^{2} \\ \hline \end{array}$ | $\begin{array}{\|r} 1 \\ 21 \end{array}$ |  | $3$ | $\begin{array}{r} 27 \\ 0 \end{array}$ | $\begin{array}{\|l\|} \hline 33 \\ 14 \\ \hline \end{array}$ | $\begin{array}{\|l} 23 \\ 11 \end{array}$ |  | 3 | $\begin{aligned} & 32 \\ & 59 \end{aligned}$ | $\begin{aligned} & \mathbf{2 2} \\ & 54 \\ & \hline \end{aligned}$ | $\begin{aligned} & 25 \\ & 56 \\ & \hline \end{aligned}$ |  | 3 | $\begin{array}{\|l} \mathbf{1 7} \\ 59 \\ \hline \end{array}$ | $\begin{array}{\|l} \mathbf{2 3} \\ 34 \\ \hline \end{array}$ | $\begin{aligned} & 16 \\ & 35 \\ & \hline \end{aligned}$ |  | 2 | $\begin{aligned} & \hline \mathbf{4 1} \\ & 59 \\ & \hline \end{aligned}$ | $\begin{aligned} & \hline 30 \\ & 13 \\ & \hline \end{aligned}$ | $\begin{array}{r} 23 \\ 8 \end{array}$ | 31 |
| 32 |  | $\begin{aligned} & 4 \\ & 1 \end{aligned}$ | $\begin{aligned} & 4 \\ & 0 \\ & \hline \end{aligned}$ | $\begin{aligned} & 34 \\ & 3^{2} \\ & \hline \end{aligned}$ | $\begin{array}{r} 22 \\ \hline 4 \\ \hline \end{array}$ |  | $\begin{aligned} & 4 \\ & 1 \end{aligned}$ | $\begin{array}{r} 27 \\ 0 \end{array}$ | $\begin{array}{\|l\|} \hline 47 \\ 13 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 34 \\ 54 \\ \hline \end{array}$ |  | 4 | $\begin{aligned} & \mathbf{3 2} \\ & 59 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 17 \\ 54 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 21 \\ 37 \\ \hline \end{array}$ |  | 4 | $\begin{array}{\|l} \hline \mathbf{1 6} \\ 59 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 57 \\ 34 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 51 \\ 13 \\ \hline \end{array}$ |  | 3 | $\begin{aligned} & \hline 40 \\ & 59 \\ & \hline \end{aligned}$ | $\begin{aligned} & \hline 43 \\ & 12 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline \mathbf{3 1} \\ 45 \\ \hline \end{array}$ | 32 |
| 33 |  | $\begin{aligned} & 5 \\ & 7 \end{aligned}$ | $\begin{aligned} & 5 \\ & 0 \end{aligned}$ | $\begin{array}{r} 6 \\ 3^{1} \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{2 6} \\ & 47 \\ & \hline \end{aligned}$ |  | $\begin{aligned} & 5 \\ & 1 \end{aligned}$ | $\begin{gathered} 28 \\ 0 \end{gathered}$ | $\begin{array}{\|r} \mathbf{1} \\ \mathbf{1 3} \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{2 8} \\ & 34 \\ & \hline \end{aligned}$ |  | 5 | $\begin{aligned} & 32 \\ & 59 \end{aligned}$ | $\begin{array}{\|l\|} \hline \mathbf{1 1} \\ 54 \\ \hline \end{array}$ | $\begin{aligned} & 58 \\ & 16 \end{aligned}$ |  | 5 | $\begin{array}{\|l} \hline 16 \\ 59 \\ \hline \end{array}$ | $\begin{array}{\|l} \mathbf{3 2} \\ 33 \\ \hline \end{array}$ | $\begin{array}{\|r} 4 \\ 53 \\ \hline \end{array}$ |  | 4 | $\begin{array}{\|l\|} \hline 39 \\ 59 \\ \hline \end{array}$ | $\begin{aligned} & 56 \\ & 12 \end{aligned}$ | $\begin{array}{\|l\|} \hline 16 \\ 24 \\ \hline \end{array}$ | 33 |
| 34 |  | $\begin{aligned} & 6 \\ & 1 \end{aligned}$ | $\begin{aligned} & 5 \\ & 0 \end{aligned}$ | $\begin{aligned} & 3^{8} \\ & 3^{1} \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 13 \\ 28 \end{array}$ |  | $\begin{aligned} & 6 \\ & 1 \\ & \hline \end{aligned}$ | $\begin{gathered} 28 \\ 0 \end{gathered}$ | $\begin{array}{\|l\|} 15 \\ 13 \\ \hline \end{array}$ | $\begin{array}{r} 2 \\ 16 \end{array}$ |  | 6 | $\begin{aligned} & 32 \\ & 59 \end{aligned}$ | $\begin{array}{r} 6 \\ 53 \\ \hline \end{array}$ | $\begin{array}{\|l} 14 \\ 56 \\ \hline \end{array}$ |  | 6 | $\begin{array}{\|l} \hline 16 \\ 59 \\ \hline \end{array}$ | $\begin{array}{r} 5 \\ 33 \\ \hline \end{array}$ | $\begin{array}{\|l} 57 \\ 31 \\ \hline \end{array}$ |  | 5 | $\begin{array}{\|l\|} \hline 39 \\ 59 \\ \hline \end{array}$ | $\begin{array}{r} 8 \\ 12 \end{array}$ | $\begin{array}{r} 40 \\ 1 \end{array}$ | 34 |
| 35 |  | $\begin{aligned} & 7 \\ & 1 \end{aligned}$ | $\begin{aligned} & 6 \\ & 0 \end{aligned}$ | $\begin{array}{r} 9 \\ 3^{1} \end{array}$ | $\begin{array}{\|l} 41 \\ 12 \end{array}$ |  | $\begin{aligned} & 7 \\ & 1 \end{aligned}$ | $\begin{gathered} 28 \\ 0 \end{gathered}$ | $\begin{aligned} & 28 \\ & 12 \end{aligned}$ | $\begin{aligned} & 18 \\ & 56 \end{aligned}$ |  | 7 | $\begin{aligned} & \mathbf{3 2}^{2} \\ & 59 \end{aligned}$ | $\begin{array}{\|r} \mathbf{0} \\ 53 \\ \hline \end{array}$ | $\begin{array}{\|l} \mathbf{1 0} \\ 37 \\ \hline \end{array}$ |  | 7 | $\begin{aligned} & \mathbf{1 5} \\ & 59 \end{aligned}$ | $\left\lvert\, \begin{aligned} & 39 \\ & 33 \end{aligned}\right.$ | $\begin{aligned} & \hline 28 \\ & 11 \end{aligned}$ |  | 6 | $\begin{array}{\|l\|} \hline 38 \\ 59 \\ \hline \end{array}$ | $\begin{aligned} & 20 \\ & 11 \end{aligned}$ | $\begin{aligned} & \hline \mathbf{4 1} \\ & 40 \end{aligned}$ | 35 |
| 36 |  | $\begin{aligned} & 8 \\ & 1 \end{aligned}$ | $\begin{aligned} & 6 \\ & 0 \end{aligned}$ | $\begin{aligned} & 40 \\ & 30 \end{aligned}$ | $\begin{array}{\|l} 53 \\ 53 \end{array}$ |  | $8$ | $\begin{gathered} 28 \\ 0 \end{gathered}$ | $\begin{aligned} & \hline 41 \\ & 12 \end{aligned}$ | $\begin{array}{\|l\|} \hline 14 \\ 39 \\ \hline \end{array}$ |  | 8 | $\begin{aligned} & \mathbf{3 1} \\ & 59 \end{aligned}$ | $\begin{aligned} & 53 \\ & 53 \end{aligned}$ | $\begin{array}{\|l} 47 \\ 17 \end{array}$ |  | 8 | $\begin{array}{\|l} \hline 15 \\ 59 \\ \hline \end{array}$ | $\begin{array}{\|l} 12 \\ 32 \\ \hline \end{array}$ | $\begin{aligned} & 39 \\ & 50 \end{aligned}$ |  | 7 | $\begin{aligned} & 37 \\ & 59 \end{aligned}$ | $\begin{aligned} & 32 \\ & 11 \end{aligned}$ | $\begin{aligned} & 21 \\ & 17 \end{aligned}$ | 36 |
| 37 |  | $\begin{aligned} & 9 \\ & 1 \end{aligned}$ | $\begin{aligned} & 7 \\ & 0 \end{aligned}$ | $\begin{aligned} & 11 \\ & 30 \end{aligned}$ | $\begin{aligned} & 46 \\ & 36 \end{aligned}$ |  | $9$ | $\begin{gathered} 28 \\ 0 \end{gathered}$ | $\begin{aligned} & 53 \\ & 12 \end{aligned}$ | $\begin{aligned} & 53 \\ & 19 \end{aligned}$ |  | 9 | $\begin{aligned} & \mathbf{3 1} \\ & 59 \end{aligned}$ | $\begin{aligned} & 47 \\ & 52 \\ & \hline \end{aligned}$ | $\begin{array}{r} 4 \\ 57 \\ \hline \end{array}$ |  | 9 | $\begin{array}{\|l} \mathbf{1 4} \\ 59 \\ \hline \end{array}$ | $\begin{aligned} & 45 \\ & 32 \\ & \hline \end{aligned}$ | $\begin{aligned} & 29 \\ & 28 \end{aligned}$ |  | 8 | $\begin{array}{\|l\|} \hline 36 \\ 59 \\ \hline \end{array}$ | $\begin{aligned} & 43 \\ & 10 \end{aligned}$ | $\begin{array}{\|l} \hline 38 \\ 55 \\ \hline \end{array}$ | 37 |
| $3^{8}$ |  | $\begin{array}{\|r} 10 \\ 1 \\ \hline \end{array}$ | $\begin{aligned} & 7 \\ & 0 \end{aligned}$ | $\begin{aligned} & 4^{2} \\ & 30 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 22 \\ 18 \end{array}$ |  | $\begin{array}{r} 10 \\ 1 \end{array}$ | $\begin{array}{r} 29 \\ 0 \end{array}$ | $\begin{array}{r} 6 \\ 12 \\ \hline \end{array}$ | $\begin{gathered} 12 \\ 0 \end{gathered}$ |  | 10 | $\begin{aligned} & \mathbf{3 1} \\ & 59 \\ & \hline \end{aligned}$ | $\begin{aligned} & 40 \\ & 52 \\ & \hline \end{aligned}$ | $\begin{array}{\|r} \hline \mathbf{1} \\ 3^{6} \\ \hline \end{array}$ |  | 10 | $\begin{array}{\|l\|} \hline \mathbf{1 4} \\ 59 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 17 \\ 32 \\ \hline \end{array}$ | $\begin{array}{r} 57 \\ 8 \end{array}$ |  | 9 | $\begin{array}{\|l\|} \hline 35 \\ 59 \\ \hline \end{array}$ | $\begin{aligned} & 54 \\ & 10 \end{aligned}$ | $\begin{array}{\|l} \hline 33 \\ 33 \\ \hline \end{array}$ | $3^{8}$ |
| 39 |  | $\begin{array}{\|r\|} \hline 11 \\ 1 \end{array}$ | $\begin{aligned} & 8 \\ & 0 \end{aligned}$ | $\begin{aligned} & 12 \\ & 30 \\ & \hline \end{aligned}$ | $\begin{gathered} 40 \\ 0 \end{gathered}$ |  | $\begin{array}{\|r\|} \hline 11 \\ \hline \end{array}$ | $\begin{array}{r} 29 \\ 0 \end{array}$ | $\begin{aligned} & \hline 18 \\ & 11 \end{aligned}$ | $\begin{array}{\|l} \hline 12 \\ 42 \\ \hline \end{array}$ |  | 11 | $\begin{aligned} & \mathbf{3 1} \\ & 59 \end{aligned}$ | $\begin{aligned} & 32 \\ & 52 \end{aligned}$ | $\begin{aligned} & 37 \\ & 17 \end{aligned}$ |  | 11 | $\begin{array}{\|l} 13 \\ 59 \\ \hline \end{array}$ | $\begin{array}{\|l} 50 \\ 31 \\ \hline \end{array}$ | $\begin{array}{r} 5 \\ 4^{6} \\ \hline \end{array}$ |  | 10 | $\begin{array}{\|l\|} \hline 35 \\ 59 \\ \hline \end{array}$ | $\begin{array}{r} 5 \\ 10 \end{array}$ | $\begin{array}{r} 6 \\ 11 \end{array}$ | 39 |
| 40 | 16 | $\begin{array}{r} 12 \\ 1 \end{array}$ | $\begin{aligned} & 8 \\ & 0 \end{aligned}$ | $\begin{aligned} & 42 \\ & 29 \end{aligned}$ | $\begin{aligned} & 40 \\ & 42 \end{aligned}$ | 17 | $\begin{array}{r} 12 \\ 1 \end{array}$ | $\begin{gathered} 29 \\ 0 \end{gathered}$ | $\begin{aligned} & 29 \\ & 11 \end{aligned}$ | $\begin{aligned} & 54 \\ & 22 \end{aligned}$ | 18 | 12 | $\begin{aligned} & \mathbf{3 1} \\ & 59 \end{aligned}$ | $\begin{aligned} & 24 \\ & 51 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 54 \\ 57 \end{array}$ | 19 | 12 | $\begin{array}{\|l} \mathbf{1 3} \\ 59 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \mathbf{2 1} \\ 31 \\ \hline \end{array}$ | $\left\lvert\, \begin{aligned} & \mathbf{5 1} \\ & \mathbf{2 6} \end{aligned}\right.$ | 20 | 11 | $\begin{array}{\|l} 34 \\ 59 \\ \hline \end{array}$ | $\begin{array}{r} 15 \\ 9 \\ \hline \end{array}$ | $\begin{array}{\|l} \mathbf{1 7} \\ 49 \\ \hline \end{array}$ | 40 |
| $4^{1}$ |  | $\begin{array}{\|r\|} \hline 13 \\ 1 \end{array}$ | $\begin{aligned} & \mathbf{9} \\ & 0 \end{aligned}$ | $\begin{aligned} & 12 \\ & 29 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 22 \\ 25 \\ \hline \end{array}$ |  | $\begin{array}{r} 13 \\ 1 \end{array}$ | $\begin{array}{r} 29 \\ 0 \end{array}$ | $\begin{array}{\|l\|} \hline \mathbf{4 1} \\ 11 \end{array}$ | $\begin{array}{r} \hline 16 \\ 4 \\ \hline \end{array}$ |  | 13 | $\begin{aligned} & \mathbf{3 1} \\ & 59 \end{aligned}$ | $\begin{array}{\|l\|} \hline 16 \\ 51 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline \mathbf{5 1} \\ 37 \\ \hline \end{array}$ |  | 13 | $\begin{array}{\|l} \hline \mathbf{1 2} \\ 59 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 53 \\ 31 \\ \hline \end{array}$ | $\begin{array}{r} 17 \\ \hline 4 \\ \hline \end{array}$ |  | 12 | $\begin{array}{\|l} \hline 33 \\ 59 \\ \hline \end{array}$ | $\begin{array}{r} 25 \\ \hline 9 \\ \hline \end{array}$ | $\begin{array}{r} 6 \\ 27 \\ \hline \end{array}$ | 41 |
| 42 |  | $\begin{array}{\|r\|} \hline 14 \\ 1 \end{array}$ | $\begin{aligned} & \mathbf{9} \\ & 0 \end{aligned}$ | $\begin{aligned} & \mathbf{4 1} \\ & \mathbf{2 9} \end{aligned}$ | $\begin{array}{r} 47 \\ \hline \end{array}$ |  | $\begin{array}{r} 14 \\ 1 \end{array}$ | $\begin{gathered} 29 \\ 0 \end{gathered}$ | $\begin{aligned} & 5^{2} \\ & 10 \end{aligned}$ | $\begin{array}{\|l\|} \hline 20 \\ 45 \\ \hline \end{array}$ |  | 14 | $\begin{aligned} & \mathbf{3 1} \\ & 59 \end{aligned}$ | $\begin{array}{\|r\|} \hline 8 \\ 51 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 28 \\ 17 \\ \hline \end{array}$ |  | 14 | $\begin{array}{\|l} \hline \mathbf{1 2} \\ 59 \\ \hline \end{array}$ | $\begin{array}{\|l} 24 \\ 30 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 21 \\ 44 \\ \hline \end{array}$ |  | 13 | $\begin{array}{\|l\|} \hline \mathbf{3 2}^{2} \\ 59 \\ \hline \end{array}$ | $\begin{array}{r} 34 \\ \hline 9 \\ \hline \end{array}$ | $\begin{array}{r} 33 \\ \hline 4 \\ \hline \end{array}$ | 42 |
| 43 |  | $\begin{array}{\|r\|} \hline 15 \\ 1 \end{array}$ | $\begin{array}{r} 10 \\ 0 \end{array}$ | $\begin{array}{\|l} 10 \\ 28 \end{array}$ | $\begin{array}{\|l\|} \hline 54 \\ 49 \end{array}$ |  | $\begin{array}{r} 15 \\ 1 \end{array}$ | $\begin{gathered} 30 \\ 0 \end{gathered}$ | $\begin{array}{r} 3 \\ 10 \end{array}$ | $\begin{array}{r} 5 \\ 26 \\ \hline \end{array}$ |  | 15 | $\begin{aligned} & 3 \mathbf{3 0} \\ & 59 \end{aligned}$ | $\begin{aligned} & 59 \\ & 50 \\ & \hline \end{aligned}$ | $\begin{aligned} & 45 \\ & 57 \\ & \hline \end{aligned}$ |  | 15 | $\begin{array}{\|l\|} \mathbf{1 1} \\ 59 \\ \hline \end{array}$ | $\begin{array}{\|l} 55 \\ 30 \\ \hline \end{array}$ | $\begin{array}{r} 5 \\ 22 \end{array}$ |  | 14 | $\begin{array}{\|l} \hline \mathbf{3 1} \\ 59 \\ \hline \end{array}$ | $\begin{array}{r} 43 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 37 \\ 43 \\ \hline \end{array}$ | 43 |
| 44 |  | $\begin{array}{\|r\|} \hline 16 \\ 1 \\ \hline \end{array}$ | $\begin{array}{r} 10 \\ 0 \\ \hline \end{array}$ | $\begin{aligned} & 39 \\ & 28 \\ & \hline \end{aligned}$ | $\begin{aligned} & 43 \\ & 3^{1} \\ & \hline \end{aligned}$ |  | $\begin{array}{r} 16 \\ 1 \\ \hline \end{array}$ | $\begin{gathered} 30 \\ 0 \end{gathered}$ | $\begin{aligned} & 13 \\ & 10 \end{aligned}$ | $\begin{array}{r} \mathbf{3 1} \\ 7 \\ \hline \end{array}$ |  | 16 | $\begin{aligned} & \mathbf{3 0} \\ & 59 \end{aligned}$ | $\begin{aligned} & 50 \\ & 50 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 42 \\ 37 \\ \hline \end{array}$ |  | 16 | $\begin{array}{\|l\|} \mathbf{1 1} \\ 59 \\ \hline \end{array}$ | $\begin{array}{\|l} 25 \\ 30 \\ \hline \end{array}$ | $\begin{array}{r} 27 \\ 1 \end{array}$ |  | 15 | $\begin{aligned} & 30 \\ & 59 \\ & \hline \end{aligned}$ | $\begin{array}{r} 52 \\ 8 \end{array}$ | $\begin{array}{\|l} \hline 20 \\ 20 \\ \hline \end{array}$ | 44 |
| 45 |  | $\mathbf{1 7}$ | $\begin{array}{r} 11 \\ 0 \end{array}$ | $\begin{array}{r} 8 \\ 28 \end{array}$ | $\begin{array}{\|l\|} 14 \\ 13 \\ \hline \end{array}$ |  | $\begin{array}{r} 17 \\ 1 \end{array}$ | $\begin{gathered} 30 \\ 0 \end{gathered}$ | $\begin{array}{r} 23 \\ 9 \\ \hline \end{array}$ | $\begin{aligned} & 38 \\ & 48 \\ & \hline \end{aligned}$ |  | 17 | $\begin{aligned} & 30 \\ & 59 \end{aligned}$ | $\begin{aligned} & 41 \\ & 50 \\ & \hline \end{aligned}$ | $\begin{aligned} & 19 \\ & 17 \end{aligned}$ |  | 17 | $\begin{array}{\|l} \mathbf{1 0} \\ 59 \\ \hline \end{array}$ | $\begin{array}{\|l} 55 \\ 29 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 28 \\ 40 \\ \hline \end{array}$ |  | 16 | $\begin{aligned} & 30 \\ & 59 \\ & \hline \end{aligned}$ | $\begin{aligned} & \hline \mathbf{o} \\ & 7 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 40 \\ 58 \\ \hline \end{array}$ | 45 |
| 46 |  | $\begin{array}{r} 18 \\ 1 \end{array}$ | $\begin{array}{r} 11 \\ 0 \end{array}$ | $\begin{aligned} & 36 \\ & 27 \\ & \hline \end{aligned}$ | $\begin{aligned} & 27 \\ & 56 \\ & \hline \end{aligned}$ |  | $\begin{array}{r} 18 \\ 1 \end{array}$ | $\begin{gathered} 30 \\ 0 \end{gathered}$ | $\begin{array}{r} 33 \\ \hline 9 \end{array}$ | $\begin{aligned} & 26 \\ & 29 \end{aligned}$ |  | 18 | $\begin{aligned} & 3 \mathbf{3 0} \\ & 59 \end{aligned}$ | $\begin{array}{\|l\|} \hline \mathbf{3 1} \\ 49 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 36 \\ 56 \\ \hline \end{array}$ |  | 18 | $\begin{array}{\|l} \mathbf{1 0} \\ 59 \\ \hline \end{array}$ | $\begin{array}{\|l} 25 \\ 29 \\ \hline \end{array}$ | $\begin{array}{\|r} 8 \\ 19 \\ \hline \end{array}$ |  | 17 | $\begin{array}{\|l\|} \hline 29 \\ 59 \\ \hline \end{array}$ | $\begin{aligned} & 8 \\ & 7 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 38 \\ 35 \\ \hline \end{array}$ | 46 |
| 47 |  | $\begin{array}{r} 19 \\ 1 \end{array}$ | $\begin{array}{r} 12 \\ 0 \end{array}$ | $\begin{array}{r} 4 \\ 27 \\ \hline \end{array}$ | $\begin{array}{\|l} 23 \\ 37 \\ \hline \end{array}$ |  | $\begin{array}{r} 19 \\ 1 \end{array}$ | $\begin{gathered} 30 \\ 0 \end{gathered}$ | $\begin{array}{r} 42 \\ 9 \end{array}$ | $\begin{array}{\|l\|} \hline 55 \\ 10 \end{array}$ |  | 19 | $\begin{aligned} & 30 \\ & 59 \end{aligned}$ | $\begin{array}{\|l} \mathbf{2 1} \\ 49 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline \mathbf{3 2} \\ 37 \\ \hline \end{array}$ |  | 19 | $\begin{array}{r} 9 \\ 59 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 54 \\ 28 \end{array}$ | $\begin{array}{\|l} \mathbf{2 7} \\ 58 \\ \hline \end{array}$ |  | 18 | $\begin{aligned} & \mathbf{2 8} \\ & 59 \end{aligned}$ | $\begin{array}{r} 16 \\ 7 \end{array}$ | $\begin{array}{\|l\|} \hline 13 \\ 14 \\ \hline \end{array}$ | 47 |
| 48 |  | $\begin{array}{r} 20 \\ 1 \end{array}$ | $\begin{array}{r} 12 \\ 0 \end{array}$ | $\begin{aligned} & 32 \\ & 27 \end{aligned}$ | $\begin{gathered} 0 \\ 20 \end{gathered}$ |  | $\begin{array}{r} 20 \\ 1 \end{array}$ | $\begin{gathered} 30 \\ 0 \end{gathered}$ | $\begin{array}{r} 52 \\ 8 \end{array}$ | $\begin{array}{r} 5 \\ 51 \end{array}$ |  | 20 | $\begin{aligned} & \mathbf{3 0} \\ & 59 \end{aligned}$ | $\begin{array}{\|l\|} \hline \mathbf{1 1} \\ 49 \\ \hline \end{array}$ | $\begin{array}{r} 9 \\ 17 \\ \hline \end{array}$ |  | 20 | $\begin{array}{r} 9 \\ 59 \\ \hline \end{array}$ | $\begin{aligned} & 23 \\ & 28 \end{aligned}$ | $\begin{aligned} & 25 \\ & 36 \end{aligned}$ |  | 19 | $\begin{aligned} & 27 \\ & 59 \end{aligned}$ | $\begin{array}{r} 23 \\ \hline 6 \end{array}$ | $\begin{aligned} & 27 \\ & 51 \\ & \hline \end{aligned}$ | 48 |
| 49 |  | $\begin{array}{r} 21 \\ 1 \end{array}$ | $\begin{array}{r} 12 \\ 0 \end{array}$ | $\begin{aligned} & 59 \\ & 27 \end{aligned}$ | $\begin{array}{\|r} 20 \\ 1 \end{array}$ |  | $\begin{array}{r} 21 \\ 1 \end{array}$ | $\begin{gathered} \mathbf{3}^{\mathbf{1}} \\ 0 \end{gathered}$ | $\begin{aligned} & \mathbf{o} \\ & 8 \end{aligned}$ | $\begin{aligned} & 56 \\ & 32 \end{aligned}$ |  | 21 | $\begin{aligned} & 30 \\ & 59 \end{aligned}$ | $\begin{array}{r} \mathbf{o} \\ 4^{8} \\ \hline \end{array}$ | $\begin{aligned} & 26 \\ & 56 \end{aligned}$ |  | 21 | $\begin{array}{r} 8 \\ 59 \\ \hline \end{array}$ | $\begin{array}{\|l} \mathbf{5 2} \\ 28 \end{array}$ | $\begin{array}{r} 1 \\ 15 \\ \hline \end{array}$ |  | 20 | $\begin{aligned} & 26 \\ & 59 \end{aligned}$ | $\begin{array}{r} 30 \\ 6 \end{array}$ | $\begin{array}{\|l\|} \hline 18 \\ 29 \\ \hline \end{array}$ | 49 |
| 50 | 16 | $\begin{array}{r} 22 \\ 1 \end{array}$ | $\begin{array}{r} 13 \\ 0 \end{array}$ | $\begin{aligned} & 26 \\ & 26 \end{aligned}$ | $\begin{array}{\|l\|} \mathbf{2 1} \\ 44 \\ \hline \end{array}$ | 17 | $\begin{array}{r} 22 \\ 1 \end{array}$ | $\begin{gathered} 31 \\ 0 \end{gathered}$ | $\begin{aligned} & 9 \\ & 8 \end{aligned}$ | $\begin{array}{\|l\|} \hline 28 \\ 13 \\ \hline \end{array}$ | 18 | 22 | $\begin{aligned} & 29 \\ & 59 \end{aligned}$ | $\begin{array}{\|l} 49 \\ 48 \\ \hline \end{array}$ | $\begin{aligned} & 22 \\ & 36 \\ & \hline \end{aligned}$ | 19 | 22 | $\begin{array}{\|r} 8 \\ 59 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 20 \\ 27 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline \mathbf{1 6} \\ 54 \\ \hline \end{array}$ | 20 | 21 | $\begin{array}{\|l\|} \hline 25 \\ 59 \\ \hline \end{array}$ | $\begin{array}{r} 36 \\ \hline \end{array}$ | $\begin{array}{r} 47 \\ \hline \end{array}$ | 50 |
| 51 |  | $\begin{array}{\|r\|} \hline 23 \\ 1 \\ \hline \end{array}$ | $\begin{array}{\|r\|} \hline 13 \\ 0 \\ \hline \end{array}$ | $\begin{aligned} & 53 \\ & 26 \end{aligned}$ | $\begin{array}{r} 5 \\ 26 \end{array}$ |  | $\begin{gathered} 23 \\ 1 \end{gathered}$ | $\begin{array}{r} 31 \\ 0 \end{array}$ | $\begin{array}{r} 17 \\ 7 \end{array}$ | $\begin{aligned} & \mathbf{4 1} \\ & 54 \\ & \hline \end{aligned}$ |  | 23 | $\begin{aligned} & 29 \\ & 59 \end{aligned}$ | $\begin{aligned} & 37 \\ & 48 \\ & \hline \end{aligned}$ | $\begin{aligned} & 58 \\ & 16 \end{aligned}$ |  | 23 | $\begin{array}{\|r} 7 \\ 59 \\ \hline \end{array}$ | $\begin{aligned} & 48 \\ & 27 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \mathbf{1 0} \\ 33 \\ \hline \end{array}$ |  | 22 | $\begin{array}{\|l\|} \hline 24 \\ 59 \\ \hline \end{array}$ | $\begin{array}{r} 42 \\ 5 \\ \hline \end{array}$ | $\begin{aligned} & 53 \\ & 44 \end{aligned}$ | 51 |
| 52 |  | $\begin{array}{r} 24 \\ 1 \end{array}$ | $\begin{array}{\|r\|} \hline 14 \\ 0 \end{array}$ | $\begin{aligned} & 19 \\ & 26 \\ & \hline \end{aligned}$ | $\begin{array}{r} \mathbf{3 1} \\ 8 \\ \hline \end{array}$ |  | $\begin{array}{r} 24 \\ 1 \end{array}$ | $\begin{gathered} \mathbf{3 1}^{1} \\ 0 \end{gathered}$ | $\begin{array}{r} 25 \\ \hline 7 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 35 \\ 35 \\ \hline \end{array}$ |  | 24 | $\begin{aligned} & 29 \\ & 59 \end{aligned}$ | $\begin{array}{\|l\|} \hline 26 \\ 47 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 14 \\ 56 \\ \hline \end{array}$ |  | 24 | $\begin{array}{\|r} 7 \\ 59 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 15 \\ 27 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 43 \\ 11 \\ \hline \end{array}$ |  | 23 | $\begin{array}{\|l\|} \hline 23 \\ 59 \\ \hline \end{array}$ | $\begin{array}{r} 48 \\ \hline 5 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 37 \\ 22 \\ \hline \end{array}$ | 52 |
| 53 |  | $\begin{array}{\|r\|} \hline 25 \\ 1 \\ \hline \end{array}$ | $\begin{array}{r} 14 \\ 0 \end{array}$ | $\begin{aligned} & 45 \\ & 25 \\ & \hline \end{aligned}$ | $\begin{aligned} & 39 \\ & 49 \\ & \hline \end{aligned}$ |  | $\begin{array}{r} 25 \\ 1 \end{array}$ | $\begin{array}{r} 31 \\ 0 \end{array}$ | $\begin{array}{r} 33 \\ \hline 7 \\ \hline \end{array}$ | $\begin{aligned} & 10 \\ & 16 \\ & \hline \end{aligned}$ |  | 25 | $\begin{aligned} & 29 \\ & 59 \end{aligned}$ | $\begin{array}{\|l\|} \hline 14 \\ 47 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 10 \\ 36 \\ \hline \end{array}$ |  | 25 | $\begin{array}{\|r} \mathbf{6} \\ 59 \\ \hline \end{array}$ | $\begin{aligned} & 42 \\ & 26 \end{aligned}$ | $\begin{array}{\|l} \mathbf{5 4} \\ 50 \\ \hline \end{array}$ |  | 24 | $\begin{array}{\|l} \hline 22 \\ 59 \\ \hline \end{array}$ | $\begin{array}{r} 53 \\ \hline \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 59 \\ 59 \\ \hline \end{array}$ | 53 |
| 54 |  | $\begin{array}{r} 26 \\ 1 \end{array}$ | $\begin{array}{r\|} 15 \\ 0 \end{array}$ | $\begin{aligned} & 11 \\ & 25 \end{aligned}$ | $\begin{aligned} & 28 \\ & 32 \end{aligned}$ |  | $\begin{array}{r} 26 \\ 1 \end{array}$ | $\begin{gathered} 31 \\ 0 \end{gathered}$ | $\begin{array}{r} 40 \\ \hline \end{array}$ | $\begin{aligned} & 26 \\ & 56 \end{aligned}$ |  | 26 | $\begin{aligned} & 29 \\ & 59 \end{aligned}$ | $\begin{array}{\|r} \hline \mathbf{1} \\ 47 \end{array}$ | $\begin{aligned} & 46 \\ & 15 \\ & \hline \end{aligned}$ |  | 26 | $\begin{array}{r} 6 \\ 59 \end{array}$ | $\begin{array}{r} 9 \\ 26 \end{array}$ | $\begin{array}{\|l\|} \hline 44 \\ 29 \end{array}$ |  | 25 | $\begin{aligned} & \mathbf{2 1} \\ & 59 \end{aligned}$ | $\begin{array}{r} 58 \\ \hline 4 \end{array}$ | $\begin{aligned} & 58 \\ & 37 \\ & \hline \end{aligned}$ | 54 |
| 55 |  | $27$ | $\begin{array}{r} 15 \\ 0 \end{array}$ | $\begin{aligned} & 37 \\ & 25 \\ & \hline \end{aligned}$ | $\begin{array}{r} 0 \\ 14 \\ \hline \end{array}$ |  | $\begin{array}{r} 27 \\ 1 \end{array}$ | $\begin{gathered} 31 \\ 0 \end{gathered}$ | $\begin{array}{r} 47 \\ \hline 6 \end{array}$ | $\begin{aligned} & 22 \\ & 38 \\ & \hline \end{aligned}$ |  | 27 | $\begin{aligned} & \mathbf{2 8} \\ & 59 \end{aligned}$ | $\begin{aligned} & 49 \\ & 46 \\ & \hline \end{aligned}$ | $\begin{array}{\|r} \hline \mathbf{1} \\ 56 \\ \hline \end{array}$ |  | 27 | $\begin{array}{\|r} \hline 5 \\ 59 \\ \hline \end{array}$ | $\begin{aligned} & 36 \\ & 26 \end{aligned}$ | $\begin{array}{\|r} 13 \\ 8 \end{array}$ |  | 26 | $\begin{aligned} & \mathbf{2 1} \\ & 59 \end{aligned}$ | $\begin{aligned} & 3 \\ & 4 \end{aligned}$ | $\begin{array}{\|l\|} \hline 35 \\ 15 \\ \hline \end{array}$ | 55 |
| 56 |  | $\begin{array}{\|r\|} \hline 28 \\ 1 \end{array}$ | $\begin{array}{r} 16 \\ 0 \end{array}$ | $\begin{array}{r} 2 \\ 24 \\ \hline \end{array}$ | $\begin{array}{\|l} 14 \\ 56 \\ \hline \end{array}$ |  | $\begin{array}{r} 28 \\ 1 \end{array}$ | $\begin{gathered} \mathbf{3 1} \\ 0 \end{gathered}$ | $\begin{array}{r} 54 \\ \hline 6 \end{array}$ | $\begin{array}{r} \mathbf{0} \\ 18 \\ \hline \end{array}$ |  | 28 | $\begin{aligned} & \mathbf{2 8} \\ & 59 \end{aligned}$ | $\begin{array}{\|l\|} \hline 35 \\ 46 \\ \hline \end{array}$ | $\begin{aligned} & 57 \\ & 35 \\ & \hline \end{aligned}$ |  | 28 | $\begin{array}{\|r} \hline 5 \\ 59 \\ \hline \end{array}$ | $\begin{array}{r} 2 \\ 25 \\ \hline \end{array}$ | $\begin{aligned} & \hline 21 \\ & 46 \\ & \hline \end{aligned}$ |  | 27 | $\begin{array}{\|l\|} \hline 20 \\ 59 \\ \hline \end{array}$ | $\begin{aligned} & 7 \\ & 3 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 50 \\ 52 \\ \hline \end{array}$ | 56 |
| 57 |  | $\begin{array}{r} 29 \\ 1 \end{array}$ | $\begin{array}{r} 16 \\ 0 \end{array}$ | $\begin{aligned} & 27 \\ & 24 \end{aligned}$ | $\begin{array}{\|l} \mathbf{1 0} \\ 37 \\ \hline \end{array}$ |  | $\begin{array}{r} 29 \\ 1 \end{array}$ | $\begin{gathered} 3^{2} \\ 0 \end{gathered}$ | $\begin{aligned} & \hline \mathbf{0} \\ & 5 \\ & \hline \end{aligned}$ | $\begin{aligned} & \mathbf{1 8} \\ & 59 \\ & \hline \end{aligned}$ |  | 29 | $\begin{aligned} & \mathbf{2 8} \\ & 59 \end{aligned}$ | $\begin{aligned} & 22 \\ & 46 \\ & \hline \end{aligned}$ | $\begin{aligned} & 32 \\ & 14 \\ & \hline \end{aligned}$ |  | 29 | $\begin{array}{r} 4 \\ 59 \\ \hline \end{array}$ | $\begin{aligned} & 28 \\ & 25 \\ & \hline \end{aligned}$ | $\begin{array}{r} 7 \\ 25 \\ \hline \end{array}$ |  | 28 | $\begin{array}{\|l\|} \hline 19 \\ 59 \\ \hline \end{array}$ | $\begin{array}{r} \hline 11 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline \mathbf{4 2}^{2} \\ 30 \\ \hline \end{array}$ | 57 |
| 58 |  | $\begin{gathered} 30 \\ 1 \end{gathered}$ | $\begin{array}{r} 16 \\ 0 \end{array}$ | $\begin{aligned} & \mathbf{5 1} \\ & \mathbf{2 4} \end{aligned}$ | $\begin{aligned} & 47 \\ & 20 \end{aligned}$ |  | 30 1 | $\begin{gathered} 3^{2} \\ 0 \end{gathered}$ | 6 | $\begin{aligned} & 17 \\ & 40 \end{aligned}$ |  | 30 | $\begin{aligned} & \mathbf{2 8} \\ & 59 \end{aligned}$ | $\begin{array}{r} 8 \\ 45 \end{array}$ | $\begin{aligned} & 46 \\ & 55 \end{aligned}$ |  | 30 | $\begin{array}{r} 3 \\ 59 \end{array}$ | $\begin{array}{\|l} 53 \\ 25 \\ \hline \end{array}$ | $3^{2}$ |  | 29 | $\begin{array}{\|l\|} \hline \mathbf{1 8} \\ 59 \\ \hline \end{array}$ | $\begin{array}{r} 15 \\ \hline 3 \end{array}$ | $\begin{array}{r} 12 \\ 7 \\ \hline \end{array}$ | 58 |
| 59 |  | $\mathbf{3 1}_{1}$ | $\begin{array}{r} 17 \\ 0 \end{array}$ | $\begin{aligned} & 16 \\ & 24 \end{aligned}$ | $\begin{aligned} & 7 \\ & 1 \end{aligned}$ |  | $\begin{array}{r} 31 \\ 1 \end{array}$ | $\begin{gathered} 3^{2} \\ 0 \end{gathered}$ | $\begin{array}{r} 11 \\ \hline \end{array}$ | $\begin{aligned} & 57 \\ & 21 \end{aligned}$ |  | 31 | $\begin{aligned} & \mathbf{2 7} \\ & 59 \end{aligned}$ | $\begin{array}{\|l\|} \hline 54 \\ 45 \\ \hline \end{array}$ | $\begin{aligned} & \hline \mathbf{4 1} \\ & 34 \\ & \hline \end{aligned}$ |  | 31 | $\begin{array}{\|r} \hline 3 \\ 59 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 18 \\ 24 \\ \hline \end{array}$ | $\begin{aligned} & 35 \\ & 4^{2} \end{aligned}$ |  | 30 | $\begin{aligned} & \mathbf{1 7} \\ & 59 \end{aligned}$ | $\begin{array}{r} 18 \\ 2 \end{array}$ | $\begin{array}{\|l\|} \hline 19 \\ 44 \\ \hline \end{array}$ | 59 |
| 60 | 16 | $\left[\begin{array}{c} 3^{2} \\ 1 \end{array}\right.$ | $\begin{array}{r} 17 \\ 0 \end{array}$ | $\begin{array}{\|l} 40 \\ 23 \\ \hline \end{array}$ | $\begin{array}{\|r\|} \hline 8 \\ 43 \end{array}$ | 17 | $\begin{array}{r} 32 \\ 1 \end{array}$ | $\begin{gathered} 3^{2} \\ 0 \end{gathered}$ | $\begin{array}{r} 17 \\ 5 \end{array}$ | $\begin{array}{r} 18 \\ 1 \end{array}$ | 18 | 32 | $\begin{array}{\|} \mathbf{2 7} \\ 59 \\ \hline \end{array}$ | $\begin{aligned} & 40 \\ & 45 \end{aligned}$ | $\begin{aligned} & 15 \\ & 14 \end{aligned}$ | 19 | 32 | $\begin{array}{r} \mathbf{2} \\ 59 \\ \hline \end{array}$ | $\begin{array}{\|l} 43 \\ 24 \end{array}$ | $\left\lvert\, \begin{aligned} & 17 \\ & 20 \end{aligned}\right.$ | 20 | $3^{1}$ | $\begin{aligned} & \hline \mathbf{1 6} \\ & 59 \end{aligned}$ | $\begin{array}{r} 21 \\ 2 \end{array}$ | $\begin{array}{r} 3 \\ 23 \\ \hline \end{array}$ | 60 |

Bürgi's 1' sine table (reconstruction, D. Roegel, 2016)

| 1 | $20^{\circ}$ |  |  |  |  | $21^{\circ}$ |  |  |  |  | $22^{\circ}$ |  |  |  |  | $23^{\circ}$ |  |  |  |  | $24^{\circ}$ |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 0 | 20 | 31 | $\begin{array}{\|l\|} \hline \mathbf{1 6} \\ 59 \\ \hline \end{array}$ | $\begin{array}{\|r\|} \hline 21 \\ 2 \\ \hline \end{array}$ | $\begin{array}{r} 3 \\ 23 \\ \hline \end{array}$ | 21 | 30 | $\begin{array}{\|r} 7 \\ 58 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline \mathbf{2 8} \\ 39 \\ \hline \end{array}$ | $\begin{aligned} & 38 \\ & 19 \end{aligned}$ | 22 | 28 | $\begin{aligned} & 35 \\ & 58 \\ & \hline \end{aligned}$ | $\begin{array}{r} \mathbf{1} \\ \mathbf{1 5} \\ \hline \end{array}$ | $\begin{array}{\|l} 27 \\ 12 \end{array}$ | 23 | 26 | $\begin{array}{\|l} 37 \\ 57 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 55 \\ 50 \\ \hline \end{array}$ | $\begin{gathered} 26 \\ 0 \end{gathered}$ | 24 | 24 | $\begin{array}{\|l\|} \hline \mathbf{1 5} \\ 57 \\ \hline \end{array}$ | $\begin{array}{\|r} \hline 6 \\ 23 \\ \hline \end{array}$ | $\begin{array}{\|l} 54 \\ 45 \\ \hline \end{array}$ | 0 |
| 1 |  | 32 | $\begin{array}{\|l\|} \hline 15 \\ 59 \\ \hline \end{array}$ | $\begin{array}{\|r\|} \hline 23 \\ 1 \\ \hline \end{array}$ | $\begin{array}{\|c\|} \hline 26 \\ 59 \\ \hline \end{array}$ |  | 31 | $\begin{array}{r} 6 \\ 58 \\ \hline \end{array}$ | $\begin{array}{r} 7 \\ 3^{8} \\ \hline \end{array}$ | $\begin{array}{\|l} 57 \\ 55 \\ \hline \end{array}$ |  | 29 | $\begin{aligned} & 33 \\ & 58 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 16 \\ 14 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 39 \\ 47 \\ \hline \end{array}$ |  | 27 | $\begin{aligned} & 35 \\ & 57 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 45 \\ 49 \\ \hline \end{array}$ | $\begin{aligned} & 26 \\ & 35 \\ & \hline \end{aligned}$ |  | 25 | $\begin{array}{\|l} \hline 12 \\ 57 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 30 \\ 23 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 39 \\ 19 \\ \hline \end{array}$ | 1 |
| 2 |  | 33 | $\begin{aligned} & 14 \\ & 59 \end{aligned}$ | $\begin{array}{r} 25 \\ \hline 1 \end{array}$ | $\begin{aligned} & 25 \\ & 37 \\ & \hline \end{aligned}$ |  | 32 | $\begin{array}{r} 4 \\ 58 \\ \hline \end{array}$ | $\begin{aligned} & 46 \\ & 38 \end{aligned}$ | $\begin{aligned} & 52 \\ & 32 \end{aligned}$ |  | 30 | $\begin{aligned} & \mathbf{3 1} \\ & 58 \end{aligned}$ | $\begin{array}{\|l\|} \hline \mathbf{3 1} \\ 14 \\ \hline \end{array}$ | $\begin{aligned} & 26 \\ & 22 \end{aligned}$ |  | 28 | $\begin{aligned} & 33 \\ & 57 \\ & \hline \end{aligned}$ | $\begin{aligned} & \hline 35 \\ & 49 \\ & \hline \end{aligned}$ | $\begin{aligned} & \mathbf{1} \\ & 9 \\ & \hline \end{aligned}$ |  | 26 | $\begin{array}{r} 9 \\ 57 \\ \hline \end{array}$ | $\begin{aligned} & 53 \\ & 22 \end{aligned}$ | $\begin{aligned} & 58 \\ & 52 \\ & \hline \end{aligned}$ | 2 |
| 3 |  | 34 | $\begin{array}{\|l\|} \hline 13 \\ 59 \\ \hline \end{array}$ | $\begin{array}{\|r\|} \hline 27 \\ 1 \\ \hline \end{array}$ | $\begin{array}{r} 2 \\ 15 \\ \hline \end{array}$ |  | 33 | $\begin{array}{r} 3 \\ 58 \\ \hline \end{array}$ | $\begin{aligned} & 25 \\ & 3^{8} \\ & \hline \end{aligned}$ | $\begin{array}{r} 24 \\ 8 \end{array}$ |  | 31 | $\begin{array}{r} 29 \\ 58 \\ \hline \end{array}$ | $\begin{array}{\|l} 45 \\ 13 \\ \hline \end{array}$ | $\begin{aligned} & 48 \\ & 58 \\ & \hline \end{aligned}$ |  | 29 | $\begin{array}{\|l} \mathbf{3 1} \\ 57 \\ \hline \end{array}$ | $\begin{array}{\|} 24 \\ 48 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline \mathbf{1 0} \\ 43 \\ \hline \end{array}$ |  | 27 | $\begin{array}{\|r} \hline 7 \\ 57 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 16 \\ 22 \\ \hline \end{array}$ | $\begin{aligned} & 50 \\ & 26 \end{aligned}$ | 3 |
| 4 |  | 35 | $\begin{array}{\|l\|} 12 \\ 59 \\ \hline \end{array}$ | $\begin{array}{r} \hline 28 \\ 0 \end{array}$ | $\begin{array}{l\|} \hline 17 \\ 5^{2} \\ \hline \end{array}$ |  | 34 | $\begin{array}{r} 2 \\ 58 \\ \hline \end{array}$ | $\begin{array}{\|r} 3 \\ 37 \\ \hline \end{array}$ | $\begin{array}{\|l} 3^{2} \\ 45 \\ \hline \end{array}$ |  | 32 | $\begin{array}{\|l} 27 \\ 58 \\ \hline \end{array}$ | $\begin{array}{\|l} 59 \\ 13 \end{array}$ | $\begin{aligned} & 46 \\ & 33 \end{aligned}$ |  | 30 | $\begin{array}{\|} 29 \\ 57 \\ \hline \end{array}$ | $\begin{array}{\|l\|} 12 \\ 48 \\ \hline \end{array}$ | $\begin{array}{\|l} 53 \\ 17 \\ \hline \end{array}$ |  | 28 | $\begin{array}{r} 4 \\ 57 \\ \hline \end{array}$ | $39$ | $\begin{array}{\|l\|} \hline \mathbf{1 6} \\ 58 \\ \hline \end{array}$ | 4 |
| 5 |  | $3^{6}$ | $\begin{aligned} & \hline \mathbf{1 1} \\ & 59 \end{aligned}$ | $\begin{array}{r} 29 \\ 0 \\ \hline \end{array}$ | $\begin{array}{\|r} 9 \\ 30 \\ \hline \end{array}$ |  | 35 | $\begin{array}{r} \mathbf{o} \\ 58 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{4 1} \\ & \mathbf{3 7} \end{aligned}$ | $\begin{aligned} & 17 \\ & 21 \end{aligned}$ |  | 33 | $\begin{aligned} & 26 \\ & 58 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 13 \\ 13 \\ \hline \end{array}$ | $\begin{array}{r} 19 \\ 8 \end{array}$ |  | 31 | $\begin{array}{\|} \mathbf{2 7} \\ 57 \\ \hline \end{array}$ | $\begin{array}{r} 1 \\ 47 \\ \hline \end{array}$ | $\begin{aligned} & 10 \\ & 52 \\ & \hline \end{aligned}$ |  | 29 | $\begin{array}{r} 2 \\ 57 \end{array}$ | 1 | $\begin{array}{\|l} 14 \\ 3^{2} \\ \hline \end{array}$ | 5 |
| 6 |  | 37 | $\begin{array}{\|l\|} \mathbf{1 0} \\ 59 \\ \hline \end{array}$ | $\begin{array}{r} 29 \\ 0 \end{array}$ | $\begin{array}{r} 39 \\ 6 \end{array}$ |  | 35 | $\begin{aligned} & 59 \\ & 58 \\ & \hline \end{aligned}$ | $\begin{aligned} & 18 \\ & 36 \end{aligned}$ | $\begin{aligned} & 38 \\ & 57 \end{aligned}$ |  | 34 | $\begin{array}{r} 24 \\ 58 \\ \hline \end{array}$ | $\begin{aligned} & 26 \\ & 12 \end{aligned}$ | $\begin{array}{\|l} \mathbf{2 7} \\ 43 \\ \hline \end{array}$ |  | 32 | $\begin{array}{\|} \mathbf{2 4} \\ 57 \\ \hline \end{array}$ | $\begin{aligned} & 49 \\ & 47 \end{aligned}$ | $\begin{array}{r} 2 \\ 26 \end{array}$ |  | 29 | $\begin{aligned} & 59 \\ & 57 \end{aligned}$ | $\begin{aligned} & 22 \\ & 21 \end{aligned}$ | $\begin{array}{r} 46 \\ 5 \end{array}$ | 6 |
| 7 |  | $3^{8}$ | $\begin{array}{r} 9 \\ 58 \\ \hline \end{array}$ | $\begin{aligned} & 29 \\ & 59 \\ & \hline \end{aligned}$ | $\begin{aligned} & 45 \\ & 44 \\ & \hline \end{aligned}$ |  | $3^{6}$ | $\begin{aligned} & 57 \\ & 58 \\ & \hline \end{aligned}$ | $\begin{aligned} & 55 \\ & 36 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 35 \\ 34 \\ \hline \end{array}$ |  | 35 | $\begin{aligned} & 22 \\ & 58 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 39 \\ 12 \end{array}$ | $\begin{array}{\|l} \mathbf{1 0} \\ \mathbf{1 9} \\ \hline \end{array}$ |  | 33 | $\begin{aligned} & 22 \\ & 57 \\ & \hline \end{aligned}$ | $\begin{aligned} & 36 \\ & 47 \end{aligned}$ | $\begin{gathered} 28 \\ 0 \end{gathered}$ |  | 30 | $\begin{array}{\|l} \hline 56 \\ 57 \\ \hline \end{array}$ | $\begin{aligned} & 43 \\ & 20 \end{aligned}$ | $\begin{array}{\|l\|l} \mathbf{5 1} \\ 38 \\ \hline \end{array}$ | 7 |
| 8 |  | 39 | $\begin{array}{\|r\|} \hline 8 \\ 58 \\ \hline \end{array}$ | $\begin{aligned} & 29 \\ & 59 \end{aligned}$ | $\begin{aligned} & 29 \\ & 22 \\ & \hline \end{aligned}$ |  | 37 | $\begin{aligned} & 56 \\ & 58 \\ & \hline \end{aligned}$ | $\begin{aligned} & 32 \\ & 36 \\ & \hline \end{aligned}$ | $\begin{array}{r} 9 \\ 10 \end{array}$ |  | 36 | $\begin{aligned} & 20 \\ & 58 \\ & \hline \end{aligned}$ | $\begin{aligned} & \mathbf{5 1} \\ & \mathbf{1 1} \end{aligned}$ | $\begin{aligned} & 29 \\ & 54 \end{aligned}$ |  | 34 | $\begin{aligned} & 20 \\ & 57 \end{aligned}$ | $\begin{aligned} & 23 \\ & 46 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 28 \\ 34 \\ \hline \end{array}$ |  | 31 | $\begin{array}{\|} \mathbf{5 4} \\ \mathbf{5 7} \\ \hline \end{array}$ | $\begin{array}{r} 4 \\ 20 \end{array}$ | $\begin{array}{\|l\|} \hline 29 \\ 11 \end{array}$ | 8 |
| 9 |  | 40 | $\begin{array}{r} 7 \\ 58 \\ \hline \end{array}$ | $\begin{aligned} & 28 \\ & 58 \end{aligned}$ | $\begin{aligned} & \mathbf{5 1} \\ & 59 \\ & \hline \end{aligned}$ |  | $3^{8}$ | $\begin{aligned} & 55 \\ & 58 \\ & \hline \end{aligned}$ | $\begin{array}{r} 8 \\ 35 \end{array}$ | $\begin{aligned} & 19 \\ & 46 \\ & \hline \end{aligned}$ |  | 37 | $\begin{aligned} & 19 \\ & 58 \\ & \hline \end{aligned}$ | $\begin{array}{r} 3 \\ 11 \end{array}$ | $\begin{array}{\|l} 23 \\ 29 \\ \hline \end{array}$ |  | 35 | $\begin{aligned} & \hline \mathbf{1 8} \\ & 57 \end{aligned}$ | $\begin{array}{\|l} 10 \\ 46 \end{array}$ | $\begin{aligned} & 2 \\ & 8 \end{aligned}$ |  | 32 | $\begin{array}{\|l} \mathbf{5 1} \\ \mathbf{5 7} \\ \hline \end{array}$ | $\begin{array}{\|l} 24 \\ 19 \\ \hline \end{array}$ | $\begin{aligned} & 40 \\ & 44 \end{aligned}$ | 9 |
| 10 | 20 | 41 | $\begin{array}{\|r\|} \hline 6 \\ 58 \\ \hline \end{array}$ | $\begin{aligned} & 27 \\ & 58 \\ & \hline \end{aligned}$ | $\begin{aligned} & 50 \\ & 36 \\ & 36 \end{aligned}$ | 21 | 39 | $\begin{aligned} & 53 \\ & 58 \\ & \hline \end{aligned}$ | $\begin{aligned} & 44 \\ & 35 \\ & \hline \end{aligned}$ | $\begin{array}{r} 5 \\ 22 \end{array}$ | 22 | 38 | $\begin{aligned} & \mathbf{1 7} \\ & 58 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} 14 \\ 11 \end{array}$ | $\begin{array}{r} 5^{2} \\ 4 \end{array}$ | 23 | 36 | $\begin{array}{\|l} 15 \\ 57 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 56 \\ 45 \\ \hline \end{array}$ | $\begin{aligned} & \hline 10 \\ & 42 \\ & \hline \end{aligned}$ | 24 | 33 | $\begin{array}{\|l} 48 \\ 57 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 44 \\ 19 \\ \hline \end{array}$ | $\begin{array}{\|l} 24 \\ 17 \\ \hline \end{array}$ |  |
| 11 |  | 42 | $\begin{array}{r} 5 \\ 58 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 26 \\ 58 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 26 \\ 14 \\ \hline \end{array}$ |  | 40 | $\begin{aligned} & \mathbf{5 2} \\ & 58 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 19 \\ 34 \\ \hline \end{array}$ | $\begin{aligned} & 27 \\ & 59 \end{aligned}$ |  | 39 | $\begin{aligned} & 15 \\ & 58 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 25 \\ 10 \\ \hline \end{array}$ | $\begin{aligned} & 56 \\ & 40 \\ & \hline \end{aligned}$ |  | 37 | $\begin{array}{\|l} \hline \mathbf{1 3} \\ 57 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline \mathbf{4 1} \\ 45 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline \mathbf{5}^{2} \\ 17 \\ \hline \end{array}$ |  | 34 | $\begin{array}{\|l} \hline 46 \\ 57 \\ \hline \end{array}$ | $\begin{array}{r} 3 \\ 18 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline \mathbf{4 1} \\ 50 \\ \hline \end{array}$ |  |
| 12 |  | 43 | $\begin{array}{r} 4 \\ 58 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 24 \\ 57 \\ \hline \end{array}$ | $\begin{aligned} & 40 \\ & 50 \\ & \hline \end{aligned}$ |  | 41 | $\begin{aligned} & 50 \\ & 58 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 54 \\ 34 \\ \hline \end{array}$ | $\begin{aligned} & 26 \\ & 34 \\ & \hline \end{aligned}$ |  | 40 | $\begin{aligned} & 13 \\ & 58 \\ & \hline \end{aligned}$ | $\begin{aligned} & 36 \\ & 10 \end{aligned}$ | $\begin{array}{\|l} \hline 36 \\ 14 \\ \hline \end{array}$ |  | $3^{8}$ | $\begin{aligned} & \mathbf{1 1} \\ & 57 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 27 \\ 44 \\ \hline \end{array}$ | $\begin{array}{r} 9 \\ 50 \\ \hline \end{array}$ |  | 35 | $\begin{array}{\|l} \hline 43 \\ 57 \\ \hline \end{array}$ | $\begin{aligned} & 22 \\ & 18 \end{aligned}$ | $\begin{array}{\|l} \hline 31 \\ \mathbf{2 3} \\ \hline \end{array}$ |  |
| 13 |  | 44 | $\begin{array}{r} \mathbf{3} \\ 58 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 22 \\ 57 \\ \hline \end{array}$ | $\begin{aligned} & 30 \\ & 28 \\ & \hline \end{aligned}$ |  | 42 | $\begin{aligned} & 49 \\ & 58 \\ & \hline \end{aligned}$ | $\begin{aligned} & 29 \\ & 34 \\ & \hline \end{aligned}$ | $\begin{array}{r} \mathbf{0} \\ 11 \\ \hline \end{array}$ |  | 41 | $\begin{array}{\|l\|} \mathbf{1 1} \\ 58 \\ \hline \end{array}$ | $\begin{array}{r} 46 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{5 0} \\ & 50 \end{aligned}$ |  | 39 | $\begin{array}{r} 9 \\ 57 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline \mathbf{1 1} \\ 44 \\ \hline \end{array}$ | $\begin{array}{\|l} 59 \\ 25 \\ \hline \end{array}$ |  | 36 | $\begin{array}{\|l} \hline 40 \\ 57 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline \mathbf{4 0} \\ 17 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 54 \\ 57 \\ \hline \end{array}$ |  |
| 14 |  | 45 | $\begin{array}{\|r\|} \hline 2 \\ 58 \\ \hline \end{array}$ | $\begin{aligned} & 19 \\ & 57 \end{aligned}$ | $\begin{array}{r} 58 \\ 6 \\ \hline \end{array}$ |  | 43 | $\begin{aligned} & 48 \\ & 58 \\ & \hline \end{aligned}$ | $\begin{array}{r} \mathbf{3} \\ 33 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline \mathbf{1 1} \\ 48 \\ \hline \end{array}$ |  | 42 | $\begin{array}{r} 9 \\ 58 \\ \hline \end{array}$ | $\begin{array}{r} 56 \\ \hline 9 \\ \hline \end{array}$ | $\begin{aligned} & 40 \\ & 25 \\ & \hline \end{aligned}$ |  | 40 | $\begin{array}{r} 6 \\ 57 \\ \hline \end{array}$ | $\begin{aligned} & 56 \\ & 43 \end{aligned}$ | $\begin{aligned} & 24 \\ & 59 \\ & \hline \end{aligned}$ |  | 37 | $\begin{array}{\|l} \hline 37 \\ 57 \\ \hline \end{array}$ | $\begin{array}{\|l} 58 \\ 17 \\ \hline \end{array}$ | $\begin{array}{\|l} \mathbf{5 1} \\ \mathbf{2 9} \\ \hline \end{array}$ |  |
| 15 |  | 46 | $\begin{array}{\|r\|} \hline \mathbf{1} \\ 58 \\ \hline \end{array}$ | $\begin{aligned} & 17 \\ & 56 \\ & \hline \end{aligned}$ | $\begin{array}{r} 4 \\ 42 \\ \hline \end{array}$ |  | 44 | $\begin{aligned} & 46 \\ & 58 \end{aligned}$ | $\begin{array}{\|l\|} \hline 36 \\ 33 \\ \hline \end{array}$ | $\begin{aligned} & 59 \\ & 23 \end{aligned}$ |  | 43 | $\begin{array}{r} 8 \\ 58 \\ \hline \end{array}$ | $\begin{aligned} & \hline 6 \\ & 9 \\ & \hline \end{aligned}$ | $\begin{aligned} & 5 \\ & 0 \\ & \hline \end{aligned}$ |  | 41 | $\begin{array}{r} 4 \\ 57 \\ \hline \end{array}$ | $\begin{array}{\|l} 40 \\ 43 \\ \hline \end{array}$ | $\begin{array}{\|l} 23 \\ 32 \\ \hline \end{array}$ |  | $3^{8}$ | $\begin{aligned} & 35 \\ & 57 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 16 \\ 17 \\ \hline \end{array}$ | $\begin{array}{r} 20 \\ 2 \end{array}$ |  |
| 16 |  | 47 | $\begin{array}{r} \mathbf{0} \\ 58 \\ \hline \end{array}$ | $\begin{aligned} & 13 \\ & 56 \\ & \hline \end{aligned}$ | $\begin{aligned} & 46 \\ & 20 \\ & \hline \end{aligned}$ |  | 45 | $\begin{aligned} & 45 \\ & 58 \\ & \hline \end{aligned}$ | $\begin{array}{l\|} 10 \\ 32 \end{array}$ | $\begin{aligned} & \mathbf{2 2} \\ & 59 \end{aligned}$ |  | 44 | $\begin{array}{r} 6 \\ 58 \\ \hline \end{array}$ | $\begin{array}{r} 15 \\ \hline 8 \end{array}$ | $\begin{array}{r} 5 \\ 35 \\ \hline \end{array}$ |  | 42 | $\begin{array}{r} \mathbf{2} \\ 57 \\ \hline \end{array}$ | $\begin{array}{\|l} 23 \\ 43 \\ \hline \end{array}$ | $\begin{array}{r} 55 \\ 7 \\ \hline \end{array}$ |  | 39 | $\begin{array}{\|l} \hline \mathbf{3 2} \\ 57 \\ \hline \end{array}$ | $\begin{aligned} & 33 \\ & 16 \end{aligned}$ | $\begin{array}{\|l} 22 \\ 35 \\ \hline \end{array}$ |  |
| 17 |  | 47 | $\begin{aligned} & 59 \\ & 58 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 10 \\ 55 \\ \hline \end{array}$ | $\begin{array}{\|r\|} \hline 6 \\ 57 \\ \hline \end{array}$ |  | 46 | $\begin{aligned} & 43 \\ & 58 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 43 \\ 32 \\ \hline \end{array}$ | $\begin{aligned} & 21 \\ & 3^{6} \end{aligned}$ |  | 45 | $\begin{array}{r} 4 \\ 58 \\ \hline \end{array}$ | $\begin{array}{r} 23 \\ 8 \\ \hline \end{array}$ | $\begin{aligned} & 40 \\ & 10 \end{aligned}$ |  | 43 | $\begin{array}{\|r} \hline \mathbf{o} \\ 57 \\ \hline \end{array}$ | $\begin{array}{r} 7 \\ 4^{2} \\ \hline \end{array}$ | $\begin{array}{\|r} \hline 2 \\ 41 \\ \hline \end{array}$ |  | 40 | $\begin{array}{\|l} 29 \\ 57 \\ \hline \end{array}$ | $\begin{aligned} & 49 \\ & 16 \\ & \hline \end{aligned}$ | $\begin{array}{r} 57 \\ \hline 8 \end{array}$ |  |
| 18 |  | 48 | $\begin{aligned} & \mathbf{5 8} \\ & 58 \end{aligned}$ | $\begin{array}{r} 6 \\ 55 \\ \hline \end{array}$ | $\begin{array}{r} 3 \\ 34 \\ \hline \end{array}$ |  | 47 | $\begin{aligned} & 42 \\ & 58 \\ & \hline \end{aligned}$ | $\begin{aligned} & 15 \\ & 32 \end{aligned}$ | $\begin{array}{\|l} 57 \\ 11 \end{array}$ |  | 46 | $\begin{array}{r} 2 \\ 58 \\ \hline \end{array}$ | $\begin{array}{\|r} \mathbf{3 1} \\ 7 \\ \hline \end{array}$ | $\begin{array}{\|l} 50 \\ 45 \\ \hline \end{array}$ |  | 43 | $\begin{array}{\|l} 57 \\ 57 \\ \hline \end{array}$ | $\begin{array}{\|l} 49 \\ 42 \\ \hline \end{array}$ | $\begin{aligned} & 43 \\ & 14 \end{aligned}$ |  | 41 | $\begin{array}{\|} \mathbf{2 7} \\ 57 \\ \hline \end{array}$ | $\begin{array}{r} 6 \\ 15 \\ \hline \end{array}$ | $\begin{array}{r} 5 \\ 41 \end{array}$ |  |
| 19 |  | 49 | $\begin{aligned} & 57 \\ & 58 \\ & \hline \end{aligned}$ | $\begin{array}{r} \mathbf{1} \\ 55 \\ \hline \end{array}$ | $\begin{array}{l\|\|} 37 \\ 11 \\ \hline \end{array}$ |  | 48 | $\begin{aligned} & 40 \\ & 58 \\ & \hline \end{aligned}$ | $\begin{aligned} & 48 \\ & 31 \end{aligned}$ | $\begin{array}{r} 8 \\ 48 \end{array}$ |  | 47 | $\begin{array}{r} \mathbf{0} \\ 58 \end{array}$ | $\begin{array}{\|r} 39 \\ 7 \end{array}$ | $\begin{array}{\|l\|} 35 \\ 20 \end{array}$ |  | 44 | $\begin{array}{\|l} 55 \\ 57 \\ \hline \end{array}$ | $\begin{array}{\|l} 3^{1} \\ 41 \\ \hline \end{array}$ | $\begin{array}{\|l} 57 \\ 49 \\ \hline \end{array}$ |  | 42 | $\begin{array}{\|} \mathbf{2 4} \\ 57 \\ \hline \end{array}$ | $\begin{array}{\|l} 21 \\ 15 \\ \hline \end{array}$ | $\begin{aligned} & 46 \\ & 14 \end{aligned}$ |  |
| 20 | 20 | 50 | $\begin{aligned} & 55 \\ & 58 \\ & \hline \end{aligned}$ | $\begin{aligned} & 56 \\ & 54 \\ & \hline \end{aligned}$ | $\begin{aligned} & 48 \\ & 48 \end{aligned}$ | 21 | 49 | $\begin{aligned} & 39 \\ & 58 \end{aligned}$ | $\begin{aligned} & \hline 19 \\ & 31 \end{aligned}$ | $\begin{aligned} & 56 \\ & 24 \end{aligned}$ | 22 | 47 | $\begin{aligned} & 58 \\ & 58 \end{aligned}$ | $\begin{array}{r} 46 \\ 6 \end{array}$ | $\begin{array}{\|l} 55 \\ 55 \\ \hline \end{array}$ | 23 | 45 | $\begin{array}{\|l} 53 \\ 57 \\ \hline \end{array}$ | $\begin{aligned} & 13 \\ & 41 \end{aligned}$ | $\begin{array}{\|l} \hline 46 \\ 23 \\ \hline \end{array}$ | 24 | 43 | $\begin{aligned} & \mathbf{2 1} \\ & 57 \end{aligned}$ | $\begin{array}{\|l} 37 \\ 14 \end{array}$ | $\begin{array}{\|r} \hline \mathbf{o} \\ 47 \end{array}$ |  |
| 21 |  | 51 | $\begin{aligned} & 54 \\ & 58 \\ & \hline \end{aligned}$ | $\begin{aligned} & \mathbf{5 1} \\ & 54 \\ & \hline \end{aligned}$ | $\begin{aligned} & 36 \\ & 26 \\ & \hline \end{aligned}$ |  | 50 | $\begin{aligned} & 37 \\ & 58 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|l} \hline \mathbf{5 1} \\ 3^{1} \\ \hline \end{array}$ | $\begin{gathered} 20 \\ 0 \end{gathered}$ |  | 48 | $\begin{aligned} & 56 \\ & 58 \end{aligned}$ | $\begin{array}{\|r} 53 \\ \hline \end{array}$ | $\begin{aligned} & 50 \\ & 30 \end{aligned}$ |  | 46 | $\begin{aligned} & 50 \\ & 57 \\ & \hline \end{aligned}$ | $\begin{aligned} & 55 \\ & 40 \end{aligned}$ | $\begin{array}{\|r} 9 \\ 56 \\ \hline \end{array}$ |  | 44 | $\begin{array}{\|l} \hline \mathbf{1 8} \\ 57 \\ \hline \end{array}$ | $\begin{array}{\|l} 51 \\ 14 \\ \hline \end{array}$ | $\begin{aligned} & 47 \\ & 20 \end{aligned}$ |  |
| 22 |  | 52 | $\begin{array}{\|l} 53 \\ 58 \\ \hline \end{array}$ | $\begin{aligned} & 4^{6} \\ & 54 \\ & \hline \end{aligned}$ | $\begin{aligned} & 2 \\ & 2 \\ & \hline \end{aligned}$ |  | 51 | $\begin{aligned} & 36 \\ & 58 \\ & \hline \end{aligned}$ | $\begin{aligned} & 22 \\ & 30 \\ & \hline \end{aligned}$ | $\begin{aligned} & 20 \\ & 36 \end{aligned}$ |  | 49 | $\begin{array}{\|} 55 \\ 58 \\ \hline \end{array}$ | $\begin{aligned} & 0 \\ & 6 \\ & \hline \end{aligned}$ | $\begin{array}{\|r} 20 \\ 5 \\ \hline \end{array}$ |  | 47 | $\begin{aligned} & 48 \\ & 57 \end{aligned}$ | $\begin{aligned} & 3^{6} \\ & 40 \\ & \hline \end{aligned}$ | $\begin{array}{r} 5 \\ 30 \\ \hline \end{array}$ |  | 45 | $\begin{array}{\|l} \hline \mathbf{1 6} \\ 57 \\ \hline \end{array}$ | $\begin{array}{\|r} \hline 6 \\ 13 \\ \hline \end{array}$ | $\begin{array}{r} 7 \\ 52 \\ \hline \end{array}$ |  |
| 23 |  | 53 | $\begin{aligned} & 52 \\ & 58 \\ & \hline \end{aligned}$ | $\begin{aligned} & 40 \\ & 53 \end{aligned}$ | $\begin{array}{r} 4 \\ 40 \\ \hline \end{array}$ |  | 52 | $\begin{aligned} & 34 \\ & 58 \\ & \hline \end{aligned}$ | $\begin{aligned} & 52 \\ & 30 \\ & \hline \end{aligned}$ | $\begin{aligned} & 56 \\ & 12 \end{aligned}$ |  | 50 | $\begin{aligned} & 53 \\ & 58 \\ & \hline \end{aligned}$ | $\begin{aligned} & \hline 6 \\ & 5 \\ & \hline \end{aligned}$ | $\begin{aligned} & 25 \\ & 40 \end{aligned}$ |  | 48 | $\begin{aligned} & 46 \\ & 57 \end{aligned}$ | $\begin{aligned} & 16 \\ & 40 \end{aligned}$ | $\begin{array}{r} 35 \\ 5 \end{array}$ |  | 46 | $\begin{array}{\|l} \hline 13 \\ 57 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 19 \\ 13 \\ \hline \end{array}$ | $\begin{aligned} & 59 \\ & 26 \end{aligned}$ |  |
| 24 |  | 54 | $\begin{array}{\|l\|l} \mathbf{5 1} \\ 58 \\ \hline \end{array}$ | $\begin{aligned} & \hline 33 \\ & 53 \\ & \hline \end{aligned}$ | $\begin{aligned} & \hline 44 \\ & 17 \\ & \hline \end{aligned}$ |  | 53 | $\begin{aligned} & 33 \\ & 58 \end{aligned}$ | $\begin{array}{\|l\|} \hline 23 \\ 29 \\ \hline \end{array}$ | $\begin{array}{\|r\|} \hline 8 \\ 47 \\ \hline \end{array}$ |  | 51 | $\begin{aligned} & \mathbf{5 1} \\ & 58 \\ & \hline \end{aligned}$ | $\begin{array}{\|r} 12 \\ 5 \\ \hline \end{array}$ | $\begin{array}{r} 5 \\ 14 \\ \hline \end{array}$ |  | 49 | $\begin{aligned} & 43 \\ & 57 \\ & \hline \end{aligned}$ | $\begin{aligned} & 5^{6} \\ & 39 \end{aligned}$ | $\begin{array}{\|l} \hline 40 \\ 38 \\ \hline \end{array}$ |  | 47 | $\begin{array}{\|l} \hline \mathbf{1 0} \\ 57 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 33 \\ 12 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{2 5} \\ & 58 \\ & \hline \end{aligned}$ |  |
| 25 |  | 55 | $\begin{aligned} & 50 \\ & 58 \\ & \hline \end{aligned}$ | $\begin{aligned} & 27 \\ & 52 \\ & \hline \end{aligned}$ | $\begin{array}{\|r\|} \hline \mathbf{1} \\ 53 \\ \hline \end{array}$ |  | 54 | $\begin{aligned} & \mathbf{3 1} \\ & 5^{8} \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 52 \\ 29 \\ \hline \end{array}$ | $\begin{aligned} & 55 \\ & 24 \end{aligned}$ |  | 52 | $\begin{aligned} & 49 \\ & 58 \\ & \hline \end{aligned}$ | $\begin{array}{r} 17 \\ \hline 4 \\ \hline \end{array}$ | $\begin{aligned} & 19 \\ & 50 \\ & \hline \end{aligned}$ |  | 50 | $\begin{array}{\|l} \mathbf{4 1} \\ \mathbf{5 7} \\ \hline \end{array}$ | $\begin{aligned} & 36 \\ & 39 \end{aligned}$ | $\begin{array}{\|l\|} \hline 18 \\ 12 \\ \hline \end{array}$ |  | 48 | $\begin{array}{\|r} \hline 7 \\ 57 \\ \hline \end{array}$ | $\begin{aligned} & 46 \\ & 12 \end{aligned}$ | $\begin{array}{\|l\|} \hline 23 \\ 31 \\ \hline \end{array}$ | 5 |
| 26 |  | 56 | $\begin{array}{\|l} 49 \\ 58 \\ \hline \end{array}$ | $\begin{aligned} & 19 \\ & 5^{2} \\ & \hline \end{aligned}$ | $\begin{aligned} & \hline 54 \\ & 31 \\ & \hline \end{aligned}$ |  | 55 | $\begin{aligned} & 30 \\ & 58 \\ & \hline \end{aligned}$ | $\begin{aligned} & 22 \\ & 29 \\ & \hline \end{aligned}$ | $\begin{array}{r} 19 \\ 0 \end{array}$ |  | 53 | $\begin{aligned} & 47 \\ & 58 \\ & \hline \end{aligned}$ | $\begin{array}{r} \hline 22 \\ \hline 4 \\ \hline \end{array}$ | $\begin{array}{r} 9 \\ 25 \\ \hline \end{array}$ |  | 51 | $\begin{array}{\|l\|} \hline 39 \\ 57 \\ \hline \end{array}$ | $\begin{aligned} & 15 \\ & 38 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 30 \\ 46 \\ \hline \end{array}$ |  | 49 | $\begin{array}{r} 4 \\ 57 \\ \hline \end{array}$ | $\begin{aligned} & 58 \\ & 12 \end{aligned}$ | $\begin{array}{r} 54 \\ \hline 4 \\ \hline \end{array}$ | 6 |
| 27 |  | 57 | $\begin{aligned} & 48 \\ & 58 \\ & \hline \end{aligned}$ | $\begin{aligned} & 12 \\ & 52 \\ & \hline \end{aligned}$ | $\begin{array}{r} 25 \\ 8 \\ \hline \end{array}$ |  | 56 | $\begin{aligned} & 28 \\ & 58 \end{aligned}$ | $\begin{array}{\|l\|l\|} \hline \mathbf{5 1} \\ \mathbf{2} 8 \\ \hline \end{array}$ | $\begin{aligned} & 19 \\ & 36 \\ & \hline \end{aligned}$ |  | 54 | $\begin{array}{r} 45 \\ 58 \\ \hline \end{array}$ | $\begin{array}{r} 26 \\ \hline \end{array}$ | $\begin{array}{\|l} \mathbf{3 4} \\ 59 \\ \hline \end{array}$ |  | 52 | $\begin{array}{\|c} 36 \\ 57 \\ \hline \end{array}$ | $\begin{aligned} & 54 \\ & 38 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 16 \\ 19 \\ \hline \end{array}$ |  | 50 | $\begin{array}{r} \mathbf{2} \\ 57 \\ \hline \end{array}$ | $\begin{aligned} & 10 \\ & \hline 10 \end{aligned}$ | $\begin{aligned} & 58 \\ & 36 \end{aligned}$ | 7 |
| 28 |  | 58 | $\begin{array}{\|l} \hline 47 \\ 58 \\ \hline \end{array}$ | $\begin{array}{r} 4 \\ 51 \\ \hline \end{array}$ | $\begin{aligned} & 33 \\ & 45 \\ & \hline \end{aligned}$ |  | 57 | $\begin{aligned} & \mathbf{2 7} \\ & 58 \end{aligned}$ | $\begin{array}{\|l\|} \hline 19 \\ \mathbf{2 8} \\ \hline \end{array}$ | $\begin{aligned} & 55 \\ & 11 \end{aligned}$ |  | 55 | $\begin{aligned} & 43 \\ & 58 \end{aligned}$ | $\begin{array}{r} 30 \\ \hline \end{array}$ | $\begin{aligned} & 33 \\ & 35 \\ & \hline \end{aligned}$ |  | 53 | $\begin{aligned} & 34 \\ & 57 \\ & \hline \end{aligned}$ | $\begin{aligned} & \mathbf{3 2}^{2} \\ & 37 \\ & \hline \end{aligned}$ | $\begin{aligned} & 35 \\ & 54 \\ & \hline \end{aligned}$ |  | 50 | $59$ | $\begin{array}{\|l\|} \hline 22 \\ 11 \\ \hline \end{array}$ | $\begin{array}{r} 34 \\ \hline 9 \end{array}$ | 8 |
| 29 |  | 59 | $\begin{aligned} & 45 \\ & 58 \\ & \hline \end{aligned}$ | $\begin{aligned} & 56 \\ & 51 \end{aligned}$ | $\begin{aligned} & \hline 18 \\ & 22 \end{aligned}$ |  | 58 | $\begin{array}{\|l} 25 \\ 58 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 48 \\ 27 \\ \hline \end{array}$ | $\begin{array}{r} 6 \\ 48 \\ \hline \end{array}$ |  | 56 | $\begin{array}{\|l} \mathbf{4 1} \\ 58 \\ \hline \end{array}$ | $\begin{array}{\|r} 34 \\ 3 \end{array}$ | $\begin{aligned} & 8 \\ & 9 \end{aligned}$ |  | 54 | $\begin{aligned} & \mathbf{3 2}^{2} \\ & 57 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 10 \\ 37 \\ \hline \end{array}$ | $\begin{array}{\|l} 29 \\ 27 \\ \hline \end{array}$ |  | 51 | $\begin{aligned} & 56 \\ & 57 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 33 \\ 10 \end{array}$ | $\begin{array}{\|l} 43 \\ 42 \\ \hline \end{array}$ |  |
| 30 | 21 | 0 | $\begin{aligned} & 44 \\ & 58 \\ & \hline \end{aligned}$ | $\begin{aligned} & 47 \\ & 50 \\ & \hline \end{aligned}$ | $\begin{aligned} & 40 \\ & 58 \\ & \hline \end{aligned}$ | 21 | 59 | $\begin{aligned} & 24 \\ & 58 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 15 \\ 27 \\ \hline \end{array}$ | $\begin{array}{\|l} 54 \\ 23 \\ \hline \end{array}$ | 22 | 57 | $\begin{array}{r} 39 \\ 58 \\ \hline \end{array}$ | $\begin{array}{\|r} 37 \\ 2 \end{array}$ | $\begin{array}{\|l} \mathbf{1 7} \\ \mathbf{4 4} \end{array}$ | 23 | 55 | $\begin{array}{\|} 29 \\ 57 \\ \hline \end{array}$ | $\begin{array}{\|l} 47 \\ 37 \\ \hline \end{array}$ | $\begin{array}{r} 56 \\ 1 \end{array}$ | 24 | 52 | $\begin{array}{\|} 53 \\ 57 \\ \hline \end{array}$ | $\begin{aligned} & 44 \\ & 10 \end{aligned}$ | $\begin{array}{\|l\|} \hline 25 \\ 15 \end{array}$ |  |

Bürgi's 1' sine table (reconstruction, D. Roegel, 2016)

| 1 | $20^{\circ}$ |  |  |  |  | $21^{\circ}$ |  |  |  |  | $22^{\circ}$ |  |  |  |  | $23^{\circ}$ |  |  |  |  | $24^{\circ}$ |  |  |  |  | , |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 30 | 21 | 0 | $\begin{aligned} & \hline 44 \\ & 58 \\ & \hline \end{aligned}$ | $\begin{aligned} & 47 \\ & 50 \\ & \hline \end{aligned}$ | $\begin{aligned} & 40 \\ & 58 \\ & \hline \end{aligned}$ | 21 | 59 | $\begin{aligned} & 24 \\ & 58 \\ & \hline \end{aligned}$ | $\begin{aligned} & 15 \\ & 27 \end{aligned}$ | $\begin{array}{\|l\|} \hline 54 \\ 23 \\ \hline \end{array}$ | 22 | 57 | $\begin{array}{\|l} \hline 39 \\ 58 \\ \hline \end{array}$ | $\begin{array}{r} 37 \\ 2 \end{array}$ | $\begin{array}{\|l\|} \hline \mathbf{1 7} \\ 44 \\ \hline \end{array}$ | 23 | 55 | $\begin{aligned} & 29 \\ & 57 \\ & \hline \end{aligned}$ | $\begin{aligned} & \mathbf{4 7} \\ & 37 \end{aligned}$ | $\begin{array}{r} 56 \\ 1 \end{array}$ | 24 | 52 | $\begin{array}{\|l} \hline 53 \\ 57 \\ \hline \end{array}$ | $\begin{aligned} & 44 \\ & 10 \end{aligned}$ | $\begin{array}{\|l\|} \hline 25 \\ 15 \\ \hline \end{array}$ | 30 |
| 31 |  | 1 | $\begin{aligned} & 43 \\ & 58 \\ & \hline \end{aligned}$ | $\begin{aligned} & 38 \\ & 50 \\ & \hline \end{aligned}$ | $\begin{aligned} & 38 \\ & 36 \\ & \hline \end{aligned}$ | 22 | 0 | $\begin{aligned} & 22 \\ & 58 \\ & \hline \end{aligned}$ | $\begin{aligned} & 43 \\ & 27 \\ & \hline \end{aligned}$ | $\begin{array}{r} 17 \\ 0 \end{array}$ |  | 58 | $\begin{aligned} & 37 \\ & 58 \\ & \hline \end{aligned}$ | $\begin{array}{r} 40 \\ 2 \end{array}$ | $\begin{array}{r} 1 \\ 19 \\ \hline \end{array}$ |  | 56 | $\begin{aligned} & \mathbf{2 7} \\ & 57 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 24 \\ 36 \end{array}$ | $\begin{array}{\|l} 57 \\ 35 \\ \hline \end{array}$ |  | 53 | $\begin{aligned} & \mathbf{5 0} \\ & 57 \\ & \hline \end{aligned}$ | $\begin{array}{r} 54 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 40 \\ 48 \\ \hline \end{array}$ | 31 |
| 32 |  | 2 | $\begin{aligned} & \hline 42 \\ & 58 \\ & \hline \end{aligned}$ | $\begin{aligned} & \hline 29 \\ & 50 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 14 \\ 13 \\ \hline \end{array}$ |  | 1 | $\begin{array}{\|l\|} \hline 21 \\ 58 \\ \hline \end{array}$ | $\begin{aligned} & 10 \\ & 26 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline \mathbf{1 7} \\ 35 \\ \hline \end{array}$ |  | 59 | $\begin{array}{\|l} 35 \\ 58 \\ \hline \end{array}$ | $\begin{array}{\|c} 42 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 20 \\ 54 \\ \hline \end{array}$ |  | 57 | $25$ | $\begin{array}{\|r} \hline 1 \\ 3^{6} \\ \hline \end{array}$ | $\begin{array}{r} 32 \\ 8 \end{array}$ |  | 54 | $\begin{array}{\|l\|} \hline 48 \\ 57 \\ \hline \end{array}$ | $\begin{aligned} & \hline 4 \\ & 9 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 28 \\ 20 \\ \hline \end{array}$ | 32 |
| 33 |  | 3 | $\begin{aligned} & 41 \\ & 58 \\ & \hline \end{aligned}$ | $\begin{array}{r} 19 \\ 49 \\ \hline \end{array}$ | $\begin{array}{\|l} \mathbf{2 7} \\ 49 \\ \hline \end{array}$ |  | 2 | $\begin{aligned} & 19 \\ & 58 \\ & \hline \end{aligned}$ | $\begin{aligned} & 36 \\ & 26 \end{aligned}$ | $\begin{aligned} & 52 \\ & 11 \end{aligned}$ | 23 | 0 | $\begin{array}{\|l} 33 \\ 58 \\ \hline \end{array}$ | $\begin{gathered} 44 \\ 1 \\ \hline \end{gathered}$ | $\begin{aligned} & 14 \\ & 28 \\ & \hline \end{aligned}$ |  | $5^{8}$ | $\begin{aligned} & 22 \\ & 57 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 37 \\ 35 \\ \hline \end{array}$ | $\begin{aligned} & 40 \\ & 42 \\ & \hline \end{aligned}$ |  | 55 | $\begin{aligned} & 45 \\ & 57 \\ & \hline \end{aligned}$ | $\begin{array}{r} 13 \\ 8 \end{array}$ | $\begin{array}{\|l} \hline 48 \\ 53 \\ \hline \end{array}$ | 33 |
| 34 |  | 4 | $\begin{aligned} & 40 \\ & 58 \\ & \hline \end{aligned}$ | $\begin{array}{r} 9 \\ 49 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline \mathbf{1 6} \\ \mathbf{2 7} \\ \hline \end{array}$ |  | 3 | $\begin{array}{\|l\|} \hline 18 \\ 58 \\ \hline \end{array}$ | $\begin{array}{\|r} 3 \\ 25 \\ \hline \end{array}$ | $\begin{array}{r} 3 \\ 47 \\ \hline \end{array}$ |  | 1 | $\begin{array}{\|l\|} \hline \mathbf{3 1} \\ 58 \\ \hline \end{array}$ | $\begin{array}{r} 45 \\ 1 \\ \hline \end{array}$ | $\begin{array}{r} 42 \\ 3 \\ \hline \end{array}$ |  | 59 | $\begin{aligned} & 20 \\ & 57 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 13 \\ 35 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 22 \\ 16 \\ \hline \end{array}$ |  | 56 | $\begin{array}{\|l} \hline \mathbf{4 2} \\ 57 \\ \hline \end{array}$ | $\begin{array}{r} 22 \\ 8 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 41 \\ \mathbf{2 5} \\ \hline \end{array}$ | 34 |
| 35 |  | 5 | $\begin{aligned} & 38 \\ & 58 \\ & 58 \end{aligned}$ | $\begin{aligned} & 58 \\ & 49 \\ & \hline \end{aligned}$ | $\begin{array}{r} 43 \\ 3 \end{array}$ |  | 4 | $\begin{aligned} & 16 \\ & 58 \end{aligned}$ | $\begin{aligned} & 28 \\ & 25 \end{aligned}$ | $\begin{aligned} & 50 \\ & 22 \end{aligned}$ |  | 2 | $\begin{aligned} & 29 \\ & 58 \end{aligned}$ | $\begin{gathered} 46 \\ 0 \end{gathered}$ | $\begin{aligned} & 45 \\ & 38 \\ & \hline \end{aligned}$ | 24 | 0 | $\begin{aligned} & \mathbf{1 7} \\ & 57 \\ & \hline \end{aligned}$ | $\begin{aligned} & 48 \\ & 34 \\ & \hline \end{aligned}$ | $\begin{aligned} & 38 \\ & 50 \\ & \hline \end{aligned}$ |  | 57 | $\begin{array}{\|l} 39 \\ 57 \\ \hline \end{array}$ | $\begin{array}{r} \mathbf{3 1} \\ 7 \end{array}$ | $\begin{array}{r} 6 \\ 58 \end{array}$ | 35 |
| 36 |  | 6 | $\begin{aligned} & 37 \\ & 58 \\ & \hline \end{aligned}$ | $\begin{aligned} & 47 \\ & 48 \end{aligned}$ | $\begin{aligned} & 46 \\ & 40 \end{aligned}$ |  | 5 | $\begin{array}{\|l\|} \hline 14 \\ 58 \end{array}$ | $\begin{array}{\|l\|} \hline 54 \\ 24 \end{array}$ | $\begin{array}{\|l} \mathbf{1 2} \\ 59 \\ \hline \end{array}$ |  | 3 | $\begin{aligned} & 27 \\ & 58 \end{aligned}$ | $\begin{array}{r} 47 \\ 0 \end{array}$ | $\begin{aligned} & 23 \\ & 12 \end{aligned}$ |  | 1 | $\begin{aligned} & 15 \\ & 57 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 23 \\ 34 \end{array}$ | $\begin{aligned} & 28 \\ & 23 \end{aligned}$ |  | 58 | $\begin{aligned} & 36 \\ & 57 \end{aligned}$ | $\begin{array}{r} 39 \\ 7 \\ \hline \end{array}$ | $\begin{array}{\|r\|} \hline 4 \\ 31 \end{array}$ | 36 |
| 37 |  | 7 | $\begin{aligned} & 36 \\ & 58 \end{aligned}$ | $\begin{aligned} & 36 \\ & 48 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 26 \\ 17 \end{array}$ |  | 6 | $\begin{aligned} & 13 \\ & 58 \\ & \hline \end{aligned}$ | $\begin{aligned} & 19 \\ & 24 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 11 \\ 34 \\ \hline \end{array}$ |  | 4 | $\begin{array}{\|} 25 \\ 57 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 47 \\ 59 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 35 \\ 48 \\ \hline \end{array}$ |  | 2 | $\begin{array}{\|l} \hline 12 \\ 57 \\ \hline \end{array}$ | $\begin{array}{\|l} \mathbf{5 7} \\ 33 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline \mathbf{5 1} \\ 57 \\ \hline \end{array}$ |  | 59 | $\begin{array}{\|l\|} \hline 33 \\ 57 \\ \hline \end{array}$ | $\begin{array}{r} 46 \\ \hline 7 \\ \hline \end{array}$ | $\begin{array}{\|r} 35 \\ \hline \end{array}$ | 37 |
| $3^{8}$ |  | 8 | $\begin{aligned} & 35 \\ & 58 \\ & \hline \end{aligned}$ | $\begin{aligned} & \hline 24 \\ & 47 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 43 \\ 54 \\ \hline \end{array}$ |  | 7 | $\begin{array}{\|l\|l\|} \hline 11 \\ 58 \\ \hline \end{array}$ | $\begin{aligned} & 43 \\ & 24 \\ & \hline \end{aligned}$ | $\begin{aligned} & \hline 45 \\ & 10 \end{aligned}$ |  | 5 | $\begin{array}{\|l} \hline 23 \\ 57 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 47 \\ 59 \\ \hline \end{array}$ | $\begin{aligned} & 23 \\ & 22 \end{aligned}$ |  | 3 | $\begin{array}{\|l} \hline \mathbf{1 0} \\ 57 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline \mathbf{3 1} \\ 33 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 48 \\ 30 \\ \hline \end{array}$ | 25 | 0 | $\begin{array}{\|l} \hline 30 \\ 57 \\ \hline \end{array}$ | $\begin{array}{r} 53 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 38 \\ 36 \\ \hline \end{array}$ | $3^{8}$ |
| 39 |  | 9 | $\begin{aligned} & 34 \\ & 58 \\ & \hline \end{aligned}$ | $\begin{aligned} & 12 \\ & 47 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 37 \\ 30 \\ \hline \end{array}$ |  | 8 | $\begin{array}{\|l} 10 \\ 58 \\ \hline \end{array}$ | $\begin{array}{r} 7 \\ 23 \\ \hline \end{array}$ | $\begin{array}{\|l} 55 \\ 45 \\ \hline \end{array}$ |  | 6 | $\begin{array}{\|l\|} \mathbf{2 1} \\ 57 \\ \hline \end{array}$ | $\begin{aligned} & 46 \\ & 58 \\ & \hline \end{aligned}$ | $\begin{aligned} & 45 \\ & 56 \\ & \hline \end{aligned}$ |  | 4 | $\begin{array}{\|r} \hline 8 \\ 57 \\ \hline \end{array}$ | $\begin{array}{r} 5 \\ 33 \\ \hline \end{array}$ | $\begin{array}{r} 18 \\ 4 \end{array}$ |  | 1 | $\begin{array}{\|l\|} \hline 28 \\ 57 \\ \hline \end{array}$ | $\begin{aligned} & \mathrm{o} \\ & 6 \end{aligned}$ | $\begin{array}{r} 14 \\ 8 \end{array}$ | 39 |
| 40 | 21 | 10 | $\begin{array}{\|l\|} \hline 33 \\ 58 \\ \hline \end{array}$ | $\begin{array}{r} \mathbf{o} \\ 47 \\ \hline \end{array}$ | $\begin{aligned} & \hline 7 \\ & 7 \\ & \hline \end{aligned}$ | 22 | 9 | $\begin{array}{\|r} \hline 8 \\ 58 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline \mathbf{3 1} \\ \mathbf{2 3} \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 40 \\ 21 \\ \hline \end{array}$ | 23 | 7 | $\begin{array}{\|l} \hline \mathbf{1 9} \\ 57 \\ \hline \end{array}$ | $\begin{aligned} & 45 \\ & 58 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline \mathbf{4 1}^{3} \\ \mathbf{y}^{2} \\ \hline \end{array}$ | 24 | 5 | $\begin{array}{\|r} \hline 5 \\ 57 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 38 \\ 32 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 22 \\ 38 \\ \hline \end{array}$ | 25 | 2 | $\begin{array}{\|l\|} \hline 25 \\ 57 \\ \hline \end{array}$ | $6$ | $\begin{array}{\|l} \hline 22 \\ 41 \\ \hline \end{array}$ | 40 |
| 41 |  | 11 | $\begin{aligned} & \hline \mathbf{3 1} \\ & 58 \\ & \hline \end{aligned}$ | $\begin{aligned} & 47 \\ & 46 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline \mathbf{1 4} \\ 45 \\ \hline \end{array}$ |  | 10 | $\begin{array}{\|r} \hline 6 \\ 58 \\ \hline \end{array}$ | $\begin{aligned} & 55 \\ & 22 \end{aligned}$ | $\begin{array}{\|r\|} \hline \mathbf{1} \\ 57 \\ \hline \end{array}$ |  | 8 | $\begin{array}{\|l} \mathbf{1 7} \\ 57 \\ \hline \end{array}$ | $\begin{aligned} & 44 \\ & 58 \\ & \hline \end{aligned}$ | $\begin{array}{r} 13 \\ \hline 6 \end{array}$ |  | 6 | $\begin{array}{\|r} \hline 3 \\ 57 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 11 \\ 32 \\ \hline \end{array}$ | $\begin{array}{r} \mathbf{0} \\ 11 \\ \hline \end{array}$ |  | 3 | $\begin{array}{\|l} \hline 22 \\ 57 \\ \hline \end{array}$ | $\begin{array}{r} 12 \\ \hline \\ \hline \end{array}$ | $\begin{array}{\|r} 3 \\ 14 \\ \hline \end{array}$ | 41 |
| 42 |  | 12 | $\begin{aligned} & 30 \\ & 58 \\ & \hline \end{aligned}$ | $\begin{array}{r} 33 \\ 46 \\ \hline \end{array}$ | $\begin{aligned} & 59 \\ & 20 \end{aligned}$ |  | 11 | $\begin{array}{r} 5 \\ 58 \\ \hline \end{array}$ | $\begin{aligned} & 17 \\ & 22 \end{aligned}$ | $\begin{array}{\|l} \hline 58 \\ 33 \\ \hline \end{array}$ |  | 9 | $\begin{array}{\|l\|} \hline 15 \\ 57 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline \mathbf{4 2} \\ 57 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 19 \\ 40 \\ \hline \end{array}$ |  | 7 | $\begin{array}{\|r} \hline \mathbf{o} \\ 57 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 43 \\ 31 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 11 \\ 45 \\ \hline \end{array}$ |  | 4 | $\begin{array}{\|l} \hline 19 \\ 57 \\ \hline \end{array}$ | $\begin{array}{r} 17 \\ \hline 4 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 17 \\ 46 \\ \hline \end{array}$ | 42 |
| 43 |  | 13 | $\begin{aligned} & 29 \\ & 58 \\ & \hline \end{aligned}$ | $\begin{aligned} & 20 \\ & 45 \end{aligned}$ | $\begin{aligned} & 19 \\ & 58 \\ & \hline \end{aligned}$ |  | 12 | $\begin{array}{\|r} 3 \\ 58 \\ \hline \end{array}$ | $\begin{aligned} & 40 \\ & 20 \end{aligned}$ | $\begin{array}{r} 31 \\ 8 \end{array}$ |  | 10 | $\begin{array}{\|l} \mathbf{1 3} \\ \mathbf{5 7} \\ \hline \end{array}$ | $\begin{array}{r} 39 \\ 57 \\ \hline \end{array}$ | $\begin{array}{\|l} 59 \\ 15 \\ \hline \end{array}$ |  | 7 | $\begin{array}{\|l} \hline 58 \\ 57 \\ \hline \end{array}$ | $\begin{array}{\|l\|} 14 \\ 31 \\ \hline \end{array}$ | $\begin{aligned} & 56 \\ & 18 \end{aligned}$ |  | 5 | $\begin{array}{\|l\|} \hline \mathbf{1 6} \\ 57 \\ \hline \end{array}$ | $\begin{array}{r} 22 \\ \hline 4 \end{array}$ | $\begin{array}{r} 3 \\ 18 \end{array}$ | 43 |
| 44 |  | 14 | $\begin{aligned} & \hline 28 \\ & 58 \\ & \hline \end{aligned}$ | $\begin{array}{r} 6 \\ 45 \\ \hline \end{array}$ | $\begin{array}{\|l} \mathbf{1 7} \\ \mathbf{3 4} \\ \hline \end{array}$ |  | 13 | $\begin{array}{r} 2 \\ 58 \\ \hline \end{array}$ | $\begin{array}{r} 2 \\ 21 \end{array}$ | $\begin{array}{\|l\|} \hline 39 \\ 44 \\ \hline \end{array}$ |  | 11 | $\begin{array}{\|l\|} \mathbf{1 1} \\ 57 \\ \hline \end{array}$ | $\begin{aligned} & 37 \\ & 56 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 14 \\ 50 \\ \hline \end{array}$ |  | 8 | $\begin{array}{\|l\|} \hline 55 \\ 57 \\ \hline \end{array}$ | $\begin{aligned} & 46 \\ & 30 \end{aligned}$ | $\begin{array}{\|l\|} \hline \mathbf{1 4} \\ 52 \\ \hline \end{array}$ |  | 6 | $\begin{array}{\|l} \hline \mathbf{1 3} \\ 57 \\ \hline \end{array}$ | $\begin{array}{r} \hline \mathbf{2 6} \\ 3 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 21 \\ 51 \\ \hline \end{array}$ | 44 |
| 45 |  | 15 | $\begin{aligned} & 26 \\ & 58 \\ & 5 \end{aligned}$ | $\begin{aligned} & \mathbf{5 1} \\ & 45 \\ & \hline \end{aligned}$ | $\left\lvert\, \begin{aligned} & 51 \\ & 11 \end{aligned}\right.$ |  | 14 | $\begin{array}{r} \mathbf{0} \\ 58 \\ \hline \end{array}$ | $24$ | $\begin{aligned} & 23 \\ & 20 \end{aligned}$ |  | 12 | $\begin{array}{r} 9 \\ 57 \\ \hline \end{array}$ | $\begin{array}{\|} 34 \\ 56 \\ \hline \end{array}$ | $\begin{array}{r} 4 \\ 24 \\ \hline \end{array}$ |  | 9 | $\begin{array}{\|} 53 \\ 57 \\ \hline \end{array}$ | $\begin{array}{\|l} 17 \\ 30 \\ \hline \end{array}$ | $\begin{array}{r} 6 \\ 25 \\ \hline \end{array}$ |  | 7 | $\begin{array}{\|l} \mathbf{1 0} \\ 57 \\ \hline \end{array}$ | $\begin{array}{r} 30 \\ 3 \end{array}$ | $\begin{array}{\|l} 12 \\ 23 \\ \hline \end{array}$ | 45 |
| 46 |  | 16 | $\begin{aligned} & 25 \\ & 58 \\ & \hline \end{aligned}$ | $\begin{aligned} & 37 \\ & 44 \\ & \hline \end{aligned}$ | $\begin{array}{r} 2 \\ 48 \\ \hline \end{array}$ |  | 14 | $\begin{aligned} & 58 \\ & 58 \\ & \hline \end{aligned}$ | $\begin{array}{l\|} \hline 45 \\ 20 \end{array}$ | $\begin{array}{\|l} \hline 43 \\ 55 \\ \hline \end{array}$ |  | 13 | $\begin{array}{r} 7 \\ 57 \\ \hline \end{array}$ | $\begin{aligned} & 30 \\ & 55 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline \mathbf{2 8} \\ 59 \\ \hline \end{array}$ |  | 10 | $\begin{aligned} & 50 \\ & 57 \end{aligned}$ | $\begin{array}{\|l} 47 \\ 29 \\ \hline \end{array}$ | $\begin{array}{\|l\|l\|} \hline \mathbf{3 1} \\ 59 \\ \hline \end{array}$ |  | 8 | $\begin{array}{r} 7 \\ 57 \\ \hline \end{array}$ | $\begin{array}{r} 33 \\ 2 \end{array}$ | $\begin{aligned} & 35 \\ & 56 \end{aligned}$ | 46 |
| 47 |  | 17 | $\begin{aligned} & 24 \\ & 58 \\ & \hline \end{aligned}$ | $\begin{aligned} & 21 \\ & 44 \end{aligned}$ | $\begin{aligned} & 50 \\ & 24 \end{aligned}$ |  | 15 | $\begin{array}{\|l} 57 \\ 58 \\ \hline \end{array}$ | $\begin{array}{r} 6 \\ 20 \end{array}$ | $\begin{array}{\|l} \hline 3^{8} \\ 31 \\ \hline \end{array}$ |  | 14 | $\begin{array}{r} 5 \\ 57 \end{array}$ | $\begin{aligned} & \mathbf{2 6} \\ & 55 \end{aligned}$ | $\begin{array}{\|l} 27 \\ 33 \\ \hline \end{array}$ |  | 11 | $\begin{array}{\|l} \hline 48 \\ 57 \\ \hline \end{array}$ | $\begin{array}{\|l} \mathbf{1 7} \\ \mathbf{2 9} \\ \hline \end{array}$ | $\begin{aligned} & 30 \\ & 32 \end{aligned}$ |  | 9 | $\begin{array}{r} 4 \\ 57 \\ \hline \end{array}$ | $\begin{array}{r} 36 \\ 2 \end{array}$ | $\begin{array}{\|l} \hline \mathbf{3 1} \\ \mathbf{2 8} \end{array}$ | 47 |
| 48 |  | 18 | $\begin{aligned} & 23 \\ & 58 \end{aligned}$ | $\begin{array}{r} 6 \\ 44 \end{array}$ | $\begin{array}{r} 14 \\ 1 \end{array}$ |  | 16 | $\begin{aligned} & 55 \\ & 58 \\ & \hline \end{aligned}$ | $\begin{aligned} & 27 \\ & 20 \end{aligned}$ | $\begin{aligned} & 9 \\ & 6 \end{aligned}$ |  | 15 | $\begin{array}{r} 3 \\ 57 \\ \hline \end{array}$ | $\begin{array}{\|} \mathbf{2 2} \\ 55 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{o} \\ & 8 \\ & \hline \end{aligned}$ |  | 12 | $\begin{aligned} & 45 \\ & 57 \end{aligned}$ | $\begin{array}{\|l} 47 \\ 29 \\ \hline \end{array}$ | $\begin{aligned} & 2 \\ & 6 \end{aligned}$ |  | 10 | $\begin{array}{\|r} \mathbf{1} \\ 57 \\ \hline \end{array}$ | $\begin{array}{r} 38 \\ 2 \end{array}$ | $\begin{array}{\|r} \hline 59 \\ 1 \end{array}$ | 48 |
| 49 |  | 19 | $\begin{aligned} & 21 \\ & 58 \\ & \hline \end{aligned}$ | $\begin{aligned} & 50 \\ & 43 \end{aligned}$ | $\begin{array}{\|l} \hline 15 \\ 37 \\ \hline \end{array}$ |  | 17 | $\begin{aligned} & 53 \\ & 58 \\ & \hline \end{aligned}$ | $\begin{aligned} & 47 \\ & 19 \end{aligned}$ | $\begin{aligned} & 15 \\ & 42 \end{aligned}$ |  | 16 | $\begin{array}{r} \mathbf{1} \\ 57 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{1 7} \\ & 54 \end{aligned}$ | $\begin{array}{r} 8 \\ 42 \\ \hline \end{array}$ |  | 13 | $\begin{array}{\|} 43 \\ 57 \\ \hline \end{array}$ | $\begin{aligned} & 16 \\ & 28 \end{aligned}$ | $\begin{array}{r} 8 \\ 39 \\ \hline \end{array}$ |  | 10 | $\begin{aligned} & 58 \\ & 57 \\ & \hline \end{aligned}$ | $\begin{array}{r} 41 \\ 1 \end{array}$ | $\begin{array}{\|r} \hline \mathbf{o} \\ 33 \end{array}$ | 49 |
| 50 | 21 | 20 | $\begin{aligned} & 20 \\ & 58 \\ & \hline \end{aligned}$ | $\begin{aligned} & 33 \\ & 43 \\ & \hline \end{aligned}$ | $\begin{aligned} & 52 \\ & 15 \\ & \hline \end{aligned}$ | 22 | 18 | $\begin{aligned} & 52 \\ & 58 \\ & \hline \end{aligned}$ | $\begin{array}{r} 6 \\ 19 \end{array}$ | $\begin{aligned} & 57 \\ & 18 \end{aligned}$ | 23 | 16 | $\begin{array}{\|l} 59 \\ 57 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline \mathbf{1 1} \\ 54 \\ \hline \end{array}$ | $\begin{aligned} & 50 \\ & 17 \end{aligned}$ | 24 | 14 | $\begin{aligned} & 40 \\ & 57 \end{aligned}$ | $\begin{array}{\|l} 44 \\ 28 \end{array}$ | $\begin{array}{\|l} 47 \\ 13 \end{array}$ | 25 | 11 | $\begin{array}{\|l} 55 \\ 57 \\ \hline \end{array}$ | $\begin{array}{r} 42 \\ 1 \end{array}$ | $\begin{array}{\|r} 33 \\ 5 \\ \hline \end{array}$ | 50 |
| 51 |  | 21 | $\begin{aligned} & 19 \\ & 58 \end{aligned}$ | $\begin{array}{r} 17 \\ 42 \\ \hline \end{array}$ | $\begin{array}{r} 7 \\ 50 \end{array}$ |  | 19 | $\begin{aligned} & 50 \\ & 58 \end{aligned}$ | $\begin{aligned} & 26 \\ & 18 \end{aligned}$ | $\begin{aligned} & 15 \\ & 52 \\ & \hline \end{aligned}$ |  | 17 | $\begin{aligned} & 57 \\ & 57 \end{aligned}$ | $\begin{array}{r} 6 \\ 53 \end{array}$ | $\begin{array}{r} 7 \\ 5^{1} \end{array}$ |  | 15 | $\begin{array}{\|l\|} \hline 38 \\ 57 \\ \hline \end{array}$ | $\begin{array}{\|l} 13 \\ 27 \end{array}$ | $\begin{array}{r} 0 \\ 46 \\ \hline \end{array}$ |  | 12 | $\begin{aligned} & 52 \\ & 57 \end{aligned}$ | $\begin{gathered} 43 \\ 0 \end{gathered}$ | $\begin{aligned} & 38 \\ & 38 \\ & \hline \end{aligned}$ | 51 |
| 52 |  | 22 | $\begin{aligned} & \mathbf{1 7} \\ & 58 \end{aligned}$ | $\begin{aligned} & 59 \\ & 42 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 57 \\ 27 \\ \hline \end{array}$ |  | 20 | $\begin{aligned} & 48 \\ & 58 \end{aligned}$ | $\begin{aligned} & 45 \\ & 18 \end{aligned}$ | $\begin{array}{r} 7 \\ 29 \\ \hline \end{array}$ |  | 18 | $\begin{array}{\|} 54 \\ 57 \\ \hline \end{array}$ | $\begin{aligned} & 59 \\ & 53 \end{aligned}$ | $\begin{aligned} & 58 \\ & 26 \end{aligned}$ |  | 16 | $35$ | $\begin{aligned} & 40 \\ & 27 \end{aligned}$ | $\begin{aligned} & 46 \\ & 19 \\ & \hline \end{aligned}$ |  | 13 | $\begin{array}{\|l} \hline 49 \\ 57 \\ \hline \end{array}$ | $\begin{gathered} 44 \\ 0 \\ \hline \end{gathered}$ | $\begin{array}{\|l} \hline 16 \\ 10 \\ \hline \end{array}$ | 52 |
| 53 |  | 23 | $\begin{aligned} & \hline \mathbf{1 6} \\ & 58 \\ & \hline \end{aligned}$ | $\begin{aligned} & 42 \\ & 42 \\ & \hline \end{aligned}$ | $\begin{array}{\|r\|} \hline 24 \\ \hline \end{array}$ |  | 21 | $\begin{array}{\|l} 47 \\ 58 \\ \hline \end{array}$ | $\begin{array}{r} 3 \\ 18 \end{array}$ | $\begin{array}{r} 36 \\ \hline 4 \\ \hline \end{array}$ |  | 19 | $\begin{array}{\|l} \hline 52 \\ 57 \\ \hline \end{array}$ | $\begin{array}{\|l} 53 \\ 53 \\ \hline \end{array}$ | $\begin{array}{r} 24 \\ 0 \end{array}$ |  | 17 | $\begin{array}{\|l} \hline 33 \\ 57 \\ \hline \end{array}$ | $\begin{array}{r} 8 \\ 26 \\ \hline \end{array}$ | $\begin{array}{r} 5 \\ 53 \\ \hline \end{array}$ |  | 14 | $\begin{array}{\|l} \hline 46 \\ 56 \\ \hline \end{array}$ | $\begin{aligned} & \hline 44 \\ & 59 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 26 \\ 42 \\ \hline \end{array}$ | 53 |
| 54 |  | 24 | $\begin{aligned} & 15 \\ & 58 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 24 \\ 41 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 28 \\ 41 \\ \hline \end{array}$ |  | 22 | $\begin{aligned} & 45 \\ & 58 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 21 \\ 17 \\ \hline \end{array}$ | $\begin{aligned} & \hline \mathbf{4 0} \\ & 39 \\ & \hline \end{aligned}$ |  | 20 | $\begin{array}{\|l} \hline 50 \\ 57 \\ \hline \end{array}$ | $\begin{aligned} & 46 \\ & 52 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 24 \\ 34 \\ \hline \end{array}$ |  | 18 | $\begin{array}{\|l} \hline 30 \\ 57 \\ \hline \end{array}$ | $\begin{aligned} & 34 \\ & 26 \end{aligned}$ | $\begin{aligned} & 58 \\ & 26 \end{aligned}$ |  | 15 | $\begin{aligned} & 43 \\ & 56 \\ & \hline \end{aligned}$ | $\begin{aligned} & \hline 44 \\ & 59 \\ & \hline \end{aligned}$ | $\begin{array}{\|r} 8 \\ 15 \\ \hline \end{array}$ | 54 |
| 55 |  | 25 | $\begin{aligned} & 14 \\ & 58 \\ & \hline \end{aligned}$ | $\begin{array}{r} 6 \\ 41 \\ \hline \end{array}$ | $\begin{array}{r} 9 \\ 16 \end{array}$ |  | 23 | $\begin{aligned} & 43 \\ & 58 \\ & \hline \end{aligned}$ | $\begin{aligned} & 39 \\ & 17 \end{aligned}$ | $\begin{aligned} & \hline 19 \\ & 15 \\ & \hline \end{aligned}$ |  | 21 | $\begin{aligned} & 48 \\ & 57 \\ & \hline \end{aligned}$ | $\begin{aligned} & 38 \\ & 5^{2} \end{aligned}$ | $\begin{array}{r} 58 \\ \hline \end{array}$ |  | 19 | $\begin{array}{\|l} \hline \mathbf{2 8} \\ 57 \\ \hline \end{array}$ | $\begin{array}{\|r} 1 \\ \mathbf{2 5} \\ \hline \end{array}$ | $\begin{array}{\|} \mathbf{2 4} \\ 59 \\ \hline \end{array}$ |  | 16 | $\begin{aligned} & 40 \\ & 56 \\ & \hline \end{aligned}$ | $\begin{aligned} & 43 \\ & 58 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 23 \\ 47 \\ \hline \end{array}$ | 55 |
| 56 |  | 26 | $\begin{aligned} & \hline 12 \\ & 58 \\ & \hline \end{aligned}$ | $\begin{aligned} & 47 \\ & 40 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 25 \\ 54 \\ \hline \end{array}$ |  | 24 | $\begin{aligned} & \mathbf{4 1} \\ & 58 \\ & \hline \end{aligned}$ | $\begin{aligned} & 56 \\ & 16 \end{aligned}$ | $\begin{aligned} & \hline \mathbf{3 4} \\ & 50 \\ & \hline \end{aligned}$ |  | 22 | $\begin{aligned} & \hline 46 \\ & 57 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 3^{1} \\ 5^{1} \\ \hline \end{array}$ | $\begin{array}{r} 7 \\ 43 \\ \hline \end{array}$ |  | 20 | $\begin{array}{\|} 25 \\ 57 \\ \hline \end{array}$ | $\begin{array}{\|l} \mathbf{2 7} \\ \mathbf{2 5} \\ \hline \end{array}$ | $\begin{array}{\|l} 23 \\ 33 \\ \hline \end{array}$ |  | 17 | $\begin{array}{\|l\|} \hline 37 \\ 56 \\ \hline \end{array}$ | $\begin{aligned} & 42 \\ & 58 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 10 \\ 19 \\ \hline \end{array}$ | 56 |
| 57 |  | 27 | $\begin{array}{\|l\|} \hline 11 \\ 58 \\ \hline \end{array}$ | $\begin{aligned} & 28 \\ & 40 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 19 \\ 30 \\ \hline \end{array}$ |  | 25 | $\begin{aligned} & 40 \\ & 58 \\ & \hline \end{aligned}$ | $\begin{aligned} & 13 \\ & 16 \end{aligned}$ | $\begin{aligned} & 24 \\ & 26 \end{aligned}$ |  | 23 | $\begin{array}{\|l\|} \hline 44 \\ 57 \\ \hline \end{array}$ | $\begin{aligned} & 22 \\ & 51 \\ & \hline \end{aligned}$ | $\begin{aligned} & 50 \\ & 18 \end{aligned}$ |  | 21 | $\begin{array}{\|l} \hline 22 \\ 57 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline \mathbf{5 2}^{2} \\ \mathbf{2 5} \\ \hline \end{array}$ | $\begin{array}{r} 56 \\ \hline 6 \end{array}$ |  | 18 | $\begin{array}{\|l\|} \hline 34 \\ 56 \\ \hline \end{array}$ | $\begin{aligned} & \hline \mathbf{4 0} \\ & 57 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 29 \\ 52 \\ \hline \end{array}$ | 57 |
| 58 |  | 28 | $\begin{aligned} & 10 \\ & 58 \end{aligned}$ | $\begin{array}{r} 8 \\ 40 \\ \hline \end{array}$ | $\begin{array}{r} 49 \\ 6 \end{array}$ |  | 26 | $\begin{aligned} & 38 \\ & 58 \\ & \hline \end{aligned}$ | $\begin{aligned} & 29 \\ & 16 \end{aligned}$ | $\begin{gathered} 50 \\ 1 \end{gathered}$ |  | 24 | $\begin{aligned} & \mathbf{4 2}^{2} \\ & 57 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 14 \\ 50 \\ \hline \end{array}$ | $\begin{array}{r} 8 \\ 51 \\ \hline \end{array}$ |  | 22 | $\begin{array}{\|l} 20 \\ 57 \\ \hline \end{array}$ | $\begin{aligned} & 18 \\ & 24 \end{aligned}$ | $\begin{array}{\|r} \mathbf{2} \\ 39 \\ \hline \end{array}$ |  | 19 | $\begin{aligned} & \hline \mathbf{3 1} \\ & 56 \\ & \hline \end{aligned}$ | $\begin{aligned} & 38 \\ & 57 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 21 \\ 23 \\ \hline \end{array}$ | 58 |
| 59 |  | 29 | $\begin{array}{r} 8 \\ 58 \end{array}$ | $\begin{aligned} & 48 \\ & 39 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 55 \\ 43 \\ \hline \end{array}$ |  | 27 | $\begin{aligned} & 36 \\ & 58 \end{aligned}$ | $\begin{aligned} & 45 \\ & 15 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \mathbf{5 1} \\ 36 \\ \hline \end{array}$ |  | 25 | $\begin{array}{\|l} \hline 40 \\ 57 \\ \hline \end{array}$ | $\begin{array}{r} 4 \\ 50 \\ \hline \end{array}$ | $\begin{array}{\|l} 59 \\ 27 \end{array}$ |  | 23 | $\begin{array}{\|l} \mathbf{1 7} \\ 57 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 42 \\ 24 \\ \hline \end{array}$ | $\begin{array}{\|l} \mathbf{4 1} \\ 13 \end{array}$ |  | 20 | $\begin{aligned} & 28 \\ & 56 \end{aligned}$ | $\begin{aligned} & 35 \\ & 56 \end{aligned}$ | $\begin{aligned} & 44 \\ & 56 \end{aligned}$ | 59 |
| 60 | 21 | 30 | $\begin{array}{r} 7 \\ 58 \\ \hline \end{array}$ | $\begin{aligned} & 28 \\ & 39 \end{aligned}$ | $\begin{aligned} & 38 \\ & 19 \\ & \hline \end{aligned}$ | 22 | 28 | $\begin{aligned} & 35 \\ & 58 \\ & \hline \end{aligned}$ | $\begin{array}{\|r} 1 \\ 15 \\ \hline \end{array}$ | $\begin{aligned} & 27 \\ & 12 \end{aligned}$ | 23 | 26 | $\begin{aligned} & 37 \\ & 57 \\ & \hline \end{aligned}$ | $\begin{aligned} & 55 \\ & 50 \\ & \hline \end{aligned}$ | $\begin{array}{r} 26 \\ 0 \end{array}$ | 24 | 24 | $\begin{array}{\|l} \mathbf{1 5} \\ 57 \\ \hline \end{array}$ | $\begin{array}{r} 6 \\ 23 \end{array}$ | $\begin{array}{\|l} 54 \\ 45 \\ \hline \end{array}$ | 25 | 21 | $\begin{aligned} & 25 \\ & 56 \\ & \hline \end{aligned}$ | $\begin{aligned} & 32 \\ & 56 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 40 \\ 28 \end{array}$ | 60 |

Bürgi's 1' sine table (reconstruction, D. Roegel, 2016)

| 1 | $25^{\circ}$ |  |  |  |  | $26^{\circ}$ |  |  |  |  | $27^{\circ}$ |  |  |  |  | $28^{\circ}$ |  |  |  |  | $29^{\circ}$ |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 0 | 25 | 21 | $\begin{array}{\|l\|} \hline 25 \\ 56 \\ \hline \end{array}$ | $\begin{array}{l\|} \hline 32 \\ 56 \\ \hline \end{array}$ | $\begin{array}{l\|} \hline \mathbf{4 0} \\ \mathbf{2 8} \end{array}$ | 26 | 18 | $\begin{array}{r} 8 \\ 56 \end{array}$ | $\begin{aligned} & 10 \\ & 28 \end{aligned}$ | $\begin{aligned} & 4 \\ & 8 \end{aligned}$ | 27 | 14 | $\begin{aligned} & \mathbf{2 1} \\ & 55 \\ & \hline \end{aligned}$ | $\begin{aligned} & \mathbf{5 6} \\ & 58 \end{aligned}$ | $\begin{aligned} & 53 \\ & 46 \end{aligned}$ | 28 | 10 | $\begin{array}{r} 5 \\ 55 \end{array}$ | $\begin{aligned} & \hline \mathbf{5 1} \\ & \mathbf{2 8} \end{aligned}$ | $\begin{array}{\|l\|} \hline 27 \\ 23 \\ \hline \end{array}$ | 29 | 5 | $\begin{aligned} & 18 \\ & 54 \end{aligned}$ | $\begin{aligned} & \mathbf{5}^{2} \\ & 56 \end{aligned}$ | $\begin{aligned} & \mathbf{4 1} \\ & 58 \\ & \hline \end{aligned}$ | 0 |
| 1 |  | 22 | $\begin{aligned} & \mathbf{2 2} \\ & 56 \end{aligned}$ | $\begin{aligned} & 29 \\ & 56 \\ & \hline \end{aligned}$ | $\begin{aligned} & \hline 8 \\ & 1 \end{aligned}$ |  | 19 | $\begin{array}{r} 4 \\ 56 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 38 \\ 27 \\ \hline \end{array}$ | $\begin{aligned} & 12 \\ & 39 \\ & \hline \end{aligned}$ |  | 15 | $\begin{array}{\|l\|} \hline \mathbf{1 7} \\ 55 \\ \hline \end{array}$ | $\begin{aligned} & 55 \\ & 58 \\ & \hline \end{aligned}$ | $\begin{aligned} & 39 \\ & 16 \end{aligned}$ |  | 11 | $\begin{array}{\|r} \mathbf{1} \\ 55 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 19 \\ 27 \\ \hline \end{array}$ | $\begin{aligned} & 50 \\ & 52 \\ & \hline \end{aligned}$ |  | 6 | $\begin{aligned} & 13 \\ & 54 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 49 \\ 56 \\ \hline \end{array}$ | $\begin{array}{\|l} 39 \\ 27 \\ \hline \end{array}$ | 1 |
| 2 |  | 23 | $\begin{array}{\|l\|} \hline 19 \\ 56 \\ \hline \end{array}$ | $\begin{aligned} & 25 \\ & 55 \\ & \hline \end{aligned}$ | $\begin{array}{r} 9 \\ 3^{2} \\ \hline \end{array}$ |  | 20 | $\begin{array}{r} 1 \\ 56 \\ \hline \end{array}$ | $\begin{array}{r} 5 \\ 27 \\ \hline \end{array}$ | $\begin{aligned} & 51 \\ & 10 \end{aligned}$ |  | 16 | $\begin{array}{\|l\|} \hline 13 \\ 55 \\ \hline \end{array}$ | $\begin{array}{\|l} 53 \\ 57 \\ \hline \end{array}$ | $\begin{array}{\|l} 55 \\ 46 \\ \hline \end{array}$ |  | 11 | $\begin{aligned} & 56 \\ & 55 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 47 \\ 27 \\ \hline \end{array}$ | $\begin{aligned} & 42 \\ & 20 \end{aligned}$ |  | 7 | $\begin{array}{r} 8 \\ 54 \\ \hline \end{array}$ | $\begin{aligned} & 46 \\ & 55 \\ & \hline \end{aligned}$ | $\begin{array}{\|r} \hline 6 \\ 54 \\ \hline \end{array}$ |  |
| 3 |  | 24 | $\begin{array}{\|l\|} \hline 16 \\ 56 \\ \hline \end{array}$ | $\begin{aligned} & 20 \\ & 55 \\ & \hline \end{aligned}$ | $\begin{array}{r} 41 \\ 5 \\ \hline \end{array}$ |  | 20 | $\begin{aligned} & 57 \\ & 56 \\ & \hline \end{aligned}$ | $\begin{aligned} & 33 \\ & 26 \\ & \hline \end{aligned}$ | $\begin{array}{r} 1 \\ 42 \\ \hline \end{array}$ |  | 17 | $\begin{array}{\|r} \mathbf{9} \\ 55 \\ \hline \end{array}$ | $\begin{array}{\|l} \mathbf{5 1} \\ 57 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{4 1} \\ & \mathbf{1 6} \end{aligned}$ |  | 12 | $\begin{array}{\|l} \mathbf{5 2} \\ 55 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 15 \\ 26 \\ \hline \end{array}$ | $\begin{array}{r} 2 \\ 50 \\ \hline \end{array}$ |  | 8 | $\begin{array}{r} 3 \\ 54 \\ \hline \end{array}$ | $\begin{aligned} & 4^{2} \\ & 55 \\ & \hline \end{aligned}$ | $\begin{array}{\|r} \hline \mathbf{0} \\ 23 \\ \hline \end{array}$ | 3 |
| 4 |  | 25 | $\begin{array}{\|l} 13 \\ 56 \\ \hline \end{array}$ | $\begin{aligned} & 15 \\ & 54 \\ & \hline \end{aligned}$ | $\begin{aligned} & 46 \\ & 36 \\ & \hline \end{aligned}$ |  | 21 | $\begin{array}{\|l} 53 \\ 56 \\ \hline \end{array}$ | $\begin{aligned} & 59 \\ & 26 \end{aligned}$ | $\begin{aligned} & 43 \\ & 12 \end{aligned}$ |  | 18 | $\begin{array}{r} 5 \\ 55 \\ \hline \end{array}$ | $\begin{aligned} & 48 \\ & 56 \\ & \hline \end{aligned}$ | $\begin{aligned} & 57 \\ & 46 \\ & \hline \end{aligned}$ |  | 13 | $\begin{array}{\|l} 47 \\ 55 \\ \hline \end{array}$ | $\begin{aligned} & 41 \\ & 26 \end{aligned}$ | $\begin{aligned} & 5^{2} \\ & 19 \\ & \hline \end{aligned}$ |  | 8 | $\begin{aligned} & 58 \\ & 54 \\ & \hline \end{aligned}$ | $\begin{array}{r} 37 \\ 54 \\ \hline \end{array}$ | $\begin{array}{\|l} 23 \\ 50 \\ \hline \end{array}$ | 4 |
| 5 |  | 26 | $\begin{aligned} & 10 \\ & 56 \\ & \hline \end{aligned}$ | $\begin{aligned} & 10 \\ & 54 \end{aligned}$ | $\begin{array}{r} 22 \\ 9 \end{array}$ |  | 22 | $\begin{aligned} & 50 \\ & 56 \end{aligned}$ | $\begin{aligned} & 25 \\ & 25 \\ & \hline \end{aligned}$ | $\begin{aligned} & 55 \\ & 43 \\ & \hline \end{aligned}$ |  | 19 | $55$ | $\begin{aligned} & 45 \\ & 56 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 43 \\ 17 \\ \hline \end{array}$ |  | 14 | $\begin{aligned} & 43 \\ & 55 \\ & \hline \end{aligned}$ | $\begin{array}{\|r} \hline 8 \\ 25 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 11 \\ 48 \\ \hline \end{array}$ |  | 9 | $\begin{array}{\|l} 53 \\ 54 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{3 2} \\ & 54 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 13 \\ 19 \\ \hline \end{array}$ | 5 |
| 6 |  | 27 | $\begin{array}{r} 7 \\ 56 \\ \hline \end{array}$ | $\begin{array}{r} 4 \\ 53 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 31 \\ 41 \\ \hline \end{array}$ |  | 23 | $\begin{aligned} & 46 \\ & 56 \end{aligned}$ | $\begin{array}{\|l} \mathbf{5 1} \\ \mathbf{2 5} \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 38 \\ 15 \\ \hline \end{array}$ |  | 19 | $\begin{array}{\|l} 57 \\ 55 \\ \hline \end{array}$ | $\begin{array}{\|l} \mathbf{4 2} \\ 55 \\ \hline \end{array}$ | $\begin{array}{r} \mathbf{o} \\ 46 \\ \hline \end{array}$ |  | 15 | $\begin{aligned} & 38 \\ & 55 \end{aligned}$ | $\begin{aligned} & 33 \\ & 25 \end{aligned}$ | $\begin{array}{\|l} 59 \\ 17 \end{array}$ |  | 10 | $\begin{aligned} & 48 \\ & 54 \end{aligned}$ | $\begin{aligned} & 26 \\ & 53 \end{aligned}$ | $\begin{aligned} & 32 \\ & 4^{2} \end{aligned}$ | 6 |
| 7 |  | 28 | $\begin{array}{\|r\|} \hline 3 \\ 56 \\ \hline \end{array}$ | $\begin{aligned} & 58 \\ & 53 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 12 \\ 13 \\ \hline \end{array}$ |  | 24 | $\begin{aligned} & 43 \\ & 56 \\ & \hline \end{aligned}$ | $\begin{aligned} & 16 \\ & 24 \\ & \hline \end{aligned}$ | $\begin{aligned} & 53 \\ & 46 \end{aligned}$ |  | 20 | $\begin{array}{\|l} 53 \\ 55 \\ \hline \end{array}$ | $\begin{array}{\|l} \mathbf{3 7} \\ 55 \\ \hline \end{array}$ | $\begin{aligned} & 46 \\ & 17 \end{aligned}$ |  | 16 | $\begin{aligned} & 33 \\ & 55 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 59 \\ 24 \\ \hline \end{array}$ | $\begin{aligned} & 16 \\ & 46 \end{aligned}$ |  | 11 | $\begin{array}{\|l} 43 \\ 54 \\ \hline \end{array}$ | $\begin{aligned} & 20 \\ & 53 \end{aligned}$ | $\begin{aligned} & 18 \\ & 15 \end{aligned}$ | 7 |
| 8 |  | 29 | $\begin{array}{\|r\|} \hline \mathbf{0} \\ 56 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{5 1} \\ & 52 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 25 \\ 45 \\ \hline \end{array}$ |  | 25 | $\begin{aligned} & 39 \\ & 56 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 41 \\ 24 \\ \hline \end{array}$ | $\begin{aligned} & 39 \\ & 16 \\ & \hline \end{aligned}$ |  | 21 | $\begin{array}{\|l} 49 \\ 55 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 33 \\ 54 \\ \hline \end{array}$ | $\begin{array}{r} 3 \\ 46 \\ \hline \end{array}$ |  | 17 | $\begin{aligned} & 29 \\ & 55 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 24 \\ 24 \\ \hline \end{array}$ | $\begin{array}{\|r} \hline 2 \\ 14 \\ \hline \end{array}$ |  | 12 | $\begin{aligned} & 38 \\ & 54 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 13 \\ 5^{2} \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 33 \\ 43 \\ \hline \end{array}$ | 8 |
| 9 |  | 29 | $\begin{array}{\|l\|} 57 \\ 56 \\ \hline \end{array}$ | $\begin{aligned} & 44 \\ & 52 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|l} \hline \mathbf{1 0} \\ \mathbf{1 7} \\ \hline \end{array}$ |  | 26 | $\begin{aligned} & 36 \\ & 56 \end{aligned}$ | $\begin{array}{r} 5 \\ 23 \\ \hline \end{array}$ | $\begin{aligned} & 55 \\ & 48 \\ & \hline \end{aligned}$ |  | 22 | $\begin{array}{\|l} 45 \\ 55 \end{array}$ | $\begin{array}{\|} \mathbf{2 7} \\ 54 \\ \hline \end{array}$ | $\begin{aligned} & 49 \\ & 16 \end{aligned}$ |  | 18 | $\begin{array}{\|} 24 \\ 55 \\ \hline \end{array}$ | $\begin{aligned} & 48 \\ & 23 \end{aligned}$ | $\begin{aligned} & \hline \mathbf{1 6} \\ & 44 \end{aligned}$ |  | 13 | $\begin{array}{\|l} 33 \\ 54 \\ \hline \end{array}$ | $\begin{array}{r} 6 \\ 52 \end{array}$ | $\begin{aligned} & \hline 16 \\ & 10 \end{aligned}$ | 9 |
| 10 | 25 | 30 | $\begin{array}{\|l} 54 \\ 56 \\ \hline \end{array}$ | $\begin{aligned} & 36 \\ & 51 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 27 \\ 49 \\ \hline \end{array}$ | 26 | 27 | $\begin{aligned} & 32 \\ & 56 \end{aligned}$ | $\begin{aligned} & 29 \\ & 23 \end{aligned}$ | $\begin{aligned} & 43 \\ & 19 \end{aligned}$ | 27 | 23 | $\begin{aligned} & \mathbf{4 1} \\ & 55 \\ & \hline \end{aligned}$ | $\begin{aligned} & \mathbf{2 2} \\ & 53 \\ & \hline \end{aligned}$ | $\begin{array}{r} 5 \\ 47 \\ \hline \end{array}$ | 28 | 19 | $\begin{aligned} & 20 \\ & 55 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 12 \\ 23 \\ \hline \end{array}$ | $\begin{array}{r} \mathbf{0} \\ 13 \\ \hline \end{array}$ | 29 | 14 | $\begin{array}{\|} \mathbf{2 7} \\ 54 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 58 \\ 51 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{2 6} \\ & 39 \end{aligned}$ | 0 |
| 11 |  | 31 | $\begin{array}{\|l\|} \hline \mathbf{5 1} \\ 56 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 28 \\ 51 \end{array}$ | $\begin{array}{\|l\|} \hline 16 \\ 21 \\ \hline \end{array}$ |  | 28 | $\begin{aligned} & 28 \\ & 56 \end{aligned}$ | $\begin{array}{\|l\|} \hline 53 \\ 22 \end{array}$ | $\begin{array}{r} \hline \mathbf{2} \\ 49 \\ \hline \end{array}$ |  | 24 | $\begin{array}{\|l} \hline 37 \\ 55 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 15 \\ 53 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{5 2}^{2} \\ & 16 \end{aligned}$ |  | 20 | $\begin{aligned} & 15 \\ & 55 \\ & \hline \end{aligned}$ | $\begin{aligned} & 35 \\ & 22 \end{aligned}$ | $\begin{array}{\|l} \hline 13 \\ 42 \\ \hline \end{array}$ |  | 15 | $\begin{aligned} & 22 \\ & 54 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 50 \\ 51 \\ \hline \end{array}$ | $\begin{aligned} & 5 \\ & 6 \end{aligned}$ |  |
| 12 |  | 32 | $\begin{array}{\|l\|} \hline 48 \\ 56 \\ \hline \end{array}$ | $\begin{aligned} & 19 \\ & 50 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 37 \\ 53 \\ \hline \end{array}$ |  | 29 | $\begin{aligned} & 25 \\ & 56 \end{aligned}$ | $\begin{array}{l\|} \hline 15 \\ 22 \end{array}$ | $\begin{aligned} & 51 \\ & 21 \end{aligned}$ |  | 25 | $\begin{array}{\|l\|} \hline 33 \\ 55 \\ \hline \end{array}$ | $\begin{array}{r} 9 \\ 5^{2} \\ \hline \end{array}$ | $\begin{array}{\|r} 8 \\ 4^{6} \\ \hline \end{array}$ |  | 21 | $\begin{aligned} & 10 \\ & 55 \\ & \hline \end{aligned}$ | $\begin{aligned} & 57 \\ & 22 \end{aligned}$ | $\begin{array}{\|l\|} \hline 55 \\ 10 \\ \hline \end{array}$ |  | 16 | $\begin{aligned} & \mathbf{1 7} \\ & 54 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline \mathbf{4 1} \\ 50 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline \mathbf{1 1} \\ 34 \\ \hline \end{array}$ |  |
| 13 |  | 33 | $\begin{aligned} & 45 \\ & 56 \\ & \hline \end{aligned}$ | $\begin{aligned} & 10 \\ & 50 \\ & \hline \end{aligned}$ | $\begin{aligned} & 30 \\ & 25 \\ & \hline \end{aligned}$ |  | 30 | $\begin{aligned} & 21 \\ & 56 \end{aligned}$ | $\begin{aligned} & 38 \\ & 21 \end{aligned}$ | $\begin{array}{\|l} 12 \\ 51 \\ \hline \end{array}$ |  | 26 | $\begin{aligned} & 29 \\ & 55 \\ & \hline \end{aligned}$ | $\begin{array}{\|r} 1 \\ 5^{2} \\ \hline \end{array}$ | $\begin{array}{\|l} 54 \\ 16 \end{array}$ |  | 22 | $\begin{array}{r} 6 \\ 55 \\ \hline \end{array}$ | $\begin{aligned} & 20 \\ & 21 \end{aligned}$ | $\begin{array}{r} 5 \\ 40 \\ \hline \end{array}$ |  | 17 | $\begin{aligned} & 12 \\ & 54 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline \mathbf{3 1} \\ 50 \\ \hline \end{array}$ | $\begin{array}{r} 45 \\ 2 \end{array}$ |  |
| 14 |  | 34 | $\begin{aligned} & 42 \\ & 56 \\ & \hline \end{aligned}$ | $\begin{array}{r} \mathbf{0} \\ 49 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 55 \\ 57 \\ \hline \end{array}$ |  | 31 | $\begin{aligned} & 18 \\ & 56 \end{aligned}$ | $\begin{array}{r} 0 \\ 21 \\ \hline \end{array}$ | $\begin{array}{r} 3 \\ 23 \\ \hline \end{array}$ |  | 27 | $\begin{array}{\|} 24 \\ 55 \\ \hline \end{array}$ | $\begin{array}{\|l} 54 \\ 51 \\ \hline \end{array}$ | $\begin{aligned} & 10 \\ & 46 \end{aligned}$ |  | 23 | $\begin{array}{\|r} \mathbf{1} \\ 55 \\ \hline \end{array}$ | $\begin{aligned} & \hline \mathbf{4 1} \\ & 21 \end{aligned}$ | $\begin{array}{r} 45 \\ 8 \end{array}$ |  | 18 | $\begin{array}{r} 7 \\ 54 \\ \hline \end{array}$ | $\begin{array}{\|l} \mathbf{2 1} \\ 49 \\ \hline \end{array}$ | $\begin{array}{\|l} 47 \\ 30 \\ \hline \end{array}$ |  |
| 15 |  | 35 | $\begin{array}{\|l\|} \hline 38 \\ 56 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{5 0} \\ & 49 \\ & \hline \end{aligned}$ | $\begin{aligned} & 52 \\ & 29 \end{aligned}$ |  | 32 | $\begin{aligned} & 14 \\ & 56 \\ & \hline \end{aligned}$ | $\begin{aligned} & 21 \\ & 20 \end{aligned}$ | $\begin{array}{\|l\|} \hline 26 \\ 53 \\ \hline \end{array}$ |  | 28 | $\begin{array}{\|l} 20 \\ 55 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 45 \\ 51 \\ \hline \end{array}$ | $\begin{aligned} & 56 \\ & 16 \end{aligned}$ |  | 23 | $\begin{array}{\|l} 57 \\ 55 \\ \hline \end{array}$ | $\begin{array}{r} 2 \\ 20 \\ \hline \end{array}$ | $\begin{aligned} & 53 \\ & 37 \\ & \hline \end{aligned}$ |  | 19 | $\begin{array}{r} \mathbf{2} \\ 54 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 11 \\ 48 \\ \hline \end{array}$ | $\begin{array}{\|l} \mathbf{1 7} \\ 58 \\ \hline \end{array}$ |  |
| 16 |  | 36 | $\begin{array}{\|l\|} \hline 35 \\ 56 \\ \hline \end{array}$ | $\begin{aligned} & \hline 40 \\ & 49 \end{aligned}$ | $\begin{array}{r} 21 \\ 1 \end{array}$ |  | 33 | $\begin{aligned} & 10 \\ & 56 \end{aligned}$ | $\begin{aligned} & 42 \\ & 20 \end{aligned}$ | $\begin{array}{\|l} \hline 19 \\ 24 \\ \hline \end{array}$ |  | 29 | $\begin{aligned} & \hline \mathbf{1 6} \\ & 55 \end{aligned}$ | $\begin{array}{\|l} \mathbf{3 7} \\ 50 \\ \hline \end{array}$ | $\begin{aligned} & 12 \\ & 46 \end{aligned}$ |  | 24 | $\begin{aligned} & \mathbf{5 2} \\ & 55 \\ & \hline \end{aligned}$ | $\begin{aligned} & 23 \\ & 20 \end{aligned}$ | $\begin{array}{r} 30 \\ 6 \end{array}$ |  | 19 | $\begin{aligned} & 57 \\ & 54 \\ & \hline \end{aligned}$ | $\begin{array}{r\|r} \hline \mathbf{o} \\ 48 \\ \hline \end{array}$ | $\begin{aligned} & 15 \\ & 26 \end{aligned}$ |  |
| 17 |  | 37 | $\begin{array}{\|l\|} \hline \mathbf{3 2} \\ 56 \\ \hline \end{array}$ | $\begin{aligned} & 29 \\ & 48 \\ & \hline \end{aligned}$ | $\begin{aligned} & \mathbf{2 2} \\ & 33 \\ & \hline \end{aligned}$ |  | 34 | $\begin{array}{r} 7 \\ 56 \\ \hline \end{array}$ | $\begin{array}{\|r} \hline 2 \\ 19 \\ \hline \end{array}$ | $\begin{array}{\|l} 43 \\ 55 \\ \hline \end{array}$ |  | 30 | $\begin{array}{\|l\|} 12 \\ 55 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 27 \\ 50 \\ \hline \end{array}$ | $\begin{aligned} & 58 \\ & 16 \\ & \hline \end{aligned}$ |  | 25 | $\begin{aligned} & 47 \\ & 55 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 43 \\ 19 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 36 \\ 35 \\ \hline \end{array}$ |  | 20 | $\begin{aligned} & \mathbf{5 1} \\ & 54 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 48 \\ 47 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline \mathbf{4 1} \\ 53 \\ \hline \end{array}$ |  |
| 18 |  | 38 | $\begin{array}{\|l\|} \hline 29 \\ 56 \end{array}$ | $\begin{aligned} & 17 \\ & 48 \end{aligned}$ | $\begin{array}{r} 55 \\ 4 \end{array}$ |  | 35 | $\begin{array}{r} 3 \\ 56 \end{array}$ | $\begin{array}{\|l} 22 \\ 19 \\ \hline \end{array}$ | $\begin{aligned} & 38 \\ & 26 \end{aligned}$ |  | 31 | $\begin{array}{r} 8 \\ 55 \end{array}$ | $\begin{array}{\|l\|} \hline \mathbf{1 8} \\ 49 \\ \hline \end{array}$ | $\begin{array}{\|l} \mathbf{1 4} \\ \mathbf{4 5} \\ \hline \end{array}$ |  | 26 | $\begin{aligned} & 43 \\ & 55 \\ & \hline \end{aligned}$ | $\begin{array}{r} 3 \\ 19 \end{array}$ | $\begin{array}{r} 11 \\ \hline \end{array}$ |  | 21 | $\begin{aligned} & 46 \\ & 54 \end{aligned}$ | $\begin{aligned} & 36 \\ & 47 \end{aligned}$ | $34$ |  |
| 19 |  | 39 | $\begin{array}{\|l\|} \hline 26 \\ 56 \\ \hline \end{array}$ | $\begin{array}{r} 5 \\ 47 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 59 \\ 37 \\ \hline \end{array}$ |  | 35 | $\begin{aligned} & 59 \\ & 56 \\ & \hline \end{aligned}$ | $\begin{aligned} & 42 \\ & 18 \end{aligned}$ | $\begin{array}{\|r} 4 \\ 57 \\ \hline \end{array}$ |  | 32 | $\begin{array}{r} 4 \\ 55 \\ \hline \end{array}$ | $\begin{array}{r} 77 \\ 49 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 59 \\ 15 \\ \hline \end{array}$ |  | 27 | $\begin{aligned} & 38 \\ & 55 \end{aligned}$ | $\begin{aligned} & 22 \\ & 18 \end{aligned}$ | $\begin{array}{\|l\|} \hline 15 \\ 33 \\ \hline \end{array}$ |  | 2 | $\begin{aligned} & \mathbf{4 1} \\ & 54 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 23 \\ 46 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 56 \\ 49 \\ \hline \end{array}$ |  |
| 20 | 25 | 40 | $\begin{array}{\|l\|} \hline 22 \\ 56 \\ \hline \end{array}$ | $\begin{aligned} & 53 \\ & 47 \end{aligned}$ | $\begin{array}{r} 36 \\ 8 \end{array}$ | 26 | 36 | $\begin{aligned} & 56 \\ & 56 \end{aligned}$ | $\begin{array}{r} \mathbf{1} \\ 18 \end{array}$ | $\begin{array}{r} \mathbf{1} \\ \mathbf{2 7} \\ \hline \end{array}$ | 27 | 32 | $\begin{array}{\|l} 59 \\ 55 \end{array}$ | $\begin{array}{\|l} 57 \\ 48 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline \mathbf{1 4} \\ 45 \end{array}$ | 28 | 28 | $\begin{aligned} & 33 \\ & 55 \\ & \hline \end{aligned}$ | $\begin{aligned} & 40 \\ & 18 \end{aligned}$ | $\begin{array}{r} 48 \\ 1 \end{array}$ | 29 | 23 | $\begin{aligned} & 3^{6} \\ & 54 \end{aligned}$ | $\begin{aligned} & 10 \\ & 46 \end{aligned}$ | $\begin{array}{\|l} \hline 45 \\ 17 \end{array}$ |  |
| 21 |  | 41 | $\begin{array}{\|l\|} \hline 19 \\ 56 \\ \hline \end{array}$ | $\begin{aligned} & 40 \\ & 46 \end{aligned}$ | $\begin{aligned} & 44 \\ & 40 \\ & \hline \end{aligned}$ |  | 37 | $\begin{aligned} & 52 \\ & 56 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 19 \\ 17 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 28 \\ 58 \\ \hline \end{array}$ |  | 33 | $\begin{array}{\|l} 55 \\ 55 \\ \hline \end{array}$ | $\begin{aligned} & 45 \\ & 48 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 59 \\ 15 \\ \hline \end{array}$ |  | 29 | $\begin{aligned} & 28 \\ & 55 \end{aligned}$ | $\begin{array}{\|l\|} \hline 58 \\ 17 \\ \hline \end{array}$ | $\begin{array}{\|l} 49 \\ 30 \\ \hline \end{array}$ |  | 24 | $\begin{aligned} & 30 \\ & 54 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 57 \\ 45 \\ \hline \end{array}$ | $\begin{array}{\|r} \mathbf{2} \\ 44 \\ \hline \end{array}$ |  |
| 22 |  | 42 | $\begin{array}{\|l\|} \hline 16 \\ 56 \\ \hline \end{array}$ | $\begin{aligned} & \hline 27 \\ & 46 \end{aligned}$ | $\begin{aligned} & 24 \\ & 12 \end{aligned}$ |  | $3^{8}$ | $\begin{aligned} & 48 \\ & 56 \end{aligned}$ | $\begin{aligned} & 37 \\ & 17 \\ & \hline \end{aligned}$ | $\begin{aligned} & 26 \\ & 29 \\ & \hline \end{aligned}$ |  | 34 | $\begin{array}{\|l} \hline \mathbf{5 1} \\ 55 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline \mathbf{3 4} \\ 47 \\ \hline \end{array}$ | $\begin{array}{\|l} \mathbf{1 4} \\ \mathbf{4 4} \\ \hline \end{array}$ |  | 30 | $\begin{aligned} & 24 \\ & 55 \\ & \hline \end{aligned}$ | $\begin{aligned} & 16 \\ & 16 \end{aligned}$ | $\begin{array}{\|l} \hline \mathbf{1 9} \\ 59 \\ \hline \end{array}$ |  | 25 | $\begin{array}{\|} 25 \\ 54 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline \mathbf{4 2} \\ 45 \\ \hline \end{array}$ | $\begin{aligned} & 46 \\ & 13 \end{aligned}$ |  |
| 23 |  | 43 | $\begin{array}{\|l\|} \hline 13 \\ 56 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 13 \\ 45 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 36 \\ 44 \\ \hline \end{array}$ |  | 39 | $\begin{aligned} & 44 \\ & 56 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 54 \\ 17 \\ \hline \end{array}$ | $\begin{gathered} 55 \\ 0 \end{gathered}$ |  | 35 | $\begin{array}{\|l} \hline 47 \\ 55 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline \mathbf{2 1} \\ 47 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 58 \\ 15 \\ \hline \end{array}$ |  | 31 | $\begin{aligned} & 19 \\ & 55 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 33 \\ 16 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 18 \\ 27 \\ \hline \end{array}$ |  | 26 | $\begin{aligned} & 20 \\ & 54 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 27 \\ 44 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 59 \\ 40 \\ \hline \end{array}$ |  |
| 24 |  | 44 | $\begin{array}{\|r\|} \hline 9 \\ 56 \\ \hline \end{array}$ | $\begin{aligned} & 59 \\ & 45 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 20 \\ 15 \\ \hline \end{array}$ |  | 40 | $\begin{aligned} & \mathbf{4 1} \\ & 56 \\ & \hline \end{aligned}$ | $\begin{aligned} & \hline 11 \\ & 16 \end{aligned}$ | $\begin{aligned} & 55 \\ & 31 \\ & \hline \end{aligned}$ |  | 36 | $43$ | $\begin{array}{r} 9 \\ 4^{6} \\ \hline \end{array}$ | $\begin{array}{\|l} 13 \\ 44 \\ \hline \end{array}$ |  | 32 | $\begin{array}{\|l\|} \mathbf{1 4} \\ 55 \\ \hline \end{array}$ | $\begin{array}{\|l} 49 \\ 15 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 45 \\ 56 \\ \hline \end{array}$ |  | 27 | $\begin{aligned} & 15 \\ & 54 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} 12 \\ 44 \\ \hline \end{array}$ | $\begin{array}{r} 39 \\ 8 \end{array}$ |  |
| 25 |  | 45 | $\begin{array}{\|r\|} \hline 6 \\ 56 \\ \hline \end{array}$ | $\begin{aligned} & \hline 44 \\ & 44 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 35 \\ 48 \\ \hline \end{array}$ |  | 41 | $\begin{aligned} & 37 \\ & 56 \\ & \hline \end{aligned}$ | $\begin{aligned} & 28 \\ & 16 \end{aligned}$ | $\begin{array}{r} 26 \\ 1 \end{array}$ |  | 37 | $\begin{array}{\|l} \hline 38 \\ 55 \\ \hline \end{array}$ | $\begin{aligned} & 55 \\ & 46 \end{aligned}$ | $\begin{array}{\|l} 57 \\ 13 \\ \hline \end{array}$ |  | 33 | $\begin{aligned} & 10 \\ & 55 \\ & \hline \end{aligned}$ | $\begin{array}{\|r} \hline 5 \\ 15 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline \mathbf{4 1} \\ \mathbf{2 5} \\ \hline \end{array}$ |  | 28 | $\begin{array}{r} 9 \\ 54 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 56 \\ 43 \\ \hline \end{array}$ | $\begin{aligned} & 47 \\ & 35 \\ & \hline \end{aligned}$ |  |
| 26 |  | 46 | $\begin{array}{\|r\|} \hline 3 \\ 56 \\ \hline \end{array}$ | $\begin{aligned} & 29 \\ & 44 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 23 \\ 19 \\ \hline \end{array}$ |  | 42 | $\begin{aligned} & 33 \\ & 56 \\ & \hline \end{aligned}$ | $\begin{aligned} & 44 \\ & 15 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 27 \\ 32 \\ \hline \end{array}$ |  | $3^{8}$ | $\begin{array}{\|l} \mathbf{3 4} \\ 55 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline \mathbf{4 2} \\ 45 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 10 \\ 44 \\ \hline \end{array}$ |  | 34 | $\begin{array}{r} 5 \\ 55 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 21 \\ 14 \\ \hline \end{array}$ | $\begin{array}{\|r} \hline 6 \\ 54 \\ \hline \end{array}$ |  | 29 | $\begin{array}{r} 4 \\ 54 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline \mathbf{4 0} \\ 43 \\ \hline \end{array}$ | $\begin{array}{\|r} 22 \\ 3 \\ \hline \end{array}$ |  |
| 27 |  | 47 | $\begin{array}{\|r\|} \hline \mathbf{0} \\ 56 \\ \hline \end{array}$ | $\begin{aligned} & \hline 13 \\ & 43 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 4^{2} \\ 50 \\ \hline \end{array}$ |  | 43 | $\begin{aligned} & 29 \\ & 56 \\ & \hline \end{aligned}$ | $\begin{aligned} & 59 \\ & 15 \\ & \hline \end{aligned}$ | $\begin{array}{\|r} 59 \\ 3 \\ \hline \end{array}$ |  | 39 | $\begin{array}{\|l} \hline \mathbf{3 0} \\ 55 \\ \hline \end{array}$ | $\begin{array}{\|l} \mathbf{2 7} \\ 45 \\ \hline \end{array}$ | $\begin{array}{\|l} 54 \\ 13 \\ \hline \end{array}$ |  | 35 | $\begin{array}{\|r} \hline 0 \\ 55 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 36 \\ 14 \\ \hline \end{array}$ | $\begin{array}{r} 0 \\ 22 \end{array}$ |  | 29 | $\begin{array}{\|} 59 \\ 54 \\ \hline \end{array}$ | $\begin{array}{\|l} 23 \\ 4^{2} \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 25 \\ 31 \\ \hline \end{array}$ | 7 |
| 28 |  | 47 | $\begin{array}{\|l\|} \hline 56 \\ 56 \\ \hline \end{array}$ | $\begin{aligned} & \hline 57 \\ & 43 \\ & \hline \end{aligned}$ | $\begin{aligned} & 32 \\ & 23 \end{aligned}$ |  | 44 | $\begin{aligned} & 26 \\ & 56 \end{aligned}$ | $\begin{aligned} & 15 \\ & 14 \\ & \hline \end{aligned}$ | $\begin{array}{r} \hline 2 \\ 33 \\ \hline \end{array}$ |  | 40 | $\begin{aligned} & \mathbf{2 6} \\ & 55 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 13 \\ 44 \\ \hline \end{array}$ | $\begin{array}{r} 7 \\ 42 \\ \hline \end{array}$ |  | 35 | $\begin{aligned} & 55 \\ & 55 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 50 \\ 13 \\ \hline \end{array}$ | $\begin{aligned} & 22 \\ & 51 \\ & \hline \end{aligned}$ |  | 30 | $\begin{array}{r} 54 \\ 54 \\ \hline \end{array}$ | $\begin{array}{r} 5 \\ 41 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{5 6} \\ & 58 \end{aligned}$ | 8 |
| 29 |  | 48 | $\begin{array}{\|l\|} \hline 53 \\ 56 \\ \hline \end{array}$ | $\begin{aligned} & 40 \\ & 42 \\ & \hline \end{aligned}$ | $\begin{aligned} & 55 \\ & 54 \end{aligned}$ |  | 45 | $\begin{aligned} & \mathbf{2 2} \\ & 56 \\ & \hline \end{aligned}$ | $\begin{array}{\|} 29 \\ 14 \\ \hline \end{array}$ | $\begin{array}{r} 35 \\ 4 \\ \hline \end{array}$ |  | 41 | $\begin{array}{\|l} \mathbf{2 1} \\ 55 \\ \hline \end{array}$ | $\begin{array}{\|l} 57 \\ 44 \\ \hline \end{array}$ | $\begin{array}{\|l} 49 \\ 13 \end{array}$ |  | 36 | $\begin{array}{\|l\|l} \mathbf{5 1} \\ 55 \\ \hline \end{array}$ | $\begin{array}{r} 4 \\ 13 \\ \hline \end{array}$ | $\begin{array}{\|l} 13 \\ 19 \\ \hline \end{array}$ |  | 31 | $\begin{aligned} & 48 \\ & 54 \end{aligned}$ | $\begin{array}{\|} 47 \\ 41 \\ \hline \end{array}$ | $\begin{array}{\|l} 54 \\ 26 \end{array}$ |  |
| 30 | 25 | 49 | $\begin{array}{\|l\|} \hline \mathbf{5 0} \\ 56 \\ \hline \end{array}$ | $\begin{aligned} & 23 \\ & 42 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 49 \\ 26 \\ \hline \end{array}$ | 26 | 46 | $\begin{aligned} & 18 \\ & 56 \end{aligned}$ | $\begin{aligned} & 43 \\ & 13 \end{aligned}$ | $\begin{aligned} & 39 \\ & 35 \\ & \hline \end{aligned}$ | 27 | 42 | $\begin{array}{\|l\|} \hline \mathbf{1 7} \\ 55 \\ \hline \end{array}$ | $\begin{aligned} & \hline \mathbf{4 2} \\ & 43 \\ & \hline \end{aligned}$ | $\begin{array}{r} 2 \\ 42 \\ \hline \end{array}$ | 28 | 37 | $\begin{aligned} & 4^{6} \\ & 55 \end{aligned}$ | $\begin{array}{\|l\|} \hline 17 \\ 12 \\ \hline \end{array}$ | $\begin{aligned} & 32 \\ & 48 \\ & \hline \end{aligned}$ | 29 | 32 | $\begin{aligned} & 43 \\ & 54 \\ & \hline \end{aligned}$ | $\begin{aligned} & 29 \\ & 40 \\ & \hline \end{aligned}$ | $\begin{aligned} & \mathbf{2 0} \\ & 54 \\ & \hline \end{aligned}$ |  |

Bürgi's 1' sine table (reconstruction, D. Roegel, 2016)

| , | $25^{\circ}$ |  |  |  |  | $26^{\circ}$ |  |  |  |  | $27^{\circ}$ |  |  |  |  | $28^{\circ}$ |  |  |  |  | $29^{\circ}$ |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 30 | 25 | 49 | $\begin{aligned} & \mathbf{5 0} \\ & 56 \\ & \hline \end{aligned}$ | $\begin{array}{l\|} \hline 23 \\ 4^{2} \end{array}$ | $\begin{aligned} & 49 \\ & 26 \end{aligned}$ | 26 | 46 | $\begin{aligned} & 18 \\ & 56 \end{aligned}$ | $\begin{array}{\|l\|} \hline 43 \\ 13 \end{array}$ | $\begin{aligned} & 39 \\ & 35 \end{aligned}$ | 27 | 42 | $\begin{aligned} & \mathbf{1 7} \\ & 55 \end{aligned}$ | $42$ | $\begin{array}{\|r} \hline 2 \\ 42 \\ \hline \end{array}$ | 28 | 37 | $\begin{gathered} 46 \\ 55 \\ \hline \end{gathered}$ | $\begin{aligned} & \hline 17 \\ & 12 \end{aligned}$ | $\begin{aligned} & \mathbf{3 2} \\ & 48 \end{aligned}$ | 29 | 32 | $\begin{aligned} & 43 \\ & 54 \\ & \hline \end{aligned}$ | $\begin{aligned} & 29 \\ & 40 \\ & \hline \end{aligned}$ | $\begin{aligned} & \hline 20 \\ & 54 \\ & \hline \end{aligned}$ | 30 |
| 31 |  | 50 | $\begin{aligned} & 47 \\ & 56 \\ & \hline \end{aligned}$ | $\begin{array}{r} 6 \\ 41 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 15 \\ 57 \\ \hline \end{array}$ |  | 47 | $\begin{aligned} & 14 \\ & 56 \\ & \hline \end{aligned}$ | $\begin{aligned} & 57 \\ & 13 \end{aligned}$ | $\begin{array}{r} 14 \\ \hline 6 \end{array}$ |  | 43 | $\begin{aligned} & 13 \\ & 55 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 25 \\ 43 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 44 \\ 11 \end{array}$ |  | 38 | $\begin{aligned} & \mathbf{4 1} \\ & 55 \\ & \hline \end{aligned}$ | $\begin{aligned} & 30 \\ & 12 \end{aligned}$ | $\begin{array}{\|l\|} \hline 20 \\ 17 \\ \hline \end{array}$ |  | 33 | $\begin{aligned} & 38 \\ & 54 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 10 \\ 40 \\ \hline \end{array}$ | $\begin{array}{l\|} \hline 14 \\ 21 \end{array}$ | 31 |
| 32 |  | 51 | $\begin{aligned} & 43 \\ & 56 \\ & \hline \end{aligned}$ | $\begin{aligned} & 48 \\ & 41 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 12 \\ 29 \\ \hline \end{array}$ |  | 48 | $\begin{array}{\|l\|l\|} \hline \mathbf{1 1} \\ 56 \\ \hline \end{array}$ | $\begin{aligned} & 10 \\ & 12 \end{aligned}$ | $\begin{aligned} & 20 \\ & 35 \\ & \hline \end{aligned}$ |  | 44 | $\begin{array}{r} 9 \\ 55 \\ \hline \end{array}$ | $\begin{array}{\|r\|} \hline 8 \\ 4^{2} \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 55 \\ 41 \\ \hline \end{array}$ |  | 39 | $\begin{gathered} 36 \\ 55 \\ \hline \end{gathered}$ | $\begin{aligned} & \hline 42 \\ & 11 \end{aligned}$ | $\begin{array}{\|l} \hline 37 \\ 45 \\ \hline \end{array}$ |  | 34 | $\begin{aligned} & 32 \\ & 54 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 50 \\ 39 \\ \hline \end{array}$ | $\begin{array}{\|l} 35 \\ 49 \\ \hline \end{array}$ | 32 |
| 33 |  | 52 | $\begin{aligned} & 40 \\ & 56 \\ & \hline \end{aligned}$ | $\begin{aligned} & 29 \\ & 41 \\ & \hline \end{aligned}$ | $\begin{array}{r} 41 \\ 1 \end{array}$ |  | 49 | $\begin{array}{r} 7 \\ 5^{6} \\ \hline \end{array}$ | $\begin{aligned} & 22 \\ & 12 \end{aligned}$ | $\begin{array}{r} 55 \\ \hline \end{array}$ |  | 45 | $\begin{array}{r} 4 \\ 55 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 51 \\ 4^{2} \\ \hline \end{array}$ | $\begin{aligned} & \hline 36 \\ & 11 \end{aligned}$ |  | 40 | $\begin{gathered} \mathbf{3 1} \\ 55 \\ \hline \end{gathered}$ | $\begin{array}{\|l\|} \hline 54 \\ 11 \end{array}$ | $\begin{array}{\|l} 22 \\ 14 \\ \hline \end{array}$ |  | 35 | $\begin{aligned} & \mathbf{2 7} \\ & 54 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline \mathbf{3 0} \\ 39 \\ \hline \end{array}$ | $\begin{aligned} & 24 \\ & \hline 16 \\ & \hline \end{aligned}$ | 33 |
| 34 |  | 53 | $\begin{aligned} & 37 \\ & 56 \\ & \hline \end{aligned}$ | $\begin{aligned} & 10 \\ & 40 \\ & \hline \end{aligned}$ | $\begin{aligned} & \mathbf{4 2}^{2} \\ & 3^{2} \\ & \hline \end{aligned}$ |  | 50 | $\begin{array}{r} 3 \\ 56 \\ \hline \end{array}$ | $\begin{aligned} & 35 \\ & 11 \end{aligned}$ | $\begin{array}{r} \mathbf{2} \\ 37 \\ \hline \end{array}$ |  | 46 | $\begin{array}{r} \mathbf{o} \\ 55 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 33 \\ 41 \\ \hline \end{array}$ | $\begin{aligned} & 47 \\ & 40 \\ & \hline \end{aligned}$ |  | 41 | $\begin{array}{\|l} \hline 27 \\ 55 \\ \hline \end{array}$ | $\begin{array}{r} 5 \\ 10 \end{array}$ | $\begin{aligned} & 36 \\ & 4^{2} \end{aligned}$ |  | 36 | $\begin{aligned} & 22 \\ & 54 \\ & \hline \end{aligned}$ | $\begin{array}{\|r} 9 \\ 38 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 40 \\ 44 \\ \hline \end{array}$ | 34 |
| 35 |  | 54 | $\begin{aligned} & 33 \\ & 56 \\ & \hline \end{aligned}$ | $\begin{aligned} & 51 \\ & 40 \\ & \hline \end{aligned}$ | $\begin{array}{r} 14 \\ 4 \\ \hline \end{array}$ |  | 50 | $\begin{aligned} & 59 \\ & 56 \end{aligned}$ | $\begin{aligned} & 46 \\ & 11 \end{aligned}$ | $\begin{array}{r} 39 \\ 8 \end{array}$ |  | 46 | $\begin{aligned} & \mathbf{5 6} \\ & 55 \end{aligned}$ | $\begin{aligned} & 15 \\ & 41 \end{aligned}$ | $\begin{array}{\|l} \hline 27 \\ 10 \end{array}$ |  | 42 | $\begin{aligned} & \mathbf{2 2} \\ & 55 \\ & \hline \end{aligned}$ | $\begin{aligned} & \hline 16 \\ & 10 \end{aligned}$ | $\begin{aligned} & 18 \\ & 11 \end{aligned}$ |  | 37 | $\begin{aligned} & 16 \\ & 54 \end{aligned}$ | $\begin{aligned} & 48 \\ & 38 \end{aligned}$ | $24$ | 35 |
| 36 |  | 55 | $\begin{aligned} & 30 \\ & 56 \\ & \hline \end{aligned}$ | $\begin{aligned} & \hline \mathbf{3 1} \\ & 39 \\ & \hline \end{aligned}$ | $\begin{aligned} & 18 \\ & 36 \end{aligned}$ |  | 51 | $\begin{aligned} & 55 \\ & 56 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 57 \\ 10 \\ \hline \end{array}$ | $\begin{aligned} & 47 \\ & 38 \\ & \hline \end{aligned}$ |  | 47 | $\begin{array}{\|l\|} \mathbf{5 1} \\ \mathbf{5 5} \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 56 \\ 40 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 37 \\ 39 \\ \hline \end{array}$ |  | 43 | $\begin{array}{\|l} \hline \mathbf{1 7} \\ 55 \\ \hline \end{array}$ | $\begin{array}{r} 26 \\ \hline 9 \\ \hline \end{array}$ | $\begin{aligned} & 29 \\ & 39 \end{aligned}$ |  | 38 | $\begin{array}{\|l\|} \hline \mathbf{1 1} \\ 54 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 26 \\ 37 \\ \hline \end{array}$ | $\begin{aligned} & 35 \\ & 39 \\ & \hline \end{aligned}$ | 36 |
| 37 |  | 56 | $\begin{aligned} & 27 \\ & 56 \\ & \hline \end{aligned}$ | $\begin{aligned} & 10 \\ & 39 \end{aligned}$ | $\begin{array}{r} 54 \\ 7 \\ \hline \end{array}$ |  | 52 | $\begin{aligned} & 52 \\ & 56 \end{aligned}$ | $\begin{array}{r} 8 \\ 10 \end{array}$ | $\begin{array}{r} 25 \\ \hline 9 \\ \hline \end{array}$ |  | 48 | $\begin{aligned} & 47 \\ & 55 \\ & \hline \end{aligned}$ | $\begin{aligned} & 37 \\ & 40 \\ & \hline \end{aligned}$ | $\begin{array}{r} 16 \\ 9 \end{array}$ |  | 44 | $\begin{aligned} & 12 \\ & 55 \\ & \hline \end{aligned}$ | $\begin{array}{r} 36 \\ \hline 9 \\ \hline \end{array}$ | $\begin{aligned} & 8 \\ & 8 \end{aligned}$ |  | 39 | $\begin{array}{r} 6 \\ 54 \\ \hline \end{array}$ | $\begin{array}{r} 4 \\ 37 \\ \hline \end{array}$ | $14$ | 37 |
| $3^{8}$ |  | 57 | $\begin{array}{\|l} 23 \\ 56 \\ \hline \end{array}$ | $\begin{aligned} & 50 \\ & 38 \\ & \hline \end{aligned}$ | $\begin{array}{r} 1 \\ 3^{8} \\ \hline \end{array}$ |  | 53 | $\begin{aligned} & 48 \\ & 56 \end{aligned}$ | $\begin{array}{r} 18 \\ \hline 9 \\ \hline \end{array}$ | $\begin{aligned} & 34 \\ & 39 \end{aligned}$ |  | 49 | $\begin{aligned} & 43 \\ & 55 \\ & \hline \end{aligned}$ | $\begin{aligned} & 17 \\ & 39 \\ & \hline \end{aligned}$ | $\begin{aligned} & 25 \\ & 38 \\ & \hline \end{aligned}$ |  | 45 | $\begin{array}{r} 7 \\ 55 \\ \hline \end{array}$ | $\begin{array}{r} 45 \\ 8 \end{array}$ | $\begin{aligned} & 16 \\ & 36 \end{aligned}$ |  | 40 | $\begin{array}{r} \mathbf{0} \\ 54 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline \mathbf{4 1} \\ 36 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 21 \\ 33 \\ \hline \end{array}$ | 38 |
| 39 |  | $5^{8}$ | $\begin{aligned} & 20 \\ & 56 \end{aligned}$ | $\begin{aligned} & 28 \\ & 38 \\ & \hline \end{aligned}$ | $\begin{aligned} & 39 \\ & 10 \end{aligned}$ |  | 54 | $\begin{aligned} & 44 \\ & 56 \\ & \hline \end{aligned}$ | $\begin{array}{r} 28 \\ 9 \end{array}$ | $\begin{array}{\|l} 13 \\ 10 \end{array}$ |  | 50 | $\begin{aligned} & 38 \\ & 55 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 57 \\ 39 \\ \hline \end{array}$ | $\begin{aligned} & 3 \\ & 8 \\ & \hline \end{aligned}$ |  | 46 | $\begin{array}{r} \mathbf{2} \\ 55 \\ \hline \end{array}$ | $\begin{array}{\|r} 53 \\ 8 \end{array}$ | $\begin{array}{r} \mathbf{5}^{2} \\ 5 \\ \hline \end{array}$ |  | 40 | $\begin{array}{\|l} 55 \\ 54 \\ \hline \end{array}$ | $\begin{aligned} & 17 \\ & 36 \\ & \hline \end{aligned}$ | $\begin{array}{r} 54 \\ 2 \end{array}$ | 39 |
| 40 | 25 | 59 | $\begin{aligned} & \mathbf{1 7} \\ & 56 \end{aligned}$ | $\begin{array}{r} 6 \\ 37 \\ \hline \end{array}$ | $\begin{aligned} & 49 \\ & 42 \end{aligned}$ | 26 | 55 | $\begin{aligned} & 40 \\ & 56 \end{aligned}$ | $\begin{array}{r} 37 \\ 8 \end{array}$ | $\begin{array}{\|l} 23 \\ 40 \\ \hline \end{array}$ | 27 | 51 | $\begin{array}{\|l\|} \hline 34 \\ 55 \end{array}$ | $\begin{aligned} & 36 \\ & 3^{8} \end{aligned}$ | $\begin{array}{\|l\|} \hline \mathbf{1 1} \\ 37 \\ \hline \end{array}$ | 28 | 46 | $\begin{aligned} & 58 \\ & 55 \end{aligned}$ | $7$ | $\begin{array}{\|l} 57 \\ 33 \end{array}$ | 29 | 41 | $\begin{aligned} & 49 \\ & 54 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 53 \\ 35 \\ \hline \end{array}$ | $\begin{aligned} & 56 \\ & 28 \end{aligned}$ | 40 |
| 41 | 26 | 0 | $\begin{aligned} & 13 \\ & 56 \\ & \hline \end{aligned}$ | $\begin{aligned} & 44 \\ & 37 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \mathbf{3 1} \\ \mathbf{1 3} \end{array}$ |  | 56 | $\begin{aligned} & 36 \\ & 56 \end{aligned}$ | $\begin{array}{r} 46 \\ 8 \end{array}$ | $\begin{array}{r} 3 \\ 10 \end{array}$ |  | 52 | $\begin{aligned} & 30 \\ & 55 \end{aligned}$ | $\begin{array}{\|l\|} \hline 14 \\ 38 \end{array}$ | $\begin{array}{r} 48 \\ \hline \\ \hline \end{array}$ |  | 47 | $\begin{aligned} & 53 \\ & 55 \\ & \hline \end{aligned}$ | $\begin{aligned} & 9 \\ & 7 \end{aligned}$ | $\begin{array}{r} 30 \\ 2 \end{array}$ |  | 42 | $\begin{array}{\|l} 44 \\ 54 \\ \hline \end{array}$ | $\begin{aligned} & 29 \\ & 34 \end{aligned}$ | $\begin{array}{\|} \mathbf{2 4} \\ 57 \\ \hline \end{array}$ | 41 |
| 42 |  | 1 | $\begin{array}{\|l\|} \hline 10 \\ 56 \\ \hline \end{array}$ | $\begin{aligned} & \hline 21 \\ & 36 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 44 \\ 45 \\ \hline \end{array}$ |  | 57 | $\begin{aligned} & 32 \\ & 56 \\ & \hline \end{aligned}$ | $\begin{array}{r} 54 \\ \hline 7 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 13 \\ 41 \\ \hline \end{array}$ |  | 53 | $\begin{array}{\|l\|} \hline 25 \\ 55 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 52 \\ 37 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 55 \\ 36 \\ \hline \end{array}$ |  | 48 | $\begin{aligned} & 48 \\ & 55 \\ & \hline \end{aligned}$ | $\begin{array}{\|r} \hline 16 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 32 \\ 30 \\ \hline \end{array}$ |  | 43 | $\begin{aligned} & 39 \\ & 54 \\ & \hline \end{aligned}$ | $\begin{array}{r} 4 \\ 34 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 21 \\ 23 \\ \hline \end{array}$ | 42 |
| 43 |  | 2 | $\begin{array}{\|r\|} \hline 6 \\ 56 \\ \hline \end{array}$ | $\begin{aligned} & 58 \\ & 36 \\ & \hline \end{aligned}$ | $\begin{aligned} & 29 \\ & 16 \end{aligned}$ |  | 58 | $\begin{aligned} & 29 \\ & 56 \end{aligned}$ | $7$ | $\begin{aligned} & 54 \\ & 12 \end{aligned}$ |  | 54 | $\begin{array}{\|l} \mathbf{2 1} \\ 55 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline \mathbf{3 0} \\ 37 \\ \hline \end{array}$ | $\begin{array}{r} 31 \\ \hline \end{array}$ |  | 49 | $\begin{aligned} & 43 \\ & 55 \\ & \hline \end{aligned}$ | $\begin{array}{r} 23 \\ \hline 5 \end{array}$ | $\begin{array}{r} \mathbf{2} \\ 58 \\ \hline \end{array}$ |  | 44 | $\begin{array}{\|l} 33 \\ 54 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 38 \\ 33 \\ \hline \end{array}$ | $\begin{aligned} & 44 \\ & 51 \\ & \hline \end{aligned}$ | 43 |
| 44 |  | 3 | $\begin{array}{\|r} 3 \\ 56 \\ \hline \end{array}$ | $\begin{aligned} & \hline 34 \\ & 35 \\ & \hline \end{aligned}$ | $\begin{aligned} & 45 \\ & 47 \\ & \hline \end{aligned}$ |  | 59 | $\begin{array}{\|l} \hline 25 \\ 56 \\ \hline \end{array}$ | $\begin{aligned} & 9 \\ & 6 \end{aligned}$ | $\begin{array}{r} 6 \\ 42 \\ \hline \end{array}$ |  | 55 | $\begin{array}{\|l\|} \hline \mathbf{1 7} \\ 55 \\ \hline \end{array}$ | $\begin{array}{r} 7 \\ 3^{6} \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 36 \\ 35 \\ \hline \end{array}$ |  | 50 | $\begin{aligned} & 38 \\ & 55 \\ & \hline \end{aligned}$ | $\begin{array}{r} 29 \\ \hline \\ \hline \end{array}$ | $\begin{array}{\|r} \hline \mathbf{o} \\ \mathbf{2 7} \\ \hline \end{array}$ |  | 45 | $\begin{array}{\|l} \hline 28 \\ 54 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 12 \\ 33 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 35 \\ 18 \\ \hline \end{array}$ | 44 |
| 45 |  | 4 | $\begin{array}{r} \mathbf{o} \\ 56 \\ \hline \end{array}$ | $\begin{aligned} & 10 \\ & 35 \\ & \hline \end{aligned}$ | $\begin{aligned} & \mathbf{3 2}^{2} \\ & \mathbf{1 9} \\ & \hline \end{aligned}$ | 27 | 0 | $\begin{aligned} & \mathbf{2 1} \\ & 56 \\ & \hline \end{aligned}$ | $\begin{array}{r} 15 \\ 6 \end{array}$ | $\begin{aligned} & 48 \\ & 12 \end{aligned}$ |  | 56 | $\begin{array}{\|l} \mathbf{1 2} \\ 55 \\ \hline \end{array}$ | $\begin{aligned} & 44 \\ & 36 \\ & \hline \end{aligned}$ | $\begin{array}{r} 11 \\ \hline 4 \\ \hline \end{array}$ |  | 51 | $\begin{array}{\|l} 33 \\ 55 \\ \hline \end{array}$ | $\begin{array}{r} 34 \\ 4 \\ \hline \end{array}$ | $\begin{array}{\|l} \mathbf{2 7} \\ 55 \\ \hline \end{array}$ |  | 46 | $\begin{array}{\|l} \mathbf{2 2} \\ 54 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 45 \\ 32 \\ \hline \end{array}$ | $\begin{array}{\|l} 53 \\ 46 \\ \hline \end{array}$ | 45 |
| 46 |  | 4 | $\begin{aligned} & 56 \\ & 56 \\ & \hline \end{aligned}$ | $\begin{aligned} & 45 \\ & 34 \end{aligned}$ | $\begin{array}{\|l} \hline 51 \\ 50 \end{array}$ |  | 1 | $\begin{aligned} & \mathbf{1 7} \\ & 56 \\ & \hline \end{aligned}$ | $\begin{array}{r} 22 \\ 5 \\ \hline \end{array}$ | $\begin{array}{r} \mathbf{o} \\ 43 \\ \hline \end{array}$ |  | 57 | $\begin{array}{r} 8 \\ 55 \end{array}$ | $\begin{aligned} & 20 \\ & 35 \end{aligned}$ | $\begin{array}{\|l} 15 \\ 34 \\ \hline \end{array}$ |  | 52 | $\begin{aligned} & 28 \\ & 55 \end{aligned}$ | $39$ | $\begin{array}{\|l} 22 \\ 23 \\ \hline \end{array}$ |  | 47 | $\begin{array}{\|l} \mathbf{1 7} \\ 54 \\ \hline \end{array}$ | $\begin{aligned} & 18 \\ & 32 \end{aligned}$ | $\begin{array}{\|l\|} \hline 39 \\ 13 \\ \hline \end{array}$ | 46 |
| 47 |  | 5 | $\begin{aligned} & 53 \\ & 56 \\ & \hline \end{aligned}$ | $\begin{aligned} & 20 \\ & 34 \\ & \hline \end{aligned}$ | $\begin{aligned} & 41 \\ & 22 \end{aligned}$ |  | 2 | $\begin{aligned} & 13 \\ & 56 \\ & \hline \end{aligned}$ | $\begin{array}{r} 27 \\ 5 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 43 \\ 13 \\ \hline \end{array}$ |  | 58 | $\begin{array}{r} 3 \\ 55 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 55 \\ 35 \\ \hline \end{array}$ | $49$ |  | 53 | $\begin{array}{\|l} 23 \\ 55 \\ \hline \end{array}$ | $43$ | $\begin{aligned} & 45 \\ & 52 \\ & \hline \end{aligned}$ |  | 48 | $\begin{array}{\|l\|} \hline \mathbf{1 1} \\ 54 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 50 \\ 31 \\ \hline \end{array}$ | $\begin{aligned} & 5^{2} \\ & 40 \\ & \hline \end{aligned}$ | 47 |
| 48 |  | 6 | $\begin{aligned} & 49 \\ & 56 \end{aligned}$ | $\begin{aligned} & \hline 55 \\ & 33 \\ & \hline \end{aligned}$ | $\begin{array}{r} 3 \\ 53 \\ \hline \end{array}$ |  | 3 | $\begin{array}{r} 9 \\ 56 \\ \hline \end{array}$ | $\begin{array}{r} 32 \\ 4 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline \mathbf{5 6} \\ 43 \\ \hline \end{array}$ |  | 58 | $\begin{aligned} & \mathbf{5 9} \\ & 55 \end{aligned}$ | $\begin{array}{\|l} \hline 30 \\ 34 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{5 2}^{2} \\ & 32 \end{aligned}$ |  | 54 | $\begin{aligned} & \hline 18 \\ & 55 \\ & \hline \end{aligned}$ | $\begin{array}{r} 47 \\ \hline \end{array}$ | $\begin{aligned} & 37 \\ & 20 \end{aligned}$ |  | 49 | $\begin{array}{r} 6 \\ 54 \\ \hline \end{array}$ | $\begin{aligned} & 22 \\ & 31 \\ & \hline \end{aligned}$ | $\begin{array}{r} 32 \\ 8 \end{array}$ | 48 |
| 49 |  | 7 | $\begin{aligned} & 46 \\ & 56 \\ & \hline \end{aligned}$ | $\begin{aligned} & 28 \\ & 33 \end{aligned}$ | $\begin{aligned} & 56 \\ & 24 \\ & \hline \end{aligned}$ |  | 4 | $\begin{array}{r} 5 \\ 56 \\ \hline \end{array}$ | $\begin{array}{\|r} 37 \\ 4 \\ \hline \end{array}$ | $\begin{aligned} & 39 \\ & 14 \end{aligned}$ |  | 59 | $\begin{aligned} & 55 \\ & 55 \\ & \hline \end{aligned}$ | $\begin{array}{\|r} \hline 5 \\ 34 \\ \hline \end{array}$ | $24$ |  | 55 | $\begin{array}{\|l} \mathbf{1 3} \\ 55 \\ \hline \end{array}$ | $\begin{array}{r} 50 \\ 20 \end{array}$ | $\begin{array}{\|l} 57 \\ 48 \\ \hline \end{array}$ |  | 50 | $\begin{array}{r} \mathbf{o} \\ 54 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 53 \\ 30 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{4 0} \\ & 35 \\ & \hline \end{aligned}$ | 49 |
| 50 | 26 | 8 | $\begin{aligned} & 43 \\ & 56 \\ & \hline \end{aligned}$ | $\begin{array}{r} 2 \\ 3^{2} \\ \hline \end{array}$ | $\begin{aligned} & 20 \\ & 56 \\ & \hline \end{aligned}$ | 27 | 5 | $\begin{array}{r} 1 \\ 5^{6} \\ \hline \end{array}$ | $\begin{array}{\|r} 41 \\ 3 \\ \hline \end{array}$ | $\begin{array}{\|l} 53 \\ 44 \\ \hline \end{array}$ | 28 | 0 | $\begin{aligned} & 50 \\ & 55 \end{aligned}$ | $\begin{array}{\|l\|} \hline 39 \\ 33 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 25 \\ 31 \\ \hline \end{array}$ | 28 | 56 | $\begin{array}{r} 8 \\ 55 \\ \hline \end{array}$ | $\begin{array}{r} 53 \\ 2 \end{array}$ | $\begin{array}{\|l} 45 \\ 17 \\ \hline \end{array}$ | 29 | 50 | $\begin{array}{\|l} 55 \\ 54 \\ \hline \end{array}$ | $\begin{aligned} & 24 \\ & 30 \\ & \hline \end{aligned}$ | $\begin{array}{r} 15 \\ 2 \end{array}$ | 50 |
| 51 |  | 9 | $\begin{array}{\|l} 39 \\ 56 \\ \hline \end{array}$ | $\begin{aligned} & 35 \\ & 32 \\ & \hline \end{aligned}$ | $\begin{aligned} & 16 \\ & 27 \\ & \hline \end{aligned}$ |  | 5 | $\begin{aligned} & 57 \\ & 56 \\ & \hline \end{aligned}$ | $\begin{array}{\|r} 45 \\ 3 \\ \hline \end{array}$ | $\begin{array}{\|l} 37 \\ 14 \\ \hline \end{array}$ |  | 1 | $\begin{aligned} & 46 \\ & 55 \end{aligned}$ | $\begin{array}{\|l} 12 \\ 33 \\ \hline \end{array}$ | $\begin{gathered} 56 \\ 0 \end{gathered}$ |  | 57 | $\begin{array}{r} 3 \\ 55 \\ \hline \end{array}$ | $\begin{gathered} 56 \\ 1 \end{gathered}$ | $\begin{array}{r} \mathbf{2} \\ 45 \\ \hline \end{array}$ |  | 51 | $\begin{aligned} & 49 \\ & 54 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 54 \\ 29 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline \mathbf{1 7} \\ \mathbf{2 9} \\ \hline \end{array}$ | 51 |
| 52 |  | 10 | $\begin{aligned} & 36 \\ & 56 \\ & \hline \end{aligned}$ | $\begin{array}{\|r} 7 \\ 31 \\ \hline \end{array}$ | $\begin{aligned} & 43 \\ & 58 \\ & \hline \end{aligned}$ |  | 6 | $\begin{aligned} & 53 \\ & 56 \\ & \hline \end{aligned}$ | $\begin{array}{r} 48 \\ 2 \end{array}$ | $\begin{array}{\|l\|} \mathbf{5 1} \\ \mathbf{4 4} \end{array}$ |  | 2 | $\begin{aligned} & \mathbf{4 1} \\ & 55 \\ & \hline \end{aligned}$ | $\begin{aligned} & 45 \\ & 32 \end{aligned}$ | $\begin{array}{\|l} \hline 56 \\ 29 \\ \hline \end{array}$ |  | 57 | $\begin{aligned} & 58 \\ & 55 \end{aligned}$ | $\begin{array}{\|r} 57 \\ 1 \end{array}$ | $\begin{array}{\|l} 47 \\ 13 \end{array}$ |  | 52 | $\begin{aligned} & 44 \\ & 54 \\ & \hline \end{aligned}$ | $\begin{aligned} & 23 \\ & 28 \end{aligned}$ | $\begin{aligned} & 46 \\ & 57 \\ & \hline \end{aligned}$ | 5 |
| 53 |  | 11 | $\begin{aligned} & 32 \\ & 56 \end{aligned}$ | $\begin{aligned} & 39 \\ & 31 \end{aligned}$ | $\begin{aligned} & \mathbf{4 1}^{1} \\ & \mathbf{n}^{0} \end{aligned}$ |  | 7 | $\begin{aligned} & 49 \\ & 56 \end{aligned}$ | $\begin{array}{r} 51 \\ 2 \end{array}$ | $\begin{aligned} & 35 \\ & 15 \end{aligned}$ |  | 3 | $\begin{aligned} & 37 \\ & 55 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 18 \\ 31 \end{array}$ | $\begin{array}{\|l} \hline 25 \\ 59 \\ \hline \end{array}$ |  | $5^{8}$ | $\begin{aligned} & 53 \\ & 55 \\ & \hline \end{aligned}$ | $\begin{array}{r} 59 \\ 0 \end{array}$ | $\begin{array}{r} 0 \\ \mathbf{4}^{1} \\ \hline \end{array}$ |  | 53 | $\begin{aligned} & 38 \\ & 54 \\ & \hline \end{aligned}$ | $\begin{aligned} & \mathbf{5 2} \\ & 28 \end{aligned}$ | $\begin{aligned} & 43 \\ & 23 \end{aligned}$ | 53 |
| 54 |  | 12 | $\begin{aligned} & 29 \\ & 56 \end{aligned}$ | $\begin{aligned} & 11 \\ & 31 \\ & \hline \end{aligned}$ | $\begin{array}{r} \mathbf{1 1} \\ \mathbf{0} \end{array}$ |  | 8 | $\begin{aligned} & 45 \\ & 56 \end{aligned}$ | $\begin{array}{\|r} 53 \\ 1 \end{array}$ | $\begin{array}{\|l} 50 \\ 45 \end{array}$ |  | 4 | $\begin{aligned} & \mathbf{3 2} \\ & 55 \end{aligned}$ | $\begin{aligned} & 50 \\ & 31 \end{aligned}$ | $\begin{array}{\|l} 24 \\ 27 \\ \hline \end{array}$ |  | 59 | $\begin{aligned} & 48 \\ & 55 \end{aligned}$ | $\begin{array}{\|c} 59 \\ 0 \end{array}$ | $\begin{array}{\|l} 41 \\ 10 \end{array}$ |  | 54 | $\begin{aligned} & 33 \\ & 54 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \mathbf{2 1} \\ \mathbf{2 7} \\ \hline \end{array}$ | $\begin{array}{r} 6 \\ 51 \end{array}$ | 54 |
| 55 |  | 13 | $\begin{aligned} & 25 \\ & 56 \\ & \hline \end{aligned}$ | $\begin{aligned} & 4^{2} \\ & 30 \\ & \hline \end{aligned}$ | $\begin{aligned} & 11 \\ & 32 \end{aligned}$ |  | 9 | $\begin{aligned} & \mathbf{4 1} \\ & 56 \\ & \hline \end{aligned}$ | $\begin{array}{r} 55 \\ 1 \end{array}$ | $\begin{aligned} & 35 \\ & 15 \\ & \hline \end{aligned}$ |  | 5 | $\begin{aligned} & 28 \\ & 55 \\ & \hline \end{aligned}$ | $\begin{aligned} & 21 \\ & 30 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline \mathbf{5 1} \\ 57 \\ \hline \end{array}$ | 29 | 0 | $\begin{aligned} & 43 \\ & 54 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 59 \\ 59 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{5 1} \\ & \mathbf{3 7} \\ & \hline \end{aligned}$ |  | 55 | $\begin{array}{\|l} \hline 27 \\ 54 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 48 \\ 27 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 57 \\ 19 \\ \hline \end{array}$ | 55 |
| 56 |  | 14 | $\begin{array}{\|l} 22 \\ 56 \\ \hline \end{array}$ | $\begin{aligned} & 12 \\ & 30 \\ & \hline \end{aligned}$ | $\begin{array}{r} 43 \\ 4 \\ \hline \end{array}$ |  | 10 | $\begin{aligned} & 37 \\ & 56 \\ & \hline \end{aligned}$ | $\begin{gathered} 56 \\ 0 \end{gathered}$ | $\begin{aligned} & 50 \\ & 45 \end{aligned}$ |  | 6 | $\begin{array}{\|l} 23 \\ 55 \\ \hline \end{array}$ | $\begin{aligned} & 52 \\ & 30 \end{aligned}$ | $\begin{aligned} & 48 \\ & 26 \end{aligned}$ |  | 1 | $\begin{aligned} & 38 \\ & 54 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 59 \\ 59 \\ \hline \end{array}$ | $\begin{array}{r} 28 \\ 6 \end{array}$ |  | 56 | $\begin{array}{\|l} \mathbf{2 2} \\ 54 \\ \hline \end{array}$ | $\begin{aligned} & 16 \\ & 26 \end{aligned}$ | $\begin{array}{\|l} \hline \mathbf{1 6} \\ 45 \\ \hline \end{array}$ | 56 |
| 57 |  | 15 | $\begin{array}{\|l\|} \hline 18 \\ 56 \\ \hline \end{array}$ | $\begin{aligned} & 42 \\ & 29 \\ & \hline \end{aligned}$ | $\begin{aligned} & 47 \\ & 34 \\ & \hline \end{aligned}$ |  | 11 | $\begin{aligned} & 33 \\ & 56 \\ & \hline \end{aligned}$ | $\begin{array}{r} 57 \\ 0 \end{array}$ | $\begin{aligned} & 35 \\ & 16 \end{aligned}$ |  | 7 | $\begin{aligned} & 19 \\ & 55 \\ & \hline \end{aligned}$ | $\begin{aligned} & 23 \\ & 29 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline \mathbf{1 4} \\ 55 \\ \hline \end{array}$ |  | 2 | $\begin{array}{\|l} 33 \\ 54 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 58 \\ 58 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{3 4} \\ & \mathbf{3 4} \end{aligned}$ |  | 57 | $\begin{array}{\|l\|} \hline \mathbf{1 6} \\ 54 \\ \hline \end{array}$ | $\begin{array}{\|l} 43 \\ 26 \\ \hline \end{array}$ | $\begin{array}{r} 1 \\ 13 \\ \hline \end{array}$ | 57 |
| 58 |  | 16 | $\begin{aligned} & 15 \\ & 56 \end{aligned}$ | $\begin{aligned} & 12 \\ & 29 \end{aligned}$ | $\begin{array}{r} 21 \\ 6 \end{array}$ |  | 12 | $\begin{aligned} & 29 \\ & 55 \end{aligned}$ | $\begin{aligned} & 57 \\ & 59 \end{aligned}$ | $\begin{array}{\|l} \mathbf{5 1} \\ 46 \end{array}$ |  | 8 | $\begin{aligned} & \mathbf{1 4} \\ & 55 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} 53 \\ 29 \\ \hline \end{array}$ | $\begin{array}{r} 9 \\ 25 \\ \hline \end{array}$ |  | 3 | $\begin{aligned} & \mathbf{2 8} \\ & 54 \end{aligned}$ | $\begin{aligned} & 57 \\ & 58 \\ & \hline \end{aligned}$ | 8 2 |  | $5^{8}$ | $\begin{array}{\|l\|} \hline \mathbf{1 1} \\ 54 \end{array}$ | 9 25 | $\begin{array}{\|l} \mathbf{1 4} \\ 39 \\ \hline \end{array}$ | 58 |
| 59 |  | 17 | $\begin{array}{\|l\|} \hline 11 \\ 56 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline \mathbf{4 1} \\ \mathbf{2 8} \end{array}$ | $\begin{array}{\|l} 27 \\ 37 \\ \hline \end{array}$ |  | 13 | $\begin{aligned} & 25 \\ & 55 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 57 \\ 59 \\ \hline \end{array}$ | $\begin{aligned} & 37 \\ & 16 \end{aligned}$ |  | 9 | $\begin{aligned} & 10 \\ & 55 \\ & \hline \end{aligned}$ | $\begin{aligned} & 22 \\ & 28 \end{aligned}$ | $\begin{array}{\|l\|} \hline \mathbf{3 4} \\ 53 \\ \hline \end{array}$ |  | 4 | $\begin{array}{\|l} 23 \\ 54 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 55 \\ 57 \\ \hline \end{array}$ | $\begin{array}{\|l\|l} \hline 10 \\ 31 \\ \hline \end{array}$ |  | 59 | $\begin{array}{\|r} \hline 5 \\ 54 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 34 \\ 25 \\ \hline \end{array}$ | $53$ | 59 |
| 60 | 26 | 18 | $\begin{array}{r} 8 \\ 56 \end{array}$ | $\begin{aligned} & 10 \\ & 28 \\ & \hline \end{aligned}$ | $\begin{aligned} & 4 \\ & 8 \end{aligned}$ | 27 | 14 | $\begin{aligned} & 21 \\ & 55 \end{aligned}$ | $\begin{aligned} & 56 \\ & 58 \end{aligned}$ | $\begin{aligned} & 53 \\ & 46 \end{aligned}$ | 28 | 10 | $\begin{array}{r} \mathbf{5} \\ 55 \end{array}$ | $\begin{aligned} & \mathbf{5 1} \\ & \mathbf{2 8} \end{aligned}$ | $\begin{array}{\|l} \hline 27 \\ 23 \end{array}$ | 29 | 5 | $\begin{aligned} & \mathbf{1 8} \\ & 54 \end{aligned}$ | $\begin{aligned} & 5^{2} \\ & 56 \end{aligned}$ | $\begin{aligned} & \mathbf{4 1} \\ & 58 \\ & \hline \end{aligned}$ | 30 | 0 | $\begin{array}{r} \mathbf{o} \\ 54 \\ \hline \end{array}$ | $\begin{array}{r} \mathbf{0} \\ 24 \\ \hline \end{array}$ | $\begin{array}{r} \mathbf{0} \\ 34 \\ \hline \end{array}$ | 60 |

Bürgi's 1' sine table (reconstruction, D. Roegel, 2016)

| 1 | $30^{\circ}$ |  |  |  |  | $31^{\circ}$ |  |  |  |  | $32^{\circ}$ |  |  |  |  | $33^{\circ}$ |  |  |  |  | $34^{\circ}$ |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 0 | 30 | 0 | $\begin{array}{\|r\|} \hline \mathbf{o} \\ 54 \\ \hline \end{array}$ | $\begin{array}{r} 0 \\ 24 \\ \hline \end{array}$ | $\begin{array}{\|r\|} \hline \mathbf{o} \\ 34 \\ \hline \end{array}$ | 30 | 54 | $\begin{array}{r} 8 \\ 53 \end{array}$ | $\begin{aligned} & \hline 13 \\ & 51 \end{aligned}$ | $\begin{aligned} & 27 \\ & 10 \end{aligned}$ | 31 | 47 | $\begin{array}{\|l} \hline 42 \\ 53 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 33 \\ 16 \end{array}$ | $\begin{aligned} & 40 \\ & 46 \end{aligned}$ | 32 | 40 | $\begin{aligned} & 42 \\ & 5^{2} \end{aligned}$ | $\begin{array}{r} 1 \\ 41 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline \mathbf{5 4} \\ \mathbf{2 5} \\ \hline \end{array}$ | 33 | 33 | $\begin{array}{r} 5 \\ 5^{2} \end{array}$ | $\begin{array}{r} 40 \\ \hline \\ \hline \end{array}$ | $\begin{aligned} & 2 \\ & 5 \end{aligned}$ | 0 |
| 1 |  | 0 | $\begin{array}{\|l\|} \hline 54 \\ 54 \\ \hline \end{array}$ | $\begin{aligned} & \hline 24 \\ & 24 \\ & \hline \end{aligned}$ | $\begin{array}{r} 34 \\ 1 \end{array}$ |  | 55 | $\begin{array}{r} \mathbf{2} \\ 53 \end{array}$ | $\begin{array}{r} 4 \\ 50 \\ \hline \end{array}$ | $\begin{aligned} & 37 \\ & 36 \\ & \hline \end{aligned}$ |  | 48 | $\begin{array}{\|l\|} \hline 35 \\ 53 \\ \hline \end{array}$ | $\begin{aligned} & 50 \\ & 16 \\ & \hline \end{aligned}$ | $\begin{aligned} & 26 \\ & 12 \end{aligned}$ |  | 41 | $\begin{aligned} & 34 \\ & 5^{2} \end{aligned}$ | $\begin{array}{\|l} \hline 43 \\ 40 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline \mathbf{1 9} \\ 49 \\ \hline \end{array}$ |  | 33 | $\begin{aligned} & 57 \\ & 52 \\ & \hline \end{aligned}$ | $45$ | $\begin{array}{\|r} 7 \\ 29 \\ \hline \end{array}$ | 1 |
| 2 |  | 1 | $\begin{array}{\|l\|} \hline 48 \\ 54 \\ \hline \end{array}$ | $\begin{aligned} & 48 \\ & 23 \\ & \hline \end{aligned}$ | $\begin{aligned} & 35 \\ & 28 \end{aligned}$ |  | 55 | $\begin{aligned} & 55 \\ & 53 \end{aligned}$ | $\begin{aligned} & 55 \\ & 50 \\ & \hline \end{aligned}$ | $\begin{array}{r} 13 \\ 2 \end{array}$ |  | 49 | $\begin{array}{l\|} \hline 29 \\ 53 \\ \hline \end{array}$ | $\begin{array}{r} 6 \\ 15 \\ \hline \end{array}$ | $\begin{aligned} & 38 \\ & 37 \\ & \hline \end{aligned}$ |  | 42 | $\begin{aligned} & 27 \\ & 52 \end{aligned}$ | $\begin{array}{\|l\|} \hline 24 \\ 40 \\ \hline \end{array}$ | $\begin{array}{r} 8 \\ 13 \\ \hline \end{array}$ |  | 34 | $\begin{aligned} & 49 \\ & 52 \\ & \hline \end{aligned}$ | $\begin{array}{r} 49 \\ 3 \\ \hline \end{array}$ | $\begin{aligned} & 36 \\ & 5^{2} \\ & \hline \end{aligned}$ | 2 |
| 3 |  | 2 | $\begin{aligned} & 43 \\ & 54 \\ & \hline \end{aligned}$ | $\begin{aligned} & 12 \\ & 22 \end{aligned}$ | $\begin{array}{r} 3 \\ 55 \\ \hline \end{array}$ |  | 56 | $\begin{array}{\|l} 49 \\ 53 \\ \hline \end{array}$ | $\begin{aligned} & 45 \\ & 49 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 15 \\ 27 \\ \hline \end{array}$ |  | 50 | $\begin{array}{\|l\|} \hline \mathbf{2 2} \\ 53 \\ \hline \end{array}$ | $\begin{array}{\|l} 22 \\ 15 \\ \hline \end{array}$ | $\begin{array}{r} 15 \\ 2 \end{array}$ |  | 43 | $\begin{aligned} & 20 \\ & 52 \\ & \hline \end{aligned}$ | $\begin{array}{r} 4 \\ 39 \\ \hline \end{array}$ | $\begin{array}{\|l} \mathbf{2 1} \\ 37 \\ \hline \end{array}$ |  | 35 | $\begin{array}{\|l\|} \hline 41 \\ 52 \\ \hline \end{array}$ | $\begin{array}{\|r} 53 \\ 3 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 28 \\ 15 \\ \hline \end{array}$ | 3 |
| 4 |  | 3 | $\begin{array}{\|l\|} \hline 37 \\ 54 \\ \hline \end{array}$ | $\begin{aligned} & 34 \\ & 22 \end{aligned}$ | $\begin{aligned} & 58 \\ & 22 \end{aligned}$ |  | 57 | $\begin{aligned} & 43 \\ & 53 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 34 \\ 48 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{4 2} \\ & 54 \\ & \hline \end{aligned}$ |  | 51 | $\begin{array}{\|l\|} \hline 15 \\ 53 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 37 \\ 14 \\ \hline \end{array}$ | $\begin{aligned} & 17 \\ & 26 \end{aligned}$ |  | 44 | $\begin{aligned} & 12 \\ & 52 \\ & \hline \end{aligned}$ | $\begin{aligned} & 43 \\ & 39 \\ & \hline \end{aligned}$ | $58$ |  | 36 | $\begin{aligned} & 33 \\ & 5^{2} \\ & \hline \end{aligned}$ | $\begin{gathered} 56 \\ 2 \end{gathered}$ | $\begin{array}{\|l} \hline 43 \\ 38 \\ \hline \end{array}$ | 4 |
| 5 |  | 4 | $\begin{array}{\|l} \hline \mathbf{3 1} \\ \mathbf{5 4} \\ \hline \end{array}$ | $\begin{aligned} & 57 \\ & 21 \\ & \hline \end{aligned}$ | $\begin{aligned} & 20 \\ & 49 \\ & \hline \end{aligned}$ |  | 58 | $\begin{aligned} & 37 \\ & 53 \end{aligned}$ | $\begin{aligned} & 23 \\ & 48 \\ & \hline \end{aligned}$ | $\begin{aligned} & 36 \\ & 21 \\ & \hline \end{aligned}$ |  | 52 | $\begin{array}{r} 8 \\ 53 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{5 1} \\ & \mathbf{1 3} \end{aligned}$ | $\begin{aligned} & 43 \\ & 52 \end{aligned}$ |  | 45 | $\begin{array}{r} 5 \\ 5^{2} \end{array}$ | $\begin{aligned} & 22 \\ & 38 \end{aligned}$ | $\begin{aligned} & 59 \\ & 26 \end{aligned}$ |  | 37 | $\begin{aligned} & 25 \\ & 52 \end{aligned}$ | $\begin{array}{r} 59 \\ 2 \end{array}$ | $\begin{array}{\|r} 21 \\ 1 \end{array}$ | 5 |
| 6 |  | 5 | $\begin{array}{\|l\|} \hline 26 \\ 54 \\ \hline \end{array}$ | $19$ | $\begin{array}{r} 9 \\ 16 \end{array}$ |  | 59 | $\begin{aligned} & \mathbf{3 1} \\ & 53 \end{aligned}$ | $\begin{array}{\|l\|} \mathbf{1 1} \\ 47 \\ \hline \end{array}$ | $\begin{aligned} & 57 \\ & 46 \end{aligned}$ |  | 53 | $\begin{array}{\|r} \mathbf{2} \\ 53 \\ \hline \end{array}$ | $\begin{array}{\|r} 5 \\ 13 \end{array}$ | $\begin{array}{\|l} \mathbf{3 5} \\ 17 \end{array}$ |  | 45 | $\begin{aligned} & 58 \\ & 52 \end{aligned}$ | $\begin{array}{\|r} \mathbf{1} \\ \mathbf{3 7} \\ \hline \end{array}$ | $\begin{array}{\|l} 25 \\ 49 \\ \hline \end{array}$ |  | 38 | $\begin{aligned} & 18 \\ & 52 \end{aligned}$ | $\begin{aligned} & \mathbf{1} \\ & \mathbf{1} \end{aligned}$ | $\begin{array}{\|l} 22 \\ 25 \\ \hline \end{array}$ | 6 |
| 7 |  | 6 | $\begin{aligned} & 20 \\ & 54 \end{aligned}$ | $\begin{aligned} & 40 \\ & 20 \end{aligned}$ | $\begin{aligned} & \mathbf{2 5} \\ & 43 \end{aligned}$ | $3^{1}$ | 0 | $\begin{aligned} & 24 \\ & 53 \end{aligned}$ | $\begin{array}{\|l} 59 \\ 47 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 43 \\ 12 \end{array}$ |  | 53 | $\begin{aligned} & 55 \\ & 53 \\ & \hline \end{aligned}$ | $\begin{aligned} & 18 \\ & 12 \end{aligned}$ | $\begin{aligned} & 52 \\ & 42 \\ & \hline \end{aligned}$ |  | 46 | $\begin{aligned} & 50 \\ & 52 \end{aligned}$ | $\begin{array}{\|l} 39 \\ 37 \\ \hline \end{array}$ | $\begin{aligned} & 14 \\ & 14 \end{aligned}$ |  | 39 | $\begin{array}{\|l} 10 \\ 5^{2} \\ \hline \end{array}$ | $\begin{aligned} & 2 \\ & 0 \end{aligned}$ | $\begin{array}{\|l} 47 \\ 47 \\ \hline \end{array}$ | 7 |
| 8 |  | 7 | $\begin{aligned} & 15 \\ & 54 \\ & \hline \end{aligned}$ | $\begin{array}{r} 1 \\ 20 \end{array}$ | $\begin{array}{\|r\|} \hline 8 \\ 11 \end{array}$ |  | 1 | $\begin{aligned} & 18 \\ & 53 \end{aligned}$ | $\begin{aligned} & 46 \\ & 46 \\ & \hline \end{aligned}$ | $\begin{aligned} & 55 \\ & 38 \\ & \hline \end{aligned}$ |  | 54 | $48$ | $\begin{array}{\|l\|} \hline \mathbf{3 1} \\ \mathbf{1 2} \end{array}$ | $\begin{array}{r} 34 \\ \hline \end{array}$ |  | 47 | $\begin{aligned} & 43 \\ & 5^{2} \end{aligned}$ | $\begin{aligned} & 16 \\ & 36 \end{aligned}$ | $\begin{aligned} & 28 \\ & 38 \\ & \hline \end{aligned}$ |  | 40 | $\begin{array}{r} 2 \\ 5^{2} \\ \hline \end{array}$ | $\begin{aligned} & 3 \\ & 0 \end{aligned}$ | $\begin{array}{\|l\|} \hline 34 \\ 11 \end{array}$ | 8 |
| 9 |  | 8 | $\begin{array}{r} 9 \\ 54 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{2 1} \\ & 19 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 19 \\ 37 \\ \hline \end{array}$ |  | 2 | $\begin{aligned} & \mathbf{1 2} \\ & 53 \end{aligned}$ | $\begin{aligned} & 33 \\ & 46 \\ & \hline \end{aligned}$ | $\begin{array}{\|r} 33 \\ 4 \\ \hline \end{array}$ |  | 55 | $\begin{aligned} & \mathbf{4 1} \\ & 53 \end{aligned}$ | $\begin{aligned} & 43 \\ & 11 \end{aligned}$ | $\begin{aligned} & \mathbf{4}^{1} \\ & 3^{2} \end{aligned}$ |  | 48 | $\begin{aligned} & 35 \\ & 52 \\ & \hline \end{aligned}$ | $\begin{aligned} & 53 \\ & 36 \\ & \hline \end{aligned}$ | $6$ |  | 40 | $\begin{aligned} & 54 \\ & 51 \end{aligned}$ | $\begin{array}{r} 3 \\ 59 \\ \hline \end{array}$ | $\begin{array}{\|l} 45 \\ 33 \end{array}$ | 9 |
| 10 | 30 | 9 | $\begin{array}{\|r\|} \hline 3 \\ 54 \\ \hline \end{array}$ | $\begin{aligned} & 40 \\ & 19 \\ & \hline \end{aligned}$ | $\begin{array}{r} 56 \\ 4 \\ \hline \end{array}$ | 31 | 3 | $\begin{array}{r} 6 \\ 53 \end{array}$ | $\begin{aligned} & \hline 19 \\ & 45 \\ & \hline \end{aligned}$ | $\begin{aligned} & 37 \\ & 30 \\ & \hline \end{aligned}$ | 31 | 56 | $\begin{array}{\|l\|} \hline \mathbf{3 4} \\ 53 \\ \hline \end{array}$ | $\begin{array}{\|l} 55 \\ 10 \end{array}$ | $\begin{aligned} & \mathbf{1 3} \\ & 57 \\ & \hline \end{aligned}$ | 32 | 49 | $\begin{aligned} & 28 \\ & 52 \end{aligned}$ | $\begin{aligned} & 29 \\ & 35 \end{aligned}$ | $\begin{array}{r} 7 \\ 26 \end{array}$ | 33 | 41 | $\begin{aligned} & 46 \\ & 51 \end{aligned}$ | $\begin{array}{r} 3 \\ 58 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 18 \\ 57 \\ \hline \end{array}$ |  |
| 11 |  | 9 | $\begin{array}{\|l\|} \hline 58 \\ 54 \\ \hline \end{array}$ | $\begin{array}{r} \mathbf{0} \\ 18 \end{array}$ | $\begin{array}{r} \mathrm{o} \\ 30 \\ \hline \end{array}$ |  | 4 | $\begin{array}{r} \mathbf{o} \\ 53 \end{array}$ | $\begin{array}{\|r\|} \hline 5 \\ 44 \\ \hline \end{array}$ | $\begin{array}{\|r} \hline 7 \\ 55 \\ \hline \end{array}$ |  | 57 | $\begin{array}{\|l\|} \hline 28 \\ 53 \\ \hline \end{array}$ | $\begin{array}{\|r} \hline 6 \\ 10 \\ \hline \end{array}$ | $\begin{aligned} & 10 \\ & 22 \\ & \hline \end{aligned}$ |  | 50 | $\begin{aligned} & 21 \\ & 52 \\ & \hline \end{aligned}$ | $\begin{array}{\|r\|} \hline 4 \\ 34 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 33 \\ 50 \\ \hline \end{array}$ |  | 42 | $\begin{array}{\|l\|} \hline 38 \\ 51 \\ \hline \end{array}$ | $\begin{array}{\|r} \mathbf{2} \\ 58 \\ \hline \end{array}$ | $\begin{aligned} & 15 \\ & 20 \end{aligned}$ |  |
| 12 |  | 10 | $\begin{aligned} & \mathbf{5 2} \\ & 54 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 18 \\ 17 \\ \hline \end{array}$ | $\begin{aligned} & 30 \\ & 58 \\ & \hline \end{aligned}$ |  | 4 | $\begin{aligned} & 53 \\ & 53 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 50 \\ 44 \\ \hline \end{array}$ | $\begin{array}{r} 2 \\ 22 \\ \hline \end{array}$ |  | $5^{8}$ | $\begin{array}{\|l\|} \hline \mathbf{2 1} \\ 53 \\ \hline \end{array}$ | $\begin{array}{r} 16 \\ 9 \end{array}$ | $\begin{array}{\|l} \hline 32 \\ 47 \\ \hline \end{array}$ |  | 51 | $\begin{aligned} & 13 \\ & 5^{2} \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 39 \\ 34 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 23 \\ 13 \\ \hline \end{array}$ |  | 43 | $\begin{aligned} & 30 \\ & 51 \\ & \hline \end{aligned}$ | $\begin{array}{\|r} \hline \mathbf{0} \\ 57 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 35 \\ 42 \\ \hline \end{array}$ |  |
| 13 |  | 11 | $\begin{array}{\|l\|} \hline 46 \\ 54 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 36 \\ 17 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 28 \\ 25 \\ \hline \end{array}$ |  | 5 | $\begin{array}{\|l} 47 \\ 53 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 34 \\ 43 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 24 \\ 48 \\ \hline \end{array}$ |  | 59 | $\begin{array}{\|l\|} \hline 14 \\ 53 \\ \hline \end{array}$ | $\begin{array}{r} 26 \\ 9 \end{array}$ | $\begin{aligned} & 19 \\ & 12 \end{aligned}$ |  | 52 | $\begin{array}{r} 6 \\ 52 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 13 \\ 33 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 36 \\ 38 \\ \hline \end{array}$ |  | 44 | $\begin{aligned} & 21 \\ & 51 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 58 \\ 57 \\ \hline \end{array}$ | $\begin{array}{r} 17 \\ \hline 6 \end{array}$ |  |
| 14 |  | 12 | $\begin{array}{\|l\|} \hline 40 \\ 54 \\ \hline \end{array}$ | $\begin{aligned} & 53 \\ & 16 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 53 \\ 52 \\ \hline \end{array}$ |  | 6 | $\begin{aligned} & \mathbf{4 1} \\ & 53 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline \mathbf{1 8} \\ 43 \\ \hline \end{array}$ | $\begin{array}{\|l} 12 \\ 14 \\ \hline \end{array}$ | 32 | 0 | $\begin{array}{\|r} 7 \\ 53 \\ \hline \end{array}$ | $\begin{array}{r} 35 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline \mathbf{3 1} \\ 37 \\ \hline \end{array}$ |  | 52 | $\begin{aligned} & 58 \\ & 5^{2} \\ & \hline \end{aligned}$ | $\begin{aligned} & 47 \\ & 33 \\ & \hline \end{aligned}$ | $\begin{array}{r} 14 \\ 1 \end{array}$ |  | 45 | $\begin{array}{\|l\|} \hline 13 \\ 51 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 55 \\ 56 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 23 \\ 29 \\ \hline \end{array}$ |  |
| 15 |  | 13 | $\begin{aligned} & 35 \\ & 54 \\ & \hline \end{aligned}$ | $\begin{aligned} & \hline 10 \\ & 16 \\ & \hline \end{aligned}$ | $\begin{aligned} & 45 \\ & 18 \end{aligned}$ |  | 7 | $\begin{aligned} & 35 \\ & 53 \end{aligned}$ | $\begin{array}{r} 1 \\ 4^{2} \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 26 \\ 39 \\ \hline \end{array}$ |  | 1 | $\begin{array}{\|r} \mathbf{o} \\ 53 \\ \hline \end{array}$ | $\begin{array}{r} 44 \\ 8 \end{array}$ | $8$ |  | 53 | $\begin{aligned} & 51 \\ & 5^{2} \\ & \hline \end{aligned}$ | $\begin{aligned} & 20 \\ & 32 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 15 \\ 26 \\ \hline \end{array}$ |  | 46 | $\begin{array}{r} 5 \\ 51 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline \mathbf{5 1} \\ 55 \\ \hline \end{array}$ | $\begin{array}{\|l} 52 \\ 51 \\ \hline \end{array}$ |  |
| 16 |  | 14 | $\begin{aligned} & 29 \\ & 54 \\ & \hline \end{aligned}$ | $\begin{aligned} & \mathbf{2 7} \\ & 15 \\ & \hline \end{aligned}$ | $\begin{array}{r} 3 \\ 45 \\ \hline \end{array}$ |  | 8 | $\begin{aligned} & \mathbf{2 8} \\ & 53 \end{aligned}$ | $\begin{array}{\|l\|} \hline 44 \\ 42 \\ \hline \end{array}$ | $\begin{aligned} & 5 \\ & 5 \\ & \hline \end{aligned}$ |  | 1 | $\begin{array}{\|l\|} \hline 53 \\ 53 \\ \hline \end{array}$ | $5^{2}$ | $\begin{array}{r} 9 \\ 27 \\ \hline \end{array}$ |  | 54 | $\begin{aligned} & 43 \\ & 5^{2} \\ & \hline \end{aligned}$ | $\begin{aligned} & 5^{2} \\ & 31 \end{aligned}$ | $\begin{array}{\|l\|} \hline \mathbf{4 1} \\ 49 \\ \hline \end{array}$ |  | 46 | $\begin{array}{\|l} \hline 57 \\ 51 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 47 \\ 55 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 43 \\ 15 \\ \hline \end{array}$ | 6 |
| 17 |  | 15 | $\begin{array}{\|l} \hline 23 \\ 54 \\ \hline \end{array}$ | $\begin{aligned} & 4^{2} \\ & 15 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 48 \\ 12 \end{array}$ |  | 9 | $\begin{array}{\|l} \mathbf{2 2} \\ 53 \\ \hline \end{array}$ | $\begin{aligned} & 26 \\ & 41 \\ & \hline \end{aligned}$ | $\begin{aligned} & \hline 10 \\ & 31 \\ & \hline \end{aligned}$ |  | 2 | $\begin{aligned} & 46 \\ & 53 \\ & \hline \end{aligned}$ | $\begin{array}{r} 59 \\ \hline \end{array}$ | $\begin{aligned} & 36 \\ & 51 \end{aligned}$ |  | 55 | $\begin{aligned} & 3^{6} \\ & 5^{2} \end{aligned}$ | $\begin{array}{\|l\|} \hline 24 \\ 31 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 30 \\ 13 \\ \hline \end{array}$ |  | 47 | $\begin{gathered} 49 \\ 51 \end{gathered}$ | $\begin{array}{\|l\|} \hline 42 \\ 54 \\ \hline \end{array}$ | $\begin{aligned} & 58 \\ & 38 \\ & \hline \end{aligned}$ |  |
| 18 |  | 16 | $\begin{array}{\|l\|} \hline \mathbf{1 7} \\ 54 \\ \hline \end{array}$ | $\begin{aligned} & 58 \\ & 14 \\ & \hline \end{aligned}$ | $\begin{array}{r} \mathbf{o} \\ 39 \end{array}$ |  | 10 | $\begin{aligned} & \mathbf{1 6} \\ & 53 \end{aligned}$ | $\begin{array}{r} 7 \\ 40 \\ \hline \end{array}$ | $\begin{array}{\|l} \mathbf{4 1} \\ 57 \\ \hline \end{array}$ |  | 3 | $\begin{aligned} & 40 \\ & 53 \end{aligned}$ | $\begin{aligned} & \hline 6 \\ & 6 \end{aligned}$ | $\begin{aligned} & 27 \\ & 16 \end{aligned}$ |  | 56 | $\begin{aligned} & 28 \\ & 52 \end{aligned}$ | $\begin{aligned} & 55 \\ & 30 \end{aligned}$ | $\begin{array}{\|} 43 \\ 37 \\ \hline \end{array}$ |  | 48 | $\begin{aligned} & 4^{1} \\ & 51 \\ & \hline \end{aligned}$ | $\begin{aligned} & 37 \\ & 54 \\ & \hline \end{aligned}$ | $\begin{gathered} 36 \\ 0 \end{gathered}$ |  |
| 19 |  | 17 | $\begin{array}{\|l\|} \hline 12 \\ 54 \\ \hline \end{array}$ | $\begin{aligned} & 12 \\ & 14 \\ & \hline \end{aligned}$ | $\begin{array}{r} 39 \\ 6 \end{array}$ |  | 11 | $\begin{array}{r} \mathbf{9} \\ 53 \end{array}$ | $\begin{array}{\|l} \hline 4^{8} \\ 40 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 38 \\ 23 \\ \hline \end{array}$ |  | 4 | $\begin{array}{\|l\|} \hline 33 \\ 53 \\ \hline \end{array}$ | $\begin{array}{r} 12 \\ 5 \end{array}$ | $\begin{aligned} & 43 \\ & 41 \\ & \hline \end{aligned}$ |  | 57 | $\begin{aligned} & 21 \\ & 52 \end{aligned}$ | $\begin{aligned} & 26 \\ & 30 \end{aligned}$ | $\begin{array}{r} 20 \\ 1 \end{array}$ |  | 49 | $\begin{array}{\|l\|} \hline 33 \\ 51 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{3 1} \\ & 53 \end{aligned}$ | $\begin{array}{\|l} \hline 36 \\ 24 \\ \hline \end{array}$ |  |
| 20 | 30 | 18 | $\begin{array}{r} \hline 6 \\ 54 \\ \hline \end{array}$ | $\begin{aligned} & 26 \\ & 13 \end{aligned}$ | $\begin{aligned} & 45 \\ & 32 \\ & \hline \end{aligned}$ | 31 | 12 | $\begin{array}{r} 3 \\ 53 \end{array}$ | $\begin{aligned} & 29 \\ & 39 \end{aligned}$ | $\begin{array}{r} \mathbf{1} \\ 49 \\ \hline \end{array}$ | $3^{2}$ | 5 | $\begin{aligned} & \mathbf{2 6} \\ & 53 \end{aligned}$ | $\begin{array}{r} 18 \\ 5 \end{array}$ | $\begin{array}{r} 24 \\ \hline \end{array}$ | $3^{2}$ | 58 | $\begin{array}{\|l} \hline 13 \\ 52 \\ \hline \end{array}$ | $\begin{aligned} & 56 \\ & 29 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \mathbf{2 1} \\ \mathbf{2 5} \\ \hline \end{array}$ | 33 | 50 | $\begin{array}{\|l\|} \hline 25 \\ 51 \\ \hline \end{array}$ | $\begin{aligned} & 25 \\ & 52 \end{aligned}$ | $\begin{array}{r} \mathbf{o} \\ 46 \\ \hline \end{array}$ |  |
| 21 |  | 19 | $\begin{array}{\|r} \mathbf{0} \\ 54 \\ \hline \end{array}$ | $\begin{aligned} & 40 \\ & 12 \end{aligned}$ | $\begin{array}{\|l} \mathbf{1 7} \\ 59 \\ \hline \end{array}$ |  | 12 | $\begin{array}{\|l} 57 \\ 53 \end{array}$ | $\begin{array}{\|r} \hline 8 \\ 39 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 50 \\ 14 \\ \hline \end{array}$ |  | 6 | $\begin{array}{\|l\|} \hline 19 \\ 53 \\ \hline \end{array}$ | $\begin{array}{r} 23 \\ 4 \\ \hline \end{array}$ | $\begin{aligned} & 30 \\ & 30 \end{aligned}$ |  | 59 | $\begin{array}{r} 6 \\ 52 \\ \hline \end{array}$ | $\begin{aligned} & 25 \\ & 28 \end{aligned}$ | $\begin{array}{\|l} \hline 4^{6} \\ 49 \\ \hline \end{array}$ |  | 51 | $\begin{array}{\|l\|} \hline \mathbf{1 7} \\ 51 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 17 \\ 52 \\ \hline \end{array}$ | $\begin{array}{r} 46 \\ \hline \end{array}$ |  |
| 22 |  | 19 | $\begin{array}{\|l\|} \hline 54 \\ 54 \\ \hline \end{array}$ | $\begin{aligned} & 53 \\ & 12 \end{aligned}$ | $\begin{array}{\|l\|} \hline 16 \\ 26 \\ \hline \end{array}$ |  | 13 | $\begin{aligned} & 50 \\ & 53 \end{aligned}$ | $\begin{aligned} & 4^{8} \\ & 3^{8} \\ & \hline \end{aligned}$ | $\begin{array}{r} 4 \\ 40 \\ \hline \end{array}$ |  | 7 | $\begin{array}{\|l} \hline 12 \\ 53 \\ \hline \end{array}$ | $\begin{array}{r} \hline 28 \\ 3 \end{array}$ | $\begin{array}{r} \mathbf{o} \\ 5^{6} \end{array}$ |  | 59 | $\begin{aligned} & 5^{8} \\ & 5^{2} \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 54 \\ 28 \end{array}$ | $\begin{array}{\|l\|} \hline 35 \\ 12 \\ \hline \end{array}$ |  | 52 | $\begin{array}{\|r} 9 \\ 51 \\ \hline \end{array}$ | $\begin{array}{\|r} 9 \\ 51 \\ \hline \end{array}$ | $\begin{aligned} & 55 \\ & 32 \\ & \hline \end{aligned}$ |  |
| 23 |  | 20 | $\begin{aligned} & 49 \\ & 54 \\ & \hline \end{aligned}$ | $\begin{array}{r} 5 \\ 11 \end{array}$ | $\begin{aligned} & 42 \\ & 53 \\ & \hline \end{aligned}$ |  | 14 | $\begin{array}{\|l} 44 \\ 53 \\ \hline \end{array}$ | $\begin{aligned} & 26 \\ & 38 \\ & \hline \end{aligned}$ | $\begin{array}{r} 44 \\ 6 \end{array}$ |  | 8 | $\begin{array}{\|r} 5 \\ 53 \\ \hline \end{array}$ | $\begin{array}{r} \mathbf{3 1}^{\mathbf{1}} \\ \hline \end{array}$ | $\begin{aligned} & 56 \\ & 20 \end{aligned}$ | 33 | 0 | $\begin{aligned} & \mathbf{5 1}^{1} \\ & 5^{2} \end{aligned}$ | $\begin{array}{\|l} \mathbf{2 2} \\ \mathbf{2 7} \\ \hline \end{array}$ | $\begin{aligned} & 47 \\ & 36 \\ & \hline \end{aligned}$ |  | 53 | $\begin{array}{\|r} 1 \\ 51 \\ \hline \end{array}$ | $\begin{array}{r} 1 \\ 50 \\ \hline \end{array}$ | $\begin{array}{\|l} 27 \\ 55 \\ \hline \end{array}$ |  |
| 24 |  | 21 | $\begin{aligned} & 43 \\ & 54 \\ & \hline \end{aligned}$ | $\begin{aligned} & \hline 17 \\ & 11 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 35 \\ 19 \\ \hline \end{array}$ |  | 15 | $\begin{aligned} & 38 \\ & 53 \end{aligned}$ | $\begin{array}{r} 4 \\ 37 \\ \hline \end{array}$ | $\begin{aligned} & 50 \\ & 31 \\ & \hline \end{aligned}$ |  | 8 | $\begin{array}{\|l} \hline 58 \\ 53 \\ \hline \end{array}$ | $\begin{array}{r} 35 \\ 2 \end{array}$ | $\begin{aligned} & \mathbf{1 6} \\ & \mathbf{4 5} \\ & \hline \end{aligned}$ |  | 1 | $\begin{aligned} & 43 \\ & 5^{2} \\ & \hline \end{aligned}$ | $\begin{aligned} & 50 \\ & 27 \\ & \hline \end{aligned}$ | $\begin{array}{r} 23 \\ 1 \end{array}$ |  | 53 | $\begin{aligned} & \mathbf{5 2}^{2} \\ & 5^{1} \\ & \hline \end{aligned}$ | $\begin{aligned} & \hline \mathbf{5 2}^{2} \\ & 50 \\ & \hline \end{aligned}$ | $\begin{aligned} & 22 \\ & 18 \end{aligned}$ |  |
| 25 |  | 22 | $\begin{aligned} & 37 \\ & 54 \\ & \hline \end{aligned}$ | $\begin{aligned} & \hline 28 \\ & 10 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 54 \\ 46 \\ \hline \end{array}$ |  | 16 | $\begin{aligned} & \mathbf{3 1} \\ & 53 \end{aligned}$ | $\begin{aligned} & 42 \\ & 3^{6} \end{aligned}$ | $\begin{aligned} & 21 \\ & 57 \\ & \hline \end{aligned}$ |  | 9 | $\begin{array}{\|l\|} \hline \mathbf{5 1} \\ 53 \\ \hline \end{array}$ | $\begin{array}{r} 38 \\ 2 \end{array}$ | $\begin{aligned} & \mathbf{1} \\ & 9 \\ & \hline \end{aligned}$ |  | 2 | $\begin{aligned} & 3^{6} \\ & 5^{2} \end{aligned}$ | $\begin{aligned} & 17 \\ & 26 \end{aligned}$ | $\begin{array}{\|l\|} \hline 24 \\ 23 \\ \hline \end{array}$ |  | 54 | $\begin{array}{\|l\|} \hline 44 \\ 51 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline \mathbf{4 2} \\ 49 \\ \hline \end{array}$ | $\begin{aligned} & 40 \\ & 40 \\ & \hline \end{aligned}$ | 5 |
| 26 |  | 23 | $\begin{array}{\|l\|} \hline \mathbf{3 1} \\ 54 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 39 \\ 10 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 40 \\ 13 \\ \hline \end{array}$ |  | 17 | $\begin{aligned} & 25 \\ & 53 \end{aligned}$ | $\begin{array}{\|l} \hline 19 \\ 36 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 18 \\ 23 \\ \hline \end{array}$ |  | 10 | $\begin{array}{\|l\|} \hline 44 \\ 53 \\ \hline \end{array}$ | $\begin{array}{r} 40 \\ 10 \end{array}$ | $\begin{aligned} & 10 \\ & 34 \\ & \hline \end{aligned}$ |  | 3 | $\begin{aligned} & 28 \\ & 52 \\ & \hline \end{aligned}$ | $\begin{aligned} & 43 \\ & 25 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 47 \\ 48 \\ \hline \end{array}$ |  | 55 | $\begin{array}{\|c} \hline 36 \\ 51 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 3^{2} \\ 49 \\ \hline \end{array}$ | $\begin{array}{\|r} 20 \\ 3 \\ \hline \end{array}$ |  |
| 27 |  | 24 | $\begin{array}{\|l\|} \hline 25 \\ 54 \\ \hline \end{array}$ | $\begin{array}{r} 49 \\ 9 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 53 \\ 39 \\ \hline \end{array}$ |  | 18 | $\begin{aligned} & 18 \\ & 53 \end{aligned}$ | $\begin{aligned} & 55 \\ & 35 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline \mathbf{4 1} \\ 49 \\ \hline \end{array}$ |  | 11 | $\begin{aligned} & 37 \\ & 53 \\ & \hline \end{aligned}$ | $\begin{array}{r} 41 \\ 0 \end{array}$ | $\begin{aligned} & 44 \\ & 59 \\ & \hline \end{aligned}$ |  | 4 | $\begin{array}{\|l} 21 \\ 5^{2} \\ \hline \end{array}$ | $\begin{array}{\|r} 9 \\ 25 \\ \hline \end{array}$ | $\begin{aligned} & 35 \\ & 11 \end{aligned}$ |  | 56 | $\begin{aligned} & 28 \\ & 51 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 21 \\ 48 \\ \hline \end{array}$ | $\begin{array}{\|l} 23 \\ 26 \end{array}$ | 7 |
| 28 |  | 25 | $\begin{array}{\|l\|} \hline 19 \\ 54 \\ \hline \end{array}$ | $\begin{array}{r} 59 \\ \hline \end{array}$ | $\begin{array}{r} 32 \\ 6 \end{array}$ |  | 19 | $\begin{aligned} & 12 \\ & 53 \\ & \hline \end{aligned}$ | $\begin{aligned} & \mathbf{3 1} \\ & 35 \\ & \hline \end{aligned}$ | $\begin{aligned} & 30 \\ & 14 \\ & \hline \end{aligned}$ |  | 12 | $\begin{aligned} & 30 \\ & 53 \\ & \hline \end{aligned}$ | $\begin{gathered} 42 \\ 0 \end{gathered}$ | $\begin{aligned} & 43 \\ & 24 \end{aligned}$ |  | 5 | $\begin{aligned} & 13 \\ & 5^{2} \\ & \hline \end{aligned}$ | $\begin{aligned} & 34 \\ & 24 \\ & \hline \end{aligned}$ | $\begin{aligned} & 46 \\ & 35 \\ & \hline \end{aligned}$ |  | 57 | $\begin{array}{\|l} \hline 20 \\ 51 \\ \hline \end{array}$ | $\begin{array}{r} 9 \\ 47 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 49 \\ 49 \\ \hline \end{array}$ | 8 |
| 29 |  | 26 | $\begin{array}{\|} \mathbf{1 4} \\ 54 \\ \hline \end{array}$ | $\begin{aligned} & 8 \\ & 8 \end{aligned}$ | $\begin{aligned} & 38 \\ & 33 \\ & \hline \end{aligned}$ |  | 20 | $\begin{array}{r} 6 \\ 53 \end{array}$ | $\begin{array}{r} 6 \\ 34 \\ \hline \end{array}$ | $\begin{array}{\|l} 44 \\ 40 \\ \hline \end{array}$ |  | 13 | $\begin{aligned} & 23 \\ & 52 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 43 \\ 59 \end{array}$ | $\begin{array}{r} 7 \\ 48 \\ \hline \end{array}$ |  | 6 | $\begin{array}{r} 5 \\ 5^{2} \\ \hline \end{array}$ | $\begin{array}{\|l} 59 \\ 23 \\ \hline \end{array}$ | $\begin{array}{r} \mathbf{2 1} \\ 59 \\ \hline \end{array}$ |  | 58 | $\begin{array}{\|l\|} \hline 11 \\ 51 \\ \hline \end{array}$ | $\begin{array}{\|l} 57 \\ 47 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 38 \\ 12 \end{array}$ |  |
| 30 | 30 | 27 | $\begin{array}{\|r\|} \hline 8 \\ 54 \\ \hline \end{array}$ | $\begin{array}{r} 17 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 11 \\ 59 \\ \hline \end{array}$ | 31 | 20 | $\begin{aligned} & 59 \\ & 53 \\ & \hline \end{aligned}$ | $\begin{aligned} & \mathbf{4 1} \\ & 34 \\ & \hline \end{aligned}$ | $\begin{array}{r} 24 \\ \hline 5 \\ \hline \end{array}$ | 32 | 14 | $\begin{aligned} & \hline 16 \\ & 52 \\ & \hline \end{aligned}$ | $\begin{aligned} & \mathbf{4 2} \\ & 59 \\ & \hline \end{aligned}$ | $\begin{aligned} & 55 \\ & 13 \end{aligned}$ | 33 | 6 | $\begin{aligned} & 5^{8} \\ & 5^{2} \end{aligned}$ | $\begin{aligned} & 23 \\ & 23 \\ & \hline \end{aligned}$ | $\begin{aligned} & 20 \\ & 22 \\ & \hline \end{aligned}$ | 33 | 59 | $\begin{array}{r} 3 \\ 51 \\ \hline \end{array}$ | $\begin{aligned} & 44 \\ & 46 \\ & \hline \end{aligned}$ | $\begin{aligned} & 50 \\ & 34 \\ & \hline \end{aligned}$ |  |

Bürgi's 1' sine table (reconstruction, D. Roegel, 2016)

| 1 | $30^{\circ}$ |  |  |  |  | $31^{\circ}$ |  |  |  |  | $32^{\circ}$ |  |  |  |  | $33^{\circ}$ |  |  |  |  | $34^{\circ}$ |  |  |  |  | , |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 30 | 30 | 27 | $\begin{array}{\|r\|} \hline 8 \\ 54 \\ \hline \end{array}$ | $\begin{array}{r} 17 \\ 7 \\ \hline \end{array}$ | $\begin{aligned} & \hline \mathbf{1 1} \\ & 59 \\ & \hline \end{aligned}$ | 31 | 20 | $\begin{aligned} & \mathbf{5 9} \\ & 53 \end{aligned}$ | $\begin{array}{\|l\|} \hline \mathbf{4 1} \\ 34 \\ \hline \end{array}$ | $\begin{array}{r} 24 \\ 5 \end{array}$ | 32 | 14 | $\begin{aligned} & 16 \\ & 52 \\ & \hline \end{aligned}$ | $\begin{aligned} & \mathbf{4 2} \\ & 59 \end{aligned}$ | $\begin{aligned} & 55 \\ & 13 \end{aligned}$ | 33 | 6 | $\begin{aligned} & 5^{8} \\ & 5^{2} \end{aligned}$ | $\begin{aligned} & 23 \\ & 23 \\ & \hline \end{aligned}$ | $\begin{aligned} & 20 \\ & 22 \end{aligned}$ | 33 | 59 | $\begin{array}{r} 3 \\ 5^{1} \end{array}$ | $\begin{array}{\|l\|} \hline 44 \\ 46 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 50 \\ 34 \\ \hline \end{array}$ | 30 |
| 31 |  | 28 | $\begin{array}{\|r} \hline \mathbf{2} \\ 54 \\ \hline \end{array}$ | $\begin{array}{r} 25 \\ \hline \\ \hline \end{array}$ | $\begin{aligned} & 10 \\ & 26 \\ & \hline \end{aligned}$ |  | 21 | $\begin{array}{\|l} 53 \\ 53 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 15 \\ 33 \\ \hline \end{array}$ | $\begin{aligned} & 29 \\ & 31 \\ & \hline \end{aligned}$ |  | 15 | $\begin{array}{r} 9 \\ 5^{2} \\ \hline \end{array}$ | $\begin{aligned} & \hline \mathbf{4 2} \\ & 58 \\ & \hline \end{aligned}$ | $\begin{array}{r} 8 \\ 3^{8} \\ \hline \end{array}$ |  | 7 | 50 <br> 52 <br> 2 | 46 <br> 22 | $\begin{array}{\|l} \hline 42 \\ 46 \\ \hline \end{array}$ |  | 59 | $\begin{array}{\|l\|} \hline 55 \\ 51 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline \mathbf{3 1} \\ \mathbf{4 5} \\ \hline \end{array}$ | $\begin{array}{\|} 24 \\ 57 \\ \hline \end{array}$ | 31 |
| 32 |  | 28 | $\begin{array}{\|l\|} \hline \mathbf{5 6} \\ 54 \\ \hline \end{array}$ | $\begin{array}{r} 32 \\ 6 \end{array}$ | $\begin{array}{\|l\|} \hline 36 \\ 52 \\ \hline \end{array}$ |  | 22 | $\begin{aligned} & 46 \\ & 53 \end{aligned}$ | $\begin{aligned} & 49 \\ & 32 \\ & \hline \end{aligned}$ | $\begin{array}{r} \mathbf{0} \\ 57 \\ \hline \end{array}$ |  | 16 | $\begin{array}{r} 2 \\ 52 \\ \hline \end{array}$ | $\begin{aligned} & 40 \\ & 58 \\ & \hline \end{aligned}$ | $\begin{array}{r} 46 \\ 2 \end{array}$ |  | 8 | $\begin{aligned} & 43 \\ & 52 \\ & \hline \end{aligned}$ | $\begin{array}{r} 9 \\ 22 \end{array}$ | $\begin{array}{\|l\|} \hline 28 \\ 10 \\ \hline \end{array}$ | 34 | 0 | $\begin{array}{\|l\|} \hline 47 \\ 51 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline \mathbf{1 7} \\ \mathbf{4 5} \\ \hline \end{array}$ | $\begin{aligned} & 21 \\ & 20 \end{aligned}$ | $3^{2}$ |
| 33 |  | 29 | $\begin{array}{\|l\|} \hline 50 \\ 54 \\ \hline \end{array}$ | $\begin{array}{r} 39 \\ 6 \end{array}$ | $\begin{aligned} & \hline 28 \\ & 19 \\ & \hline \end{aligned}$ |  | 23 | $\begin{aligned} & 40 \\ & 53 \end{aligned}$ | $\begin{aligned} & 21 \\ & 32 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 57 \\ 22 \end{array}$ |  | 16 | $\begin{aligned} & 55 \\ & 52 \\ & \hline \end{aligned}$ | $\begin{aligned} & 38 \\ & 57 \\ & \hline \end{aligned}$ | $\begin{aligned} & 48 \\ & 27 \\ & \hline \end{aligned}$ |  | 9 | $\begin{aligned} & 35 \\ & 5^{2} \end{aligned}$ | $\begin{aligned} & \mathbf{3 1} \\ & \mathbf{2 1} \end{aligned}$ | $\begin{array}{\|l} \hline 38 \\ 33 \\ \hline \end{array}$ |  | 1 | $\begin{array}{\|l\|} \hline 39 \\ 51 \\ \hline \end{array}$ | $\begin{array}{r} 2 \\ 44 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline \mathbf{4 1}^{1} \\ \mathbf{4}^{2} \\ \hline \end{array}$ | 33 |
| 34 |  | 30 | $\begin{array}{\|l\|} \hline 44 \\ 54 \\ \hline \end{array}$ | $\begin{array}{r} 45 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 47 \\ 46 \\ \hline \end{array}$ |  | 24 | $\begin{aligned} & 33 \\ & 53 \end{aligned}$ | $\begin{array}{\|l\|} \hline 54 \\ 31 \\ \hline \end{array}$ | $\begin{aligned} & 19 \\ & 48 \\ & \hline \end{aligned}$ |  | 17 | $\begin{aligned} & \hline 48 \\ & 5^{2} \\ & \hline \end{aligned}$ | $\begin{aligned} & 36 \\ & 56 \\ & \hline \end{aligned}$ | $\begin{aligned} & 15 \\ & 51 \end{aligned}$ |  | 10 | $\begin{aligned} & 27 \\ & 5^{2} \\ & \hline \end{aligned}$ | $\begin{aligned} & 53 \\ & 20 \end{aligned}$ | $\begin{array}{\|l\|} \hline \mathbf{1 1} \\ 57 \\ \hline \end{array}$ |  | 2 | $\begin{array}{\|l\|} \hline 30 \\ 51 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 47 \\ 44 \\ \hline \end{array}$ | $\begin{array}{r} 23 \\ \hline 5 \\ \hline \end{array}$ | 34 |
| 35 |  | 31 | $\begin{array}{\|l\|} \hline 38 \\ 54 \\ \hline \end{array}$ | $\begin{array}{\|r} \mathbf{5 1} \\ 5 \end{array}$ | $\begin{array}{\|l\|} \hline 33 \\ 12 \end{array}$ |  | 25 | $\begin{array}{\|l} \mathbf{2 7} \\ 53 \end{array}$ | $\begin{aligned} & 26 \\ & 31 \end{aligned}$ | $\begin{array}{r} 7 \\ 13 \\ \hline \end{array}$ |  | 18 | $\begin{aligned} & \mathbf{4 1} \\ & 5^{2} \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 33 \\ 56 \\ \hline \end{array}$ | $\begin{array}{r} 6 \\ 16 \end{array}$ |  | 11 | $\begin{aligned} & 20 \\ & 52 \end{aligned}$ | $\begin{aligned} & 14 \\ & 20 \end{aligned}$ | $\begin{array}{r} 8 \\ 21 \end{array}$ |  | 3 | $\begin{aligned} & 22 \\ & 51 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 31 \\ 43 \\ \hline \end{array}$ | $\begin{aligned} & 28 \\ & 28 \end{aligned}$ | 35 |
| 36 |  | 32 | $\begin{aligned} & \mathbf{3 2} \\ & 54 \\ & \hline \end{aligned}$ | $\begin{array}{r} \hline 56 \\ 4 \\ \hline \end{array}$ | $\begin{aligned} & 45 \\ & 38 \\ & \hline \end{aligned}$ |  | 26 | $\begin{aligned} & 20 \\ & 53 \end{aligned}$ | $\begin{array}{\|l} \hline 57 \\ 30 \\ \hline \end{array}$ | $\begin{aligned} & 20 \\ & 39 \end{aligned}$ |  | 19 | $\begin{aligned} & 34 \\ & 52 \\ & \hline \end{aligned}$ | $\begin{aligned} & 29 \\ & 55 \\ & \hline \end{aligned}$ | $\begin{aligned} & 22 \\ & 41 \\ & \hline \end{aligned}$ |  | 12 | $\begin{aligned} & 12 \\ & 52 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} 34 \\ 19 \end{array}$ | $\begin{array}{\|l} \hline 29 \\ 44 \\ \hline \end{array}$ |  | 4 | $\begin{array}{\|l\|} \hline 14 \\ 51 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 14 \\ 4^{2} \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 56 \\ 51 \\ \hline \end{array}$ | 36 |
| 37 |  | 33 | $\begin{array}{\|l\|} \hline 27 \\ 54 \\ \hline \end{array}$ | $\begin{aligned} & \hline \mathbf{1} \\ & 4 \\ & \hline \end{aligned}$ | $\begin{array}{r} 23 \\ 5 \\ \hline \end{array}$ |  | 27 | $\begin{array}{\|l\|} \hline \mathbf{1 4} \\ 53 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 27 \\ 30 \\ \hline \end{array}$ | $\begin{array}{r} 59 \\ \hline 5 \\ \hline \end{array}$ |  | 20 | $\begin{aligned} & 27 \\ & 52 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 25 \\ 55 \\ \hline \end{array}$ | $\begin{aligned} & 3 \\ & 5 \\ & \hline \end{aligned}$ |  | 13 | $\begin{array}{r} 4 \\ 5^{2} \\ \hline \end{array}$ | $\begin{aligned} & 54 \\ & 19 \end{aligned}$ | $\begin{array}{r} 13 \\ 8 \end{array}$ |  | 5 | $\begin{array}{r} 5 \\ 51 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 57 \\ 42 \\ \hline \end{array}$ | $\begin{array}{\|l} 47 \\ 13 \\ \hline \end{array}$ | 37 |
| $3^{8}$ |  | 34 | $\begin{aligned} & \mathbf{2 1} \\ & 54 \end{aligned}$ | $\begin{aligned} & 5 \\ & 3 \\ & \hline \end{aligned}$ | $\begin{aligned} & 28 \\ & 32 \end{aligned}$ |  | 28 | $\begin{array}{r} 7 \\ 53 \\ \hline \end{array}$ | $\begin{aligned} & 58 \\ & 29 \\ & \hline \end{aligned}$ | $\begin{array}{r} 4 \\ 3^{\circ} \\ \hline \end{array}$ |  | 21 | $\begin{aligned} & 20 \\ & 52 \end{aligned}$ | $\begin{array}{\|l} 20 \\ 54 \\ \hline \end{array}$ | $\begin{array}{r} 8 \\ 30 \end{array}$ |  | 13 | $\begin{aligned} & 57 \\ & 52 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 13 \\ 18 \end{array}$ | $\begin{array}{\|l} 21 \\ 31 \\ \hline \end{array}$ |  | 5 | $\begin{aligned} & 57 \\ & 51 \end{aligned}$ | $\begin{array}{\|l} 40 \\ 41 \\ \hline \end{array}$ | $\begin{array}{r} \mathbf{o} \\ 35 \end{array}$ | $3^{8}$ |
| 39 |  | 35 | $\begin{array}{\|l\|} \mathbf{1 5} \\ 54 \\ \hline \end{array}$ | $\begin{aligned} & 9 \\ & 2 \end{aligned}$ | $\begin{array}{r} \mathbf{o} \\ 58 \end{array}$ |  | 29 | $\begin{array}{r} \mathbf{1} \\ 53 \\ \hline \end{array}$ | $\begin{aligned} & 27 \\ & 28 \end{aligned}$ | $\begin{aligned} & 34 \\ & 55 \end{aligned}$ |  | 22 | $\begin{array}{\|l} 13 \\ 5^{2} \end{array}$ | $\begin{array}{\|l} \mathbf{1 4} \\ 53 \\ \hline \end{array}$ | $\begin{aligned} & 38 \\ & 54 \end{aligned}$ |  | 14 | $\begin{aligned} & 49 \\ & 52 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \mathbf{3 1} \\ \mathbf{1} 7 \\ \hline \end{array}$ | $\begin{array}{\|} \mathbf{5 2} \\ 55 \\ \hline \end{array}$ |  | 6 | $\begin{aligned} & 49 \\ & 51 \end{aligned}$ | $\begin{array}{\|l} 21 \\ 40 \\ \hline \end{array}$ | $\begin{array}{\|l} 35 \\ 58 \\ \hline \end{array}$ | 39 |
| 40 | 30 | 36 | $\begin{array}{\|r\|} \hline 9 \\ 54 \\ \hline \end{array}$ | $\begin{array}{r} 11 \\ 2 \end{array}$ | $\begin{aligned} & 58 \\ & 24 \\ & \hline \end{aligned}$ | 31 | 29 | $\begin{aligned} & 54 \\ & 53 \end{aligned}$ | $\begin{aligned} & 56 \\ & 28 \end{aligned}$ | $\begin{aligned} & 29 \\ & 21 \end{aligned}$ | $3^{2}$ | 23 | $\begin{array}{r} 6 \\ 52 \\ \hline \end{array}$ | $\begin{array}{r} 8 \\ 53 \\ \hline \end{array}$ | $\begin{aligned} & 32 \\ & 18 \end{aligned}$ | 33 | 15 | $\begin{aligned} & \mathbf{4 1} \\ & 52 \end{aligned}$ | $\begin{aligned} & 49 \\ & 17 \end{aligned}$ | $\begin{aligned} & 47 \\ & 18 \end{aligned}$ | 34 | 7 | $\begin{aligned} & \hline \mathbf{4 1} \\ & 51 \\ & \hline \end{aligned}$ | $\begin{array}{r} 2 \\ 40 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 33 \\ 21 \end{array}$ | 40 |
| 41 |  | 37 | $\begin{array}{\|r\|} \hline 3 \\ 54 \\ \hline \end{array}$ | $\begin{array}{\|r\|} \hline 14 \\ 1 \end{array}$ | $\begin{array}{\|l} \hline 22 \\ 51 \\ \hline \end{array}$ |  | 30 | $\begin{aligned} & 48 \\ & 53 \end{aligned}$ | $\begin{array}{\|l\|} \hline 24 \\ 27 \\ \hline \end{array}$ | $\begin{array}{r} 50 \\ 46 \\ \hline \end{array}$ |  | 23 | $\begin{aligned} & 59 \\ & 52 \\ & \hline \end{aligned}$ | $\begin{array}{\|r} 1 \\ 5^{2} \end{array}$ | $\begin{aligned} & 50 \\ & 43 \\ & \hline \end{aligned}$ |  | 16 | $\begin{aligned} & 34 \\ & 5^{2} \\ & \hline \end{aligned}$ | $\begin{array}{r} 7 \\ 16 \end{array}$ | $\begin{array}{r} 5 \\ \hline 4^{2} \\ \hline \end{array}$ |  | 8 | $\begin{aligned} & 32 \\ & 5^{2} \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline \mathbf{4 2} \\ 39 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 54 \\ 43 \\ \hline \end{array}$ | 41 |
| 42 |  | 37 | $\begin{aligned} & 57 \\ & 54 \\ & \hline \end{aligned}$ | $\begin{array}{r} 16 \\ 1 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 13 \\ 17 \\ \hline \end{array}$ |  | 31 | $\begin{aligned} & \mathbf{4 1} \\ & 53 \end{aligned}$ | $\begin{array}{\|l} \hline 52 \\ 27 \\ \hline \end{array}$ | $\begin{aligned} & 36 \\ & 12 \end{aligned}$ |  | 24 | $\begin{aligned} & \mathbf{5 1} \\ & 5^{2} \\ & \hline \end{aligned}$ | $\begin{aligned} & 54 \\ & 52 \\ & \hline \end{aligned}$ | $\begin{array}{r} 33 \\ 8 \end{array}$ |  | 17 | $\begin{aligned} & 26 \\ & 52 \end{aligned}$ | $\begin{aligned} & 23 \\ & 16 \end{aligned}$ | $\begin{array}{r} 47 \\ \hline \end{array}$ |  | 9 | $\begin{aligned} & 24 \\ & 51 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 22 \\ 39 \\ \hline \end{array}$ | $\begin{array}{r} 37 \\ \hline 6 \end{array}$ | 42 |
| 43 |  | 38 | $\begin{array}{\|l\|} \hline \mathbf{5 1} \\ \mathbf{5 4} \\ \hline \end{array}$ | $\begin{array}{r} 17 \\ 0 \end{array}$ | $\begin{array}{\|l\|} \hline 30 \\ 44 \\ \hline \end{array}$ |  | 32 | $\begin{aligned} & 35 \\ & 53 \end{aligned}$ | $\begin{aligned} & 19 \\ & 26 \end{aligned}$ | $\begin{aligned} & 48 \\ & 37 \end{aligned}$ |  | 25 | $\begin{aligned} & 44 \\ & 5^{2} \\ & \hline \end{aligned}$ | $\begin{aligned} & 46 \\ & 51 \\ & \hline \end{aligned}$ | $\begin{aligned} & \mathbf{4 1}^{1} \\ & 3^{2} \end{aligned}$ |  | 18 | $\begin{aligned} & 18 \\ & 5^{2} \end{aligned}$ | $\begin{aligned} & 39 \\ & 15 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 52 \\ 29 \\ \hline \end{array}$ |  | 10 | $\begin{array}{\|l\|} \hline 16 \\ 51 \\ \hline \end{array}$ | $\begin{array}{\|r} \hline \mathbf{1} \\ 3^{8} \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 43 \\ 29 \\ \hline \end{array}$ | 43 |
| 44 |  | 39 | $\begin{aligned} & 45 \\ & 54 \\ & \hline \end{aligned}$ | $\begin{gathered} 18 \\ 0 \end{gathered}$ | $\begin{array}{l\|} \hline 14 \\ 10 \end{array}$ |  | 33 | $\begin{aligned} & \mathbf{2 8} \\ & 53 \end{aligned}$ | $\begin{aligned} & 46 \\ & 26 \\ & \hline \end{aligned}$ | $\begin{array}{r} 25 \\ 2 \\ \hline \end{array}$ |  | 26 | $\begin{array}{r} 37 \\ 52 \\ \hline \end{array}$ | $\begin{aligned} & \hline 3^{8} \\ & 50 \\ & \hline \end{aligned}$ | $\begin{aligned} & 13 \\ & 56 \\ & \hline \end{aligned}$ |  | 19 | $\begin{array}{\|l} 10 \\ 52 \\ \hline \end{array}$ | $\begin{array}{\|l} 55 \\ 14 \\ \hline \end{array}$ | $\begin{array}{r} 21 \\ 52 \\ \hline \end{array}$ |  | 11 | $\begin{array}{r} 7 \\ 51 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 40 \\ 37 \\ \hline \end{array}$ | $\begin{array}{\|l} 12 \\ 51 \\ \hline \end{array}$ | 44 |
| 45 |  | 40 | $\begin{aligned} & 39 \\ & 53 \\ & \hline \end{aligned}$ | $\begin{aligned} & 18 \\ & 59 \end{aligned}$ | $\begin{aligned} & 24 \\ & 36 \end{aligned}$ |  | 34 | $\begin{aligned} & 22 \\ & 53 \end{aligned}$ | $\begin{array}{\|l} 12 \\ 25 \\ \hline \end{array}$ | $\begin{aligned} & 27 \\ & 28 \end{aligned}$ |  | 27 | $\begin{aligned} & 30 \\ & 52 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 29 \\ 50 \\ \hline \end{array}$ | $\begin{array}{r} 9 \\ 21 \\ \hline \end{array}$ |  | 20 | $\begin{array}{r} 3 \\ 5^{2} \\ \hline \end{array}$ | $\begin{aligned} & 10 \\ & 14 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 13 \\ 16 \\ \hline \end{array}$ |  | 11 | $\begin{array}{\|l\|} \hline 59 \\ 51 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 18 \\ 37 \\ \hline \end{array}$ | $\begin{array}{\|r} 3 \\ 13 \\ \hline \end{array}$ | 45 |
| 46 |  | 41 | $\begin{aligned} & 33 \\ & 53 \\ & \hline \end{aligned}$ | $\begin{aligned} & 18 \\ & 59 \\ & \hline \end{aligned}$ | $\begin{aligned} & \hline \mathbf{o} \\ & 3 \\ & \hline \end{aligned}$ |  | 35 | $\begin{aligned} & 15 \\ & 53 \end{aligned}$ | $\begin{array}{\|l} 37 \\ 24 \\ \hline \end{array}$ | $\begin{aligned} & 55 \\ & 53 \end{aligned}$ |  | 28 | $\begin{array}{\|l} 23 \\ 52 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 19 \\ 49 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{3 0} \\ & 45 \end{aligned}$ |  | 20 | $\begin{aligned} & 55 \\ & 52 \\ & \hline \end{aligned}$ | $\begin{aligned} & 24 \\ & 13 \end{aligned}$ | $\begin{aligned} & 29 \\ & 39 \\ & \hline \end{aligned}$ |  | 12 | $\begin{aligned} & 50 \\ & 51 \end{aligned}$ | $\begin{array}{\|l} \hline 55 \\ 36 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 16 \\ 36 \\ \hline \end{array}$ | 46 |
| 47 |  | 42 | $\begin{aligned} & \mathbf{2 7} \\ & 53 \\ & \hline \end{aligned}$ | $\begin{array}{\|c\|} \mathbf{1 7} \\ 58 \\ \hline \end{array}$ | $\begin{array}{r} 3 \\ 29 \\ \hline \end{array}$ |  | 36 | $\begin{array}{r} \mathbf{9} \\ 53 \\ \hline \end{array}$ | $\begin{array}{r} 2 \\ 24 \\ \hline \end{array}$ | $\begin{aligned} & 48 \\ & 19 \end{aligned}$ |  | 29 | $\begin{array}{\|l\|} \hline 16 \\ 52 \\ \hline \end{array}$ | $\begin{array}{r} 9 \\ 49 \\ \hline \end{array}$ | $\begin{array}{r} 15 \\ 9 \\ \hline \end{array}$ |  | 21 | $\begin{aligned} & 47 \\ & 52 \\ & \hline \end{aligned}$ | $\begin{aligned} & 38 \\ & 13 \end{aligned}$ | $\begin{aligned} & 8 \\ & 3 \\ & \hline \end{aligned}$ |  | 13 | $\begin{array}{\|l} \hline 42 \\ 51 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline \mathbf{3 1} \\ 35 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 52 \\ 58 \\ \hline \end{array}$ | 47 |
| 48 |  | 43 | $\begin{aligned} & \mathbf{2 1} \\ & 53 \end{aligned}$ | $\begin{aligned} & 15 \\ & 57 \\ & \hline \end{aligned}$ | $\begin{aligned} & 32 \\ & 55 \end{aligned}$ |  | 37 | $\begin{array}{r} \mathbf{2} \\ 53 \\ \hline \end{array}$ | $\begin{array}{\|l} 27 \\ 23 \\ \hline \end{array}$ | $\begin{array}{\|r} 7 \\ 43 \\ \hline \end{array}$ |  | 30 | $\begin{array}{r} 8 \\ 52 \end{array}$ | $\begin{array}{\|l} \hline 58 \\ 48 \\ \hline \end{array}$ | $\begin{array}{\|} 24 \\ 34 \end{array}$ |  | 22 | $\begin{aligned} & 39 \\ & 52 \end{aligned}$ | $\begin{array}{\|l} 51 \\ 12 \end{array}$ | $\begin{aligned} & \hline 11 \\ & 26 \end{aligned}$ |  | 14 | $\begin{aligned} & 34 \\ & 51 \end{aligned}$ | $\begin{array}{r} 7 \\ 35 \\ \hline \end{array}$ | $\begin{aligned} & 50 \\ & 21 \end{aligned}$ | 48 |
| 49 |  | 44 | $\begin{array}{\|l} 15 \\ 53 \\ \hline \end{array}$ | $\begin{array}{\|l} 13 \\ 57 \\ \hline \end{array}$ | $\begin{aligned} & 27 \\ & 22 \end{aligned}$ |  | 37 | $\begin{aligned} & 55 \\ & 53 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 50 \\ 23 \\ \hline \end{array}$ | $\begin{aligned} & 50 \\ & 10 \end{aligned}$ |  | 31 | $\begin{array}{r} 1 \\ 52 \\ \hline \end{array}$ | $\begin{aligned} & 46 \\ & 47 \\ & \hline \end{aligned}$ | $\begin{aligned} & 58 \\ & 58 \\ & \hline \end{aligned}$ |  | 23 | $\begin{aligned} & 3^{2} \\ & 5^{2} \end{aligned}$ | $\begin{array}{r} 3 \\ 11 \end{array}$ | $\begin{array}{\|l} 37 \\ 49 \\ \hline \end{array}$ |  | 15 | $\begin{array}{\|l\|} \hline 25 \\ 51 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 43 \\ 34 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline \mathbf{1 1} \\ 43 \\ \hline \end{array}$ | 49 |
| 50 | 30 | 45 | $\begin{array}{\|r\|} \hline 9 \\ 53 \\ \hline \end{array}$ | $\begin{aligned} & 10 \\ & 56 \end{aligned}$ | $\begin{array}{\|} 49 \\ 47 \\ \hline \end{array}$ | 31 | 38 | $\begin{aligned} & 49 \\ & 53 \end{aligned}$ | $\begin{aligned} & 14 \\ & 22 \end{aligned}$ | $\begin{array}{r} \mathbf{0} \\ 34 \\ \hline \end{array}$ | $3^{2}$ | 31 | $\begin{aligned} & 54 \\ & 52 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 34 \\ 47 \\ \hline \end{array}$ | $\begin{aligned} & 56 \\ & 23 \end{aligned}$ | 33 | 24 | $\begin{aligned} & 24 \\ & 52 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} 15 \\ 11 \end{array}$ | $\begin{aligned} & 26 \\ & 13 \end{aligned}$ | 34 | 16 | $\begin{array}{\|l} 17 \\ 5^{1} \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline \mathbf{1 7} \\ 34 \\ \hline \end{array}$ | $\begin{array}{r} 54 \\ 6 \end{array}$ | 50 |
| 51 |  | 46 | $\begin{array}{\|r\|} \hline 3 \\ 53 \\ \hline \end{array}$ | $\begin{array}{\|r} 7 \\ 56 \\ \hline \end{array}$ | $\begin{array}{\|l} 36 \\ 15 \\ \hline \end{array}$ |  | 39 | $\begin{array}{\|l} 42 \\ 53 \\ \hline \end{array}$ | $\begin{aligned} & 36 \\ & 22 \end{aligned}$ | $\begin{array}{r} 34 \\ 0 \end{array}$ |  | 32 | $\begin{array}{r} 47 \\ 52 \\ \hline \end{array}$ | $\begin{array}{\|l} 22 \\ 46 \\ \hline \end{array}$ | $\begin{aligned} & 19 \\ & 47 \\ & \hline \end{aligned}$ |  | 25 | $\begin{aligned} & 16 \\ & 5^{2} \end{aligned}$ | $\begin{array}{\|l\|} \hline 26 \\ 10 \\ \hline \end{array}$ | $\begin{array}{\|l} 39 \\ 36 \\ \hline \end{array}$ |  | 17 | $\begin{array}{\|r} 8 \\ 51 \\ \hline \end{array}$ | $\begin{array}{\|l} 5^{2} \\ 33 \\ \hline \end{array}$ | $\begin{array}{r} \mathbf{0} \\ 28 \\ \hline \end{array}$ | 51 |
| 52 |  | 46 | $\begin{array}{\|l\|} \hline 57 \\ 53 \\ \hline \end{array}$ | $\begin{array}{r} 3 \\ 55 \end{array}$ | $\begin{aligned} & \hline 51 \\ & 40 \end{aligned}$ |  | 40 | $\begin{array}{\|l\|} \hline 35 \\ 53 \end{array}$ | $\begin{aligned} & \hline 58 \\ & 21 \end{aligned}$ | $\begin{aligned} & 34 \\ & 25 \\ & \hline \end{aligned}$ |  | 33 | $\begin{aligned} & 40 \\ & 52 \end{aligned}$ | $\begin{array}{r} 9 \\ 46 \end{array}$ | $\begin{array}{r} 6 \\ 11 \end{array}$ |  | 26 | $\begin{array}{r} 8 \\ 52 \end{array}$ | $\begin{array}{r} 37 \\ 9 \end{array}$ | $\begin{aligned} & 15 \\ & 59 \end{aligned}$ |  | 18 | $\begin{array}{r} 0 \\ 51 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 25 \\ 32 \\ \hline \end{array}$ | $\begin{aligned} & 28 \\ & 50 \\ & \hline \end{aligned}$ | 52 |
| 53 |  | 47 | $\begin{array}{\|l\|} \hline 50 \\ 53 \\ \hline \end{array}$ | $\begin{aligned} & 59 \\ & 55 \\ & \hline \end{aligned}$ | $\begin{array}{r} \hline \mathbf{3 1} \\ 7 \\ \hline \end{array}$ |  | 41 | $\begin{aligned} & 29 \\ & 53 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 19 \\ 20 \\ \hline \end{array}$ | $\begin{aligned} & 59 \\ & 50 \\ & \hline \end{aligned}$ |  | 34 | $\begin{aligned} & 32 \\ & 52 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 55 \\ 45 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{1 7} \\ & 35 \\ & \hline \end{aligned}$ |  | 27 | $\begin{array}{r} 0 \\ 52 \\ \hline \end{array}$ | $\begin{array}{r} 47 \\ \hline 9 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 14 \\ 23 \\ \hline \end{array}$ |  | 18 | $\begin{array}{\|l\|} \hline 51 \\ 51 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 58 \\ 3^{2} \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 18 \\ 13 \\ \hline \end{array}$ | 53 |
| 54 |  | 48 | $\begin{aligned} & 44 \\ & 53 \\ & \hline \end{aligned}$ | $\begin{array}{\|} \mathbf{5 4} \\ 54 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 3^{8} \\ 3^{2} \\ \hline \end{array}$ |  | 42 | $\begin{array}{\|l} 22 \\ 53 \\ \hline \end{array}$ | $\begin{aligned} & 40 \\ & 20 \end{aligned}$ | $\begin{aligned} & 49 \\ & 16 \end{aligned}$ |  | 35 | $\begin{aligned} & 25 \\ & 52 \\ & \hline \end{aligned}$ | $\begin{aligned} & 40 \\ & 45 \\ & \hline \end{aligned}$ | $\begin{gathered} 52 \\ 0 \end{gathered}$ |  | 27 | $\begin{aligned} & \mathbf{5}^{2} \\ & 5^{2} \\ & \hline \end{aligned}$ | $\begin{array}{r\|} \hline 56 \\ 8 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 37 \\ 46 \\ \hline \end{array}$ |  | 19 | $\begin{array}{\|l\|} \hline 43 \\ 51 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 30 \\ 31 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline \mathbf{3 1} \\ 35 \\ \hline \end{array}$ | 54 |
| 55 |  | 49 | $\begin{array}{\|l\|} \hline 38 \\ 53 \\ \hline \end{array}$ | $\begin{aligned} & 49 \\ & 53 \end{aligned}$ | $\begin{array}{\|l\|} \hline 10 \\ 59 \\ \hline \end{array}$ |  | 43 | $\begin{aligned} & 16 \\ & 53 \end{aligned}$ | $\begin{array}{\|r} \mathbf{1} \\ 19 \\ \hline \end{array}$ | $\begin{array}{r} 5 \\ 40 \\ \hline \end{array}$ |  | 36 | $\begin{aligned} & 18 \\ & 52 \\ & \hline \end{aligned}$ | $\begin{aligned} & \mathbf{2 5} \\ & 44 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 52 \\ 24 \\ \hline \end{array}$ |  | 28 | $\begin{aligned} & 45 \\ & 5^{2} \end{aligned}$ | $\begin{aligned} & 5 \\ & 8 \end{aligned}$ | $\begin{array}{r} 23 \\ \hline 9 \\ \hline \end{array}$ |  | 20 | $\begin{aligned} & 35 \\ & \hline 51 \\ & \hline \end{aligned}$ | $\begin{array}{r} 2 \\ 30 \\ \hline \end{array}$ | $\begin{array}{\|r} \hline \mathbf{6} \\ 58 \\ \hline \end{array}$ | 55 |
| 56 |  | 50 | $\begin{aligned} & \mathbf{3 2} \\ & 53 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 43 \\ 53 \\ \hline \end{array}$ | $\begin{array}{\|r\|} \hline 9 \\ 26 \\ \hline \end{array}$ |  | 44 | $\begin{array}{r} \mathbf{9} \\ 53 \end{array}$ | $\begin{array}{\|l} \hline 20 \\ 19 \\ \hline \end{array}$ | $\begin{array}{r} 45 \\ 6 \end{array}$ |  | 37 | $\begin{array}{\|l\|} \mathbf{1 1} \\ 52 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline \mathbf{1 0} \\ 43 \\ \hline \end{array}$ | $\begin{aligned} & 16 \\ & 48 \\ & \hline \end{aligned}$ |  | 29 | $\begin{aligned} & 37 \\ & 52 \\ & \hline \end{aligned}$ | $\begin{array}{\|r} 13 \\ 7 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline \mathbf{3 2}^{2} \\ 33 \\ \hline \end{array}$ |  | 21 | $\begin{aligned} & 26 \\ & 51 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 33 \\ 30 \\ \hline \end{array}$ | $\begin{array}{r} 4 \\ 20 \end{array}$ | 56 |
| 57 |  | 51 | $\begin{aligned} & \mathbf{2 6} \\ & 53 \\ & \hline \end{aligned}$ | $\begin{aligned} & 36 \\ & 5^{2} \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 35 \\ 51 \\ \hline \end{array}$ |  | 45 | $\begin{array}{r} \mathbf{2} \\ 53 \\ \hline \end{array}$ | $\begin{aligned} & 39 \\ & 18 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \mathbf{5 1}^{1} \\ 3^{1} \\ \hline \end{array}$ |  | $3^{8}$ | $\begin{array}{r} 3 \\ 5^{2} \\ \hline \end{array}$ | $\begin{array}{\|l} 54 \\ 43 \\ \hline \end{array}$ | $\begin{array}{r} 4 \\ 12 \end{array}$ |  | 30 | $\begin{array}{\|l} 29 \\ 52 \\ \hline \end{array}$ | $\begin{array}{r} 21 \\ 6 \end{array}$ | $\begin{array}{r} 5 \\ 55 \\ \hline \end{array}$ |  | 22 | $\begin{array}{\|l\|} \hline 18 \\ 51 \\ \hline \end{array}$ | $\begin{array}{\|r} 3 \\ 29 \\ \hline \end{array}$ | $\begin{array}{\|l} 24 \\ 4^{2} \\ \hline \end{array}$ | 57 |
| 58 |  | 52 | $\begin{aligned} & 20 \\ & 53 \\ & \hline \end{aligned}$ | $\begin{aligned} & 29 \\ & 52 \\ & \hline \end{aligned}$ | $\begin{aligned} & 26 \\ & 17 \end{aligned}$ |  | 45 | $\begin{aligned} & 55 \\ & 53 \end{aligned}$ | $\begin{array}{\|l\|} \hline 58 \\ 17 \\ \hline \end{array}$ | $\begin{aligned} & 22 \\ & 56 \end{aligned}$ |  | $3^{8}$ | $\begin{aligned} & 56 \\ & 52 \end{aligned}$ | $\begin{array}{\|l} 37 \\ 42 \\ \hline \end{array}$ | $\begin{aligned} & 16 \\ & 37 \end{aligned}$ |  | 31 | $\begin{aligned} & 21 \\ & 52 \\ & \hline \end{aligned}$ | $\begin{array}{r} 28 \\ 6 \end{array}$ | $\begin{array}{r} \mathbf{0} \\ 19 \\ \hline \end{array}$ |  | 23 | $\begin{array}{r} 9 \\ 51 \end{array}$ | $\begin{array}{\|l} 33 \\ 29 \\ \hline \end{array}$ | 6 | 58 |
| 59 |  | 53 | $\begin{array}{\|l\|} \hline 14 \\ 53 \\ \hline \end{array}$ | $\begin{array}{\|l} 21 \\ 51 \\ \hline \end{array}$ | $\begin{array}{\|} 43 \\ 44 \\ \hline \end{array}$ |  | 46 | $\begin{aligned} & 49 \\ & 53 \end{aligned}$ | $\begin{aligned} & 16 \\ & 17 \end{aligned}$ | $\begin{aligned} & 18 \\ & 22 \end{aligned}$ |  | 39 | $\begin{array}{\|l} 49 \\ 52 \\ \hline \end{array}$ | $\begin{array}{\|l} 19 \\ 42 \\ \hline \end{array}$ | $\begin{array}{r} 53 \\ 1 \end{array}$ |  | 32 | $\begin{array}{\|l} 13 \\ 5^{2} \\ \hline \end{array}$ | $\begin{array}{r} 34 \\ 5 \\ \hline \end{array}$ | $\begin{array}{\|} 19 \\ 43 \\ \hline \end{array}$ |  | 24 | $\begin{array}{\|r} 1 \\ 51 \\ \hline \end{array}$ | $\begin{array}{r} 2 \\ 28 \\ \hline \end{array}$ | $\begin{array}{\|l} \mathbf{1 0} \\ \mathbf{2 7} \\ \hline \end{array}$ | 59 |
| 60 | 30 | 54 | $\begin{array}{\|r\|} \hline 8 \\ 53 \\ \hline \end{array}$ | $\begin{aligned} & 13 \\ & 51 \\ & \hline \end{aligned}$ | $\begin{aligned} & 27 \\ & 10 \end{aligned}$ | 31 | 47 | $\begin{aligned} & 42 \\ & 53 \\ & \hline \end{aligned}$ | $\begin{aligned} & 33 \\ & 16 \end{aligned}$ | $\begin{aligned} & 40 \\ & 46 \end{aligned}$ | 32 | 40 | $\begin{array}{r} 42 \\ 5^{2} \\ \hline \end{array}$ | $\begin{array}{\|r} 1 \\ 4^{1} \\ \hline \end{array}$ | $\begin{aligned} & 54 \\ & 25 \\ & \hline \end{aligned}$ | 33 | 33 | $\begin{array}{r} 5 \\ 5^{2} \end{array}$ | $\begin{array}{r} 40 \\ 5 \end{array}$ | $\begin{aligned} & 2 \\ & 5 \\ & \hline \end{aligned}$ | 34 | 24 | $\begin{aligned} & 5^{2} \\ & 51 \\ & \hline \end{aligned}$ | $\begin{aligned} & 30 \\ & 27 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline \mathbf{3 7} \\ 49 \\ \hline \end{array}$ | 60 |

Bürgi's 1' sine table (reconstruction, D. Roegel, 2016)

| , | $35^{\circ}$ |  |  |  |  | $36^{\circ}$ |  |  |  |  | $37^{\circ}$ |  |  |  |  | $38^{\circ}$ |  |  |  |  | $39^{\circ}$ |  |  |  |  | , |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 0 | 34 | 24 | $\begin{aligned} & 52 \\ & 51 \end{aligned}$ | $\begin{array}{\|l\|} \hline \mathbf{3 0} \\ 27 \end{array}$ | $\begin{array}{\|l} 37 \\ 49 \\ \hline \end{array}$ | 35 | 16 | $\begin{array}{r} 1 \\ 5^{0} \\ \hline \end{array}$ | $\begin{aligned} & 3^{6} \\ & 49 \end{aligned}$ | $\begin{aligned} & 5^{2} \\ & 3^{6} \end{aligned}$ | 36 | 6 | $\begin{aligned} & 32 \\ & 50 \\ & \hline \end{aligned}$ | $\begin{array}{r} 2 \\ 10 \\ \hline \end{array}$ | $\begin{aligned} & 42 \\ & 27 \end{aligned}$ | 36 | 56 | $\begin{aligned} & 22 \\ & 49 \\ & \hline \end{aligned}$ | $\begin{aligned} & 52 \\ & 30 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 43 \\ 24 \\ \hline \end{array}$ | 37 | 45 | $\begin{aligned} & 33 \\ & 48 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \mathbf{1 2} \\ 49 \\ \hline \end{array}$ | $\begin{aligned} & \hline 16 \\ & 26 \end{aligned}$ | 0 |
| 1 |  | 25 | $\begin{aligned} & 43 \\ & 51 \\ & \hline \end{aligned}$ | $\begin{aligned} & 58 \\ & 27 \\ & \hline \end{aligned}$ | $\begin{aligned} & 26 \\ & 11 \end{aligned}$ |  | 16 | $\begin{aligned} & 52 \\ & 50 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 26 \\ 48 \\ \hline \end{array}$ | $\begin{aligned} & 28 \\ & 57 \\ & \hline \end{aligned}$ |  | 7 | $\begin{aligned} & 22 \\ & 50 \\ & \hline \end{aligned}$ | $\begin{array}{r} 13 \\ \hline 9 \\ \hline \end{array}$ | $\begin{array}{r} 9 \\ 48 \\ \hline \end{array}$ |  | 57 | $\begin{aligned} & 12 \\ & 49 \end{aligned}$ | $\begin{aligned} & 23 \\ & 29 \\ & \hline \end{aligned}$ | $\begin{array}{r} 7 \\ 43 \\ \hline \end{array}$ |  | 46 | $\begin{array}{\|} 22 \\ 48 \\ \hline \end{array}$ | 1 48 | $\begin{array}{\|l\|} \hline \mathbf{4}^{2} \\ 44 \\ \hline \end{array}$ | 1 |
| 2 |  | 26 | $\begin{aligned} & 35 \\ & 51 \\ & \hline \end{aligned}$ | $\begin{aligned} & 25 \\ & 26 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 37 \\ 33 \\ \hline \end{array}$ |  | 17 | $\begin{aligned} & 43 \\ & 50 \\ & \hline \end{aligned}$ | $\begin{aligned} & 15 \\ & 48 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 25 \\ 19 \\ \hline \end{array}$ |  | 8 | $\begin{array}{\|l\|} \hline 12 \\ 50 \\ \hline \end{array}$ | $\begin{array}{r} 22 \\ \hline 9 \\ \hline \end{array}$ | $\begin{array}{\|r} 57 \\ 8 \end{array}$ |  | 58 | $\begin{array}{r} \mathbf{1} \\ 49 \\ \hline \end{array}$ | $\begin{aligned} & 52 \\ & 29 \\ & \hline \end{aligned}$ | $\begin{array}{r} 50 \\ 2 \end{array}$ |  | 47 | $\begin{aligned} & 10 \\ & 48 \end{aligned}$ | $\begin{array}{\|l\|} \hline 50 \\ 48 \\ \hline \end{array}$ | $\begin{array}{\|c\|} \hline \mathbf{2 6} \\ 3 \\ \hline \end{array}$ | 2 |
| 3 |  | 27 | $\begin{aligned} & 26 \\ & 51 \\ & \hline \end{aligned}$ | $\begin{aligned} & 52 \\ & 25 \\ & 25 \end{aligned}$ | $\begin{array}{\|l} \mathbf{1 0} \\ 56 \\ \hline \end{array}$ |  | 18 | $\begin{aligned} & 34 \\ & 50 \\ & \hline \end{aligned}$ | $\begin{array}{r} 3 \\ 47 \\ \hline \end{array}$ | $\begin{aligned} & 44 \\ & 40 \\ & \hline \end{aligned}$ |  | 9 | $\begin{array}{r} 2 \\ 50 \\ \hline \end{array}$ | $\begin{array}{r} 32 \\ 8 \end{array}$ | $\begin{array}{r} 5 \\ 28 \end{array}$ |  | 58 | $\begin{aligned} & \mathbf{5 1} \\ & 49 \\ & \hline \end{aligned}$ | $\begin{aligned} & \mathbf{2 1} \\ & 28 \end{aligned}$ | $\begin{aligned} & 52 \\ & 22 \end{aligned}$ |  | 47 | $\begin{array}{\|l} 59 \\ 48 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 38 \\ 47 \\ \hline \end{array}$ | $\begin{array}{\|l} 29 \\ 21 \end{array}$ | 3 |
| 4 |  | 28 | $\begin{array}{\|l\|} \hline 18 \\ 51 \\ \hline \end{array}$ | $\begin{aligned} & 18 \\ & 25 \\ & \hline \end{aligned}$ | $\begin{array}{r\|} 6 \\ 18 \end{array}$ |  | 19 | $\begin{aligned} & 24 \\ & 50 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \mathbf{5 1} \\ \mathbf{4 7} \\ \hline \end{array}$ | $\begin{array}{\|c} 24 \\ 1 \end{array}$ |  | 9 | $\begin{aligned} & 52 \\ & 50 \\ & \hline \end{aligned}$ | $\begin{array}{\|r} 40 \\ 7 \\ \hline \end{array}$ | $\begin{array}{\|l} 33 \\ 49 \\ \hline \end{array}$ |  | 59 | $\begin{aligned} & 40 \\ & 49 \\ & \hline \end{aligned}$ | $\begin{aligned} & \mathbf{5 0} \\ & \mathbf{2 7} \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 14 \\ 4^{2} \\ \hline \end{array}$ |  | 48 | $\begin{aligned} & 48 \\ & 48 \end{aligned}$ | $\begin{aligned} & 25 \\ & 46 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 50 \\ 40 \\ \hline \end{array}$ | 4 |
| 5 |  | 29 | $\begin{array}{\|r\|} \hline 9 \\ 51 \\ \hline \end{array}$ | $\begin{aligned} & 43 \\ & 24 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 24 \\ 40 \\ \hline \end{array}$ |  | 20 | $\begin{aligned} & 15 \\ & 50 \end{aligned}$ | $\begin{aligned} & 38 \\ & 46 \end{aligned}$ | $\begin{aligned} & 25 \\ & 22 \end{aligned}$ |  | 10 | $\begin{aligned} & 42 \\ & 50 \\ & \hline \end{aligned}$ | $\begin{array}{r} 48 \\ \hline \\ \hline \end{array}$ | $\begin{array}{r} 22 \\ 9 \end{array}$ | 37 | 0 | $\begin{aligned} & 30 \\ & 49 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline \mathbf{1 7} \\ \mathbf{2} 7 \\ \hline \end{array}$ | $\begin{array}{r} 56 \\ 1 \end{array}$ |  | 49 | $\begin{array}{\|l} 37 \\ 48 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 12 \\ 45 \\ \hline \end{array}$ | $\begin{aligned} & 30 \\ & 58 \\ & \hline \end{aligned}$ | 5 |
| 6 |  | 30 | $\begin{array}{\|r} 1 \\ 51 \\ \hline \end{array}$ | $\begin{array}{\|r\|} \hline 8 \\ 24 \\ \hline \end{array}$ | $\begin{aligned} & 4 \\ & 2 \end{aligned}$ |  | 21 | $\begin{array}{r} 6 \\ 50 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 24 \\ 45 \\ \hline \end{array}$ | $\begin{array}{\|l} 47 \\ 44 \\ \hline \end{array}$ |  | 11 | $\begin{aligned} & 32 \\ & 50 \\ & \hline \end{aligned}$ | $\begin{array}{r} 55 \\ 6 \end{array}$ | $\begin{aligned} & \mathbf{3 1} \\ & \mathbf{3 0}^{\mathbf{0}} \\ & \hline \end{aligned}$ |  | 1 | $\begin{array}{\|l\|} \hline 19 \\ 49 \\ \hline \end{array}$ | $\begin{aligned} & 44 \\ & 26 \end{aligned}$ | $\begin{aligned} & 57 \\ & 20 \\ & \hline \end{aligned}$ |  | 50 | $\begin{aligned} & 25 \\ & 48 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 58 \\ 45 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 28 \\ 17 \\ \hline \end{array}$ | 6 |
| 7 |  | 30 | $\begin{aligned} & 52 \\ & 51 \\ & \hline \end{aligned}$ | $\begin{aligned} & 32 \\ & 23 \end{aligned}$ | $\begin{array}{r\|} 6 \\ 25 \\ \hline \end{array}$ |  | 21 | $\begin{aligned} & 57 \\ & 50 \\ & \hline \end{aligned}$ | $\begin{aligned} & \mathbf{1 0} \\ & 45 \\ & \hline \end{aligned}$ | $\begin{array}{r} 31 \\ 5 \end{array}$ |  | 12 | $\begin{aligned} & 23 \\ & 50 \end{aligned}$ | $\begin{aligned} & 2 \\ & 5 \end{aligned}$ | $\begin{array}{r} 1 \\ 49 \\ \hline \end{array}$ |  | 2 | $\begin{array}{r} 9 \\ 49 \\ \hline \end{array}$ | $\begin{aligned} & 11 \\ & \mathbf{2 5} \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \mathbf{1 7} \\ 39 \\ \hline \end{array}$ |  | 51 | $\begin{aligned} & 14 \\ & 48 \\ & \hline \end{aligned}$ | $\begin{aligned} & 43 \\ & 44 \end{aligned}$ | $\begin{aligned} & 45 \\ & 35 \end{aligned}$ | 7 |
| 8 |  | 31 | $\begin{aligned} & 43 \\ & 51 \\ & \hline \end{aligned}$ | $\begin{aligned} & 55 \\ & 22 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \mathbf{3 1} \\ 46 \\ \hline \end{array}$ |  | 22 | $\begin{aligned} & 47 \\ & 50 \\ & \hline \end{aligned}$ | $\begin{aligned} & 55 \\ & 44 \\ & \hline \end{aligned}$ | $\begin{aligned} & 36 \\ & 26 \end{aligned}$ |  | 13 | $\begin{aligned} & 13 \\ & 50 \\ & \hline \end{aligned}$ | $\begin{aligned} & 7 \\ & 5 \\ & \hline \end{aligned}$ | $\begin{aligned} & 50 \\ & 10 \\ & \hline \end{aligned}$ |  | 2 | $\begin{aligned} & 58 \\ & 49 \\ & \hline \end{aligned}$ | $\begin{aligned} & 36 \\ & 24 \end{aligned}$ | $\begin{aligned} & 56 \\ & 59 \\ & \hline \end{aligned}$ |  | 52 | $\begin{array}{r} 3 \\ 48 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline \mathbf{2 8} \\ 43 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 20 \\ 54 \\ \hline \end{array}$ | 8 |
| 9 |  | 32 | $\begin{aligned} & 35 \\ & 51 \end{aligned}$ | $\begin{aligned} & \hline 18 \\ & 22 \end{aligned}$ | $\begin{array}{r} \mathbf{1 7} \\ 9 \\ \hline \end{array}$ |  | 23 | $\begin{aligned} & 38 \\ & 50 \end{aligned}$ | $\begin{array}{\|l} 40 \\ 43 \end{array}$ | $\begin{array}{\|r} \mathbf{2} \\ 47 \\ \hline \end{array}$ |  | 14 | $\begin{array}{r} 3 \\ 50 \\ \hline \end{array}$ | $\begin{array}{r} 13 \\ 4 \\ \hline \end{array}$ | $\begin{array}{r} \mathbf{0} \\ 3^{1} \\ \hline \end{array}$ |  | 3 | $\begin{array}{\|l\|} \hline 48 \\ 49 \\ \hline \end{array}$ | $\begin{array}{\|r} 1 \\ 24 \\ \hline \end{array}$ | $\begin{array}{\|l} 55 \\ 19 \\ \hline \end{array}$ |  | 52 | $\begin{aligned} & 52 \\ & 48 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} 12 \\ 43 \\ \hline \end{array}$ | $\left(\begin{array}{l} 14 \\ 12 \end{array}\right.$ | 9 |
| 10 | 34 | 33 | $\begin{aligned} & 26 \\ & 51 \\ & \hline \end{aligned}$ | $\begin{aligned} & 40 \\ & 21 \end{aligned}$ | $\begin{aligned} & 26 \\ & 30 \end{aligned}$ | 35 | 24 | $\begin{aligned} & 29 \\ & 50 \end{aligned}$ | $\begin{aligned} & 23 \\ & 43 \\ & \hline \end{aligned}$ | $\begin{array}{r} 49 \\ 9 \end{array}$ | 36 | 14 | $\begin{aligned} & 53 \\ & 50 \\ & \hline \end{aligned}$ | $\begin{array}{\|r} 17 \\ 3 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{3 1} \\ & 50 \end{aligned}$ | 37 | 4 | $\begin{aligned} & 37 \\ & 49 \\ & \hline \end{aligned}$ | $\begin{aligned} & 26 \\ & 23 \end{aligned}$ | $\begin{array}{\|l} \mathbf{1 4} \\ 37 \\ \hline \end{array}$ | 37 | 53 | $\begin{aligned} & 40 \\ & 48 \\ & \hline \end{aligned}$ | $\begin{aligned} & 55 \\ & 42 \\ & \hline \end{aligned}$ | $\begin{aligned} & 26 \\ & 31 \\ & \hline \end{aligned}$ | 10 |
| 11 |  | 34 | $\begin{array}{\|l\|} \hline 18 \\ 51 \\ \hline \end{array}$ | $\begin{array}{r} 1 \\ 20 \\ \hline \end{array}$ | $\begin{aligned} & 56 \\ & 53 \end{aligned}$ |  | 25 | $\begin{aligned} & 20 \\ & 50 \\ & \hline \end{aligned}$ | $\begin{array}{r} 6 \\ 42 \\ \hline \end{array}$ | $\begin{aligned} & 5^{8} \\ & 29 \end{aligned}$ |  | 15 | $\begin{aligned} & 43 \\ & 50 \\ & \hline \end{aligned}$ | $\begin{array}{r} \mathbf{2 1} \\ 3 \end{array}$ | $\begin{array}{\|l\|} 21 \\ 11 \end{array}$ |  | 5 | $\begin{array}{\|l\|} \hline \mathbf{2 6} \\ 49 \\ \hline \end{array}$ | $\begin{array}{\|l} 49 \\ 22 \end{array}$ | $\begin{array}{\|l} \mathbf{5 1} \\ 57 \\ \hline \end{array}$ |  | 54 | $\begin{aligned} & 29 \\ & 48 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} 37 \\ 41 \\ \hline \end{array}$ | $\begin{array}{\|l} 57 \\ 49 \\ \hline \end{array}$ | 11 |
| 12 |  | 35 | $\begin{array}{\|r\|} \hline 9 \\ 51 \\ \hline \end{array}$ | $\begin{aligned} & 22 \\ & 20 \end{aligned}$ | $\begin{array}{\|l} 49 \\ 15 \end{array}$ |  | 26 | $\begin{aligned} & \mathbf{1 0} \\ & 50 \\ & \hline \end{aligned}$ | $\begin{aligned} & 49 \\ & 41 \end{aligned}$ | $\begin{aligned} & 27 \\ & 51 \\ & \hline \end{aligned}$ |  | 16 | $\begin{array}{l\|} 33 \\ 50 \end{array}$ | $\begin{array}{r} 24 \\ 2 \end{array}$ | $\begin{aligned} & 3^{2} \\ & 3^{1} \end{aligned}$ |  | 6 | $\begin{array}{\|l\|} \hline \mathbf{1 6} \\ 49 \\ \hline \end{array}$ | $\begin{aligned} & 12 \\ & 22 \end{aligned}$ | $\begin{aligned} & 48 \\ & 17 \end{aligned}$ |  | 55 | $\begin{aligned} & 18 \\ & 48 \end{aligned}$ | $\begin{aligned} & 19 \\ & 41 \end{aligned}$ | $\begin{array}{r} 46 \\ 7 \end{array}$ | 12 |
| 13 |  | 36 | $\begin{array}{\|r\|} \hline 0 \\ 51 \\ \hline \end{array}$ | $\begin{aligned} & \hline 43 \\ & 19 \\ & \hline \end{aligned}$ | $\begin{array}{r} 4 \\ 37 \\ \hline \end{array}$ |  | 27 | $\begin{array}{r} \mathbf{1} \\ 50 \\ \hline \end{array}$ | $\begin{array}{\|l} \mathbf{3 1} \\ \mathbf{4}^{1} \\ \hline \end{array}$ | $\begin{aligned} & 18 \\ & 12 \end{aligned}$ |  | 17 | $\begin{aligned} & 23 \\ & 50 \\ & \hline \end{aligned}$ | $\begin{array}{r} 27 \\ 1 \end{array}$ | $\begin{array}{\|r\|} \hline 3 \\ 51 \\ \hline \end{array}$ |  | 7 | $\begin{array}{r} 5 \\ 49 \\ \hline \end{array}$ | $\begin{aligned} & 35 \\ & 21 \end{aligned}$ | $\begin{array}{r} 5 \\ 35 \\ \hline \end{array}$ |  | 56 | $\begin{array}{r} 7 \\ 48 \end{array}$ | $\begin{array}{\|r} \hline 0 \\ 40 \\ \hline \end{array}$ | $\begin{aligned} & 53 \\ & 26 \\ & \hline \end{aligned}$ | 13 |
| 14 |  | 36 | $\begin{aligned} & \hline \mathbf{5 2} \\ & 51 \\ & \hline \end{aligned}$ | $\begin{array}{r} 2 \\ 18 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline \mathbf{4 1} \\ 59 \\ \hline \end{array}$ |  | 27 | $\begin{aligned} & \mathbf{5 2} \\ & 50 \\ & \hline \end{aligned}$ | $\begin{aligned} & 12 \\ & 40 \\ & \hline \end{aligned}$ | $\begin{aligned} & \mathbf{3 0} \\ & 33 \end{aligned}$ |  | 18 | $\begin{aligned} & 13 \\ & 50 \\ & \hline \end{aligned}$ | $\begin{array}{r\|} \hline 28 \\ 1 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 54 \\ 11 \\ \hline \end{array}$ |  | 7 | $\begin{aligned} & 54 \\ & 49 \\ & \hline \end{aligned}$ | $\begin{aligned} & 56 \\ & 20 \end{aligned}$ | $\begin{aligned} & 40 \\ & 55 \end{aligned}$ |  | 56 | $\begin{aligned} & 55 \\ & 48 \\ & \hline \end{aligned}$ | $\begin{aligned} & \mathbf{4 1} \\ & 39 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 19 \\ 44 \\ \hline \end{array}$ | 14 |
| 15 |  | 37 | $\begin{aligned} & 43 \\ & 51 \\ & \hline \end{aligned}$ | $\begin{aligned} & \mathbf{2 1} \\ & 18 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 40 \\ 21 \end{array}$ |  | 28 | $\begin{aligned} & 42 \\ & 50 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 53 \\ 39 \\ \hline \end{array}$ | $\begin{array}{r} 3 \\ 54 \\ \hline \end{array}$ |  | 19 | $\begin{array}{r} 3 \\ 50 \\ \hline \end{array}$ | $\begin{array}{r} 30 \\ 0 \end{array}$ | $\begin{array}{r} 5 \\ 3^{2} \\ \hline \end{array}$ |  | 8 | $\begin{aligned} & 44 \\ & 49 \end{aligned}$ | $\begin{aligned} & 17 \\ & 20 \end{aligned}$ | $\begin{aligned} & 35 \\ & 14 \end{aligned}$ |  | 57 | $\begin{aligned} & 44 \\ & 48 \\ & \hline \end{aligned}$ | $\begin{aligned} & \mathbf{2 1} \\ & 39 \end{aligned}$ | $\begin{aligned} & 3 \\ & 3 \\ & \hline \end{aligned}$ | 15 |
| 16 |  | $3^{8}$ | $\begin{aligned} & 34 \\ & 51 \\ & \hline \end{aligned}$ | $\begin{aligned} & 40 \\ & 17 \\ & \hline \end{aligned}$ | $\begin{array}{\|r} \hline \mathbf{1} \\ 43 \\ \hline \end{array}$ |  | 29 | $\begin{aligned} & 33 \\ & 50 \end{aligned}$ | $\begin{aligned} & \mathbf{3 2}^{2} \\ & 39 \\ & \hline \end{aligned}$ | $\begin{aligned} & 57 \\ & 15 \\ & \hline \end{aligned}$ |  | 19 | $\begin{aligned} & 53 \\ & 49 \\ & \hline \end{aligned}$ | $\begin{aligned} & 30 \\ & 59 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 37 \\ 51 \\ \hline \end{array}$ |  | 9 | $\begin{aligned} & 33 \\ & 49 \\ & \hline \end{aligned}$ | $\begin{aligned} & 37 \\ & 19 \\ & \hline \end{aligned}$ | $\begin{array}{\|} 49 \\ 34 \\ \hline \end{array}$ |  | 58 | $\begin{array}{\|l} 33 \\ 48 \\ \hline \end{array}$ | $\begin{array}{r} \mathbf{o} \\ 38 \\ \hline \end{array}$ | 6 21 | 16 |
| 17 |  | 39 | $\begin{array}{\|l\|} \hline 25 \\ 51 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 57 \\ 17 \\ \hline \end{array}$ | $\begin{array}{r} 44 \\ 5 \\ \hline \end{array}$ |  | 30 | $\begin{aligned} & 24 \\ & 50 \\ & \hline \end{aligned}$ | $\begin{aligned} & 12 \\ & 3^{8} \\ & \hline \end{aligned}$ | $\begin{aligned} & 12 \\ & 3^{6} \\ & \hline \end{aligned}$ |  | 20 | $\begin{aligned} & 43 \\ & 49 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 30 \\ 59 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 28 \\ 12 \\ \hline \end{array}$ |  | 10 | $\begin{aligned} & 22 \\ & 49 \end{aligned}$ | $\begin{aligned} & 57 \\ & 18 \\ & \hline \end{aligned}$ | $\begin{aligned} & 23 \\ & 52 \\ & \hline \end{aligned}$ |  | 59 | $\begin{aligned} & 21 \\ & 48 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 38 \\ 37 \\ \hline \end{array}$ | $\begin{array}{\|l} 27 \\ 40 \\ \hline \end{array}$ | 17 |
| 18 |  | 40 | $\begin{array}{\|l\|} \hline 17 \\ 51 \\ \hline \end{array}$ | $\begin{aligned} & 14 \\ & 16 \end{aligned}$ | $\begin{array}{\|l} 49 \\ 27 \\ \hline \end{array}$ |  | 31 | $\begin{aligned} & \mathbf{1 4} \\ & 50 \end{aligned}$ | $\begin{aligned} & 50 \\ & 37 \end{aligned}$ | $\begin{aligned} & 48 \\ & 57 \end{aligned}$ |  | 21 | $\begin{aligned} & 33 \\ & 49 \\ & \hline \end{aligned}$ | $\begin{array}{r} 29 \\ 58 \\ \hline \end{array}$ | $\begin{aligned} & 40 \\ & 32 \end{aligned}$ |  | 11 | $\begin{aligned} & 12 \\ & 49 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 16 \\ 18 \\ \hline \end{array}$ | $\begin{aligned} & 15 \\ & 12 \end{aligned}$ | $3^{8}$ | 0 | $\begin{aligned} & 10 \\ & 48 \end{aligned}$ | $\begin{aligned} & 16 \\ & 36 \end{aligned}$ | $\begin{array}{r} 7 \\ 57 \\ \hline \end{array}$ | 18 |
| 19 |  | 41 | $\begin{array}{\|r\|} \hline 8 \\ 51 \\ \hline \end{array}$ | $\begin{aligned} & \hline \mathbf{3 1} \\ & 15 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline \mathbf{1 6} \\ 49 \\ \hline \end{array}$ |  | 32 | $\begin{array}{r} 5 \\ 50 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{2 8} \\ & 37 \end{aligned}$ | $\begin{aligned} & 45 \\ & 18 \end{aligned}$ |  | 22 | $\begin{aligned} & \hline 23 \\ & 49 \\ & \hline \end{aligned}$ | $\begin{aligned} & \mathbf{2 8} \\ & 57 \end{aligned}$ | $\begin{aligned} & 12 \\ & 52 \\ & \hline \end{aligned}$ |  | 12 | $\begin{array}{r} \mathbf{1} \\ 49 \\ \hline \end{array}$ | $\begin{array}{\|l} 34 \\ 17 \\ \hline \end{array}$ | $\begin{aligned} & 27 \\ & 31 \\ & \hline \end{aligned}$ |  | 0 | $\begin{aligned} & 58 \\ & 48 \end{aligned}$ | $\begin{array}{\|l\|} \hline 53 \\ 36 \\ \hline \end{array}$ | $\begin{array}{r} 4 \\ 16 \\ \hline \end{array}$ | 19 |
| 20 | 34 | 41 | $\begin{array}{\|l} 59 \\ 51 \\ \hline \end{array}$ | $\begin{aligned} & 47 \\ & 15 \\ & \hline \end{aligned}$ | $\begin{array}{r} 5 \\ 10 \end{array}$ | 35 | 32 | $\begin{aligned} & 56 \\ & 50 \end{aligned}$ | $\begin{array}{r} 6 \\ 36 \end{array}$ | $\begin{array}{r} 3 \\ 40 \\ \hline \end{array}$ | 36 | 23 | $\begin{aligned} & 13 \\ & 49 \end{aligned}$ | $\begin{aligned} & \mathbf{2 6} \\ & 57 \end{aligned}$ | $\begin{array}{r} 4 \\ 12 \end{array}$ | 37 | 12 | $\begin{aligned} & 50 \\ & 49 \end{aligned}$ | $\begin{aligned} & \mathbf{5 1} \\ & 16 \end{aligned}$ | $\begin{aligned} & 58 \\ & 50 \end{aligned}$ | $3^{8}$ | 1 | $\begin{array}{\|l} 47 \\ 48 \\ \hline \end{array}$ | $\begin{aligned} & 29 \\ & 35 \end{aligned}$ | $\begin{array}{\|l} 20 \\ 35 \\ \hline \end{array}$ | 20 |
| 21 |  | 42 | $\begin{aligned} & \mathbf{5 1} \\ & 51 \\ & \hline \end{aligned}$ | $\begin{array}{r} \hline 2 \\ 14 \\ \hline \end{array}$ | $\begin{array}{\|l} 15 \\ 33 \\ \hline \end{array}$ |  | 33 | $\begin{aligned} & 4^{6} \\ & 50 \\ & \hline \end{aligned}$ | $\begin{aligned} & 42 \\ & 36 \\ & \hline \end{aligned}$ | $\begin{array}{r} 43 \\ 0 \end{array}$ |  | 24 | $\begin{array}{r} 3 \\ 49 \\ \hline \end{array}$ | $\begin{aligned} & 23 \\ & 56 \\ & \hline \end{aligned}$ | $\begin{aligned} & 16 \\ & 32 \\ & \hline \end{aligned}$ |  | 13 | $\begin{aligned} & 40 \\ & 49 \end{aligned}$ | $\begin{array}{r} 8 \\ 16 \end{array}$ | $\begin{aligned} & 48 \\ & 10 \end{aligned}$ |  | 2 | $\begin{aligned} & 36 \\ & 48 \\ & \hline \end{aligned}$ | $\begin{array}{r} 4 \\ 34 \\ \hline \end{array}$ | $\begin{aligned} & 55 \\ & 52 \\ & \hline \end{aligned}$ | 21 |
| 22 |  | 43 | $\begin{array}{\|l\|} \hline 42 \\ 51 \end{array}$ | $\begin{aligned} & 16 \\ & 13 \\ & \hline \end{aligned}$ | $\begin{aligned} & 48 \\ & 55 \end{aligned}$ |  | 34 | $\begin{aligned} & 37 \\ & 50 \\ & \hline \end{aligned}$ | $\begin{aligned} & \mathbf{1 8} \\ & 35 \end{aligned}$ | $\begin{aligned} & 43 \\ & 21 \end{aligned}$ |  | 24 | $\begin{array}{r} 53 \\ 49 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 19 \\ 55 \end{array}$ | $\begin{aligned} & 48 \\ & 53 \end{aligned}$ |  | 14 | $\begin{aligned} & 29 \\ & 49 \\ & \hline \end{aligned}$ | $\begin{aligned} & 24 \\ & 15 \end{aligned}$ | $\begin{aligned} & 58 \\ & 28 \end{aligned}$ |  | 3 | $\begin{aligned} & 24 \\ & 48 \end{aligned}$ | $\begin{aligned} & 39 \\ & 34 \end{aligned}$ | $\begin{array}{\|l\|} \hline 47 \\ 11 \end{array}$ | 22 |
| 23 |  | 44 | $\begin{array}{\|l\|} \hline 33 \\ 51 \\ \hline \end{array}$ | $\begin{aligned} & 30 \\ & 13 \\ & \hline \end{aligned}$ | $\begin{aligned} & 43 \\ & 17 \\ & \hline \end{aligned}$ |  | 35 | $\begin{aligned} & 27 \\ & 50 \\ & \hline \end{aligned}$ | $\begin{aligned} & 54 \\ & 34 \\ & \hline \end{aligned}$ | $\begin{array}{r} 4 \\ 4^{2} \\ \hline \end{array}$ |  | 25 | $\begin{aligned} & 43 \\ & 49 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 15 \\ 55 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 41 \\ 12 \\ \hline \end{array}$ |  | 15 | $\begin{aligned} & \mathbf{1 8} \\ & \mathbf{4 9} \end{aligned}$ | $\begin{array}{\|l} \hline 40 \\ 14 \\ \hline \end{array}$ | $\begin{aligned} & 26 \\ & 48 \\ & \hline \end{aligned}$ |  | 4 | $\begin{aligned} & 13 \\ & 48 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 13 \\ 33 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 58 \\ 29 \\ \hline \end{array}$ | 23 |
| 24 |  | 45 | $\begin{array}{\|l\|} \hline 24 \\ 51 \\ \hline \end{array}$ | $\begin{aligned} & 44 \\ & 12 \end{aligned}$ | $\begin{array}{r} \mathbf{o} \\ 3^{8} \\ \hline \end{array}$ |  | 36 | $\begin{aligned} & 18 \\ & 50 \\ & \hline \end{aligned}$ | $\begin{aligned} & 28 \\ & 34 \\ & \hline \end{aligned}$ | $\begin{array}{r} 46 \\ 3 \\ \hline \end{array}$ |  | 26 | $\begin{array}{\|l\|} \hline 33 \\ 49 \\ \hline \end{array}$ | $\begin{array}{\|l} 10 \\ 54 \\ \hline \end{array}$ | $\begin{aligned} & 53 \\ & 32 \\ & \hline \end{aligned}$ |  | 16 | $\begin{array}{\|r\|} \hline 7 \\ 49 \\ \hline \end{array}$ | $\begin{aligned} & 55 \\ & 14 \end{aligned}$ | $\begin{array}{\|r\|} \hline 14 \\ \hline \end{array}$ |  | 5 | $\begin{array}{r} \mathbf{1} \\ 48 \\ \hline \end{array}$ | $\begin{aligned} & 47 \\ & 32 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 27 \\ 47 \\ \hline \end{array}$ | 24 |
| 25 |  | 46 | $\begin{aligned} & \hline 15 \\ & 51 \\ & \hline \end{aligned}$ | $\begin{aligned} & \hline 56 \\ & 12 \end{aligned}$ | $\begin{gathered} 38 \\ 0 \end{gathered}$ |  | 37 | $\begin{array}{r} 9 \\ 5^{\circ} \end{array}$ | $\begin{array}{r} \mathbf{2} \\ 33 \\ \hline \end{array}$ | $\begin{aligned} & 49 \\ & 24 \end{aligned}$ |  | 27 | $\begin{aligned} & \hline 23 \\ & 49 \\ & \hline \end{aligned}$ | $\begin{array}{r} 5 \\ 53 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 25 \\ 53 \\ \hline \end{array}$ |  | 16 | $\begin{aligned} & 57 \\ & 49 \\ & \hline \end{aligned}$ | $\begin{array}{r} 9 \\ 13 \end{array}$ | $\begin{aligned} & 21 \\ & 26 \end{aligned}$ |  | 5 | $\begin{aligned} & 50 \\ & 48 \end{aligned}$ | $\begin{aligned} & 20 \\ & 32 \\ & \hline \end{aligned}$ | $\begin{array}{r} 14 \\ \hline \end{array}$ | 25 |
| 26 |  | 47 | $\begin{array}{\|r\|} \hline 7 \\ 51 \\ \hline \end{array}$ | $\begin{array}{r} 8 \\ 11 \end{array}$ | $\begin{aligned} & 38 \\ & 23 \\ & \hline \end{aligned}$ |  | 37 | $\begin{aligned} & 59 \\ & 50 \\ & \hline \end{aligned}$ | $\begin{aligned} & 3^{6} \\ & 3^{2} \end{aligned}$ | $\begin{aligned} & 13 \\ & 4^{6} \\ & \hline \end{aligned}$ |  | 28 | $\begin{aligned} & 12 \\ & 49 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 59 \\ 53 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 18 \\ 12 \\ \hline \end{array}$ |  | 17 | $\begin{aligned} & 46 \\ & 49 \\ & \hline \end{aligned}$ | $\begin{aligned} & 22 \\ & 12 \end{aligned}$ | $\begin{array}{\|l} 47 \\ 45 \\ \hline \end{array}$ |  | 6 | $\begin{aligned} & 38 \\ & 48 \end{aligned}$ | $\begin{aligned} & 52 \\ & 3^{1} \\ & \hline \end{aligned}$ | $\begin{aligned} & 20 \\ & 24 \\ & \hline \end{aligned}$ | 26 |
| 27 |  | 47 | $\begin{aligned} & 58 \\ & 51 \\ & \hline \end{aligned}$ | $\begin{aligned} & 20 \\ & 10 \end{aligned}$ | $\begin{array}{r} \mathbf{1} \\ 44 \\ \hline \end{array}$ |  | $3^{8}$ | $\begin{aligned} & 50 \\ & 50 \\ & \hline \end{aligned}$ | $\begin{array}{r} 8 \\ 32 \\ \hline \end{array}$ | $\begin{array}{\|r} 59 \\ 5 \\ \hline \end{array}$ |  | 29 | $\begin{array}{r} 2 \\ 49 \\ \hline \end{array}$ | $\begin{aligned} & 5^{2} \\ & 52 \\ & \hline \end{aligned}$ | $\begin{array}{l\|} \hline \mathbf{3 0} \\ 33 \\ \hline \end{array}$ |  | 18 | $\begin{aligned} & 35 \\ & 49 \\ & \hline \end{aligned}$ | $\begin{aligned} & 35 \\ & 12 \end{aligned}$ | $32$ |  | 7 | $\begin{aligned} & 27 \\ & 48 \\ & \hline \end{aligned}$ | $\begin{aligned} & 23 \\ & 30 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 44 \\ 42 \\ \hline \end{array}$ | 27 |
| 28 |  | 48 | $\begin{aligned} & 49 \\ & 51 \\ & \hline \end{aligned}$ | $\begin{aligned} & 30 \\ & 10 \end{aligned}$ | $\begin{array}{r} 45 \\ 6 \end{array}$ |  | 39 | $\begin{aligned} & 40 \\ & 50 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \mathbf{4}^{1} \\ 3^{1} \\ \hline \end{array}$ | $\begin{array}{r} 4 \\ 27 \\ \hline \end{array}$ |  | 29 | $\begin{aligned} & \mathbf{5 2} \\ & 49 \\ & \hline \end{aligned}$ | $\begin{aligned} & 45 \\ & 51 \\ & \hline \end{aligned}$ | $\begin{array}{r} 3 \\ 5^{2} \\ \hline \end{array}$ |  | 19 | $\begin{aligned} & 24 \\ & 49 \end{aligned}$ | $\begin{aligned} & 47 \\ & 11 \end{aligned}$ | $\begin{aligned} & 36 \\ & 23 \end{aligned}$ |  | 8 | $\begin{aligned} & 15 \\ & 48 \\ & \hline \end{aligned}$ | $\begin{aligned} & 54 \\ & 30 \\ & \hline \end{aligned}$ | $\begin{gathered} 26 \\ 0 \end{gathered}$ | 28 |
| 29 |  | 49 | $\begin{array}{\|l} 40 \\ 51 \\ \hline \end{array}$ | $\begin{array}{r} 40 \\ 9 \\ \hline \end{array}$ | $\begin{array}{\|l} \mathbf{5 1} \\ \mathbf{2 7} \\ \hline \end{array}$ |  | 40 | $\begin{aligned} & \mathbf{3 1}^{1} \\ & 50 \\ & \hline \end{aligned}$ | $\begin{aligned} & 12 \\ & 30 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 31 \\ 48 \\ \hline \end{array}$ |  | 30 | $\begin{aligned} & 42 \\ & 49 \\ & \hline \end{aligned}$ | $\begin{aligned} & 36 \\ & 5^{1} \end{aligned}$ | $\begin{array}{\|l\|} 55 \\ 12 \end{array}$ |  | 20 | $\begin{aligned} & 13 \\ & 49 \\ & \hline \end{aligned}$ | $\begin{aligned} & \hline 58 \\ & 10 \end{aligned}$ | $\begin{array}{\|l} 59 \\ 42 \\ \hline \end{array}$ |  | 9 | $\begin{array}{r} 4 \\ 48 \\ \hline \end{array}$ | $\begin{array}{\|l} 24 \\ 29 \\ \hline \end{array}$ | $\begin{aligned} & 26 \\ & 18 \end{aligned}$ | 29 |
| 30 | 34 | 50 | $\begin{array}{\|l\|} \hline 31 \\ 51 \\ \hline \end{array}$ | $\begin{array}{r} 50 \\ 8 \end{array}$ | $\begin{aligned} & 18 \\ & 50 \\ & \hline \end{aligned}$ | 35 | 41 | $\begin{aligned} & 21 \\ & 50 \end{aligned}$ | $\begin{aligned} & 43 \\ & 30 \end{aligned}$ | $\begin{array}{r} 19 \\ 9 \\ \hline \end{array}$ | 36 | 31 | $\begin{aligned} & 32 \\ & 49 \\ & \hline \end{aligned}$ | $\begin{aligned} & 28 \\ & 50 \\ & \hline \end{aligned}$ | $\begin{array}{r} 7 \\ 32 \\ \hline \end{array}$ | 37 | 21 | $\begin{array}{r} 3 \\ 49 \\ \hline \end{array}$ | $\begin{array}{r} 9 \\ 10 \\ \hline \end{array}$ | $\begin{array}{r} 41 \\ 2 \end{array}$ | $3^{8}$ | 9 | $\begin{array}{\|l} 52 \\ 48 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 53 \\ 28 \\ \hline \end{array}$ | $\begin{aligned} & 44 \\ & 37 \end{aligned}$ | 30 |

Bürgi's 1' sine table (reconstruction, D. Roegel, 2016)

| , | $35^{\circ}$ |  |  |  |  | $36^{\circ}$ |  |  |  |  | $37^{\circ}$ |  |  |  |  | $38^{\circ}$ |  |  |  |  | $39^{\circ}$ |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 30 | 34 | 50 | $\begin{array}{\|l\|l\|} \hline 31 \\ 51 \\ \hline \end{array}$ | $\begin{array}{r} 50 \\ 8 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 18 \\ 50 \\ \hline \end{array}$ | 35 | 41 | $\begin{aligned} & \mathbf{2 1} \\ & 50 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 43 \\ 30 \\ \hline \end{array}$ | $\begin{array}{r} 19 \\ \hline 9 \\ \hline \end{array}$ | 36 | 31 | $\begin{aligned} & \mathbf{3 2}^{2} \\ & 49 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|l\|} \hline \mathbf{2 8} \\ 50 \\ \hline \end{array}$ | $\begin{array}{r} 7 \\ 3^{2} \\ \hline \end{array}$ | 37 | 21 | $\begin{array}{\|r} 3 \\ 49 \\ \hline \end{array}$ | $\begin{array}{\|r\|} 9 \\ 10 \end{array}$ | $\begin{array}{r} 41 \\ 2 \end{array}$ | 38 | 9 | $\begin{array}{\|l} \hline 52 \\ 48 \\ \hline \end{array}$ | $\begin{aligned} & 53 \\ & 28 \end{aligned}$ | $\begin{array}{\|l\|} \hline 44 \\ 37 \\ \hline \end{array}$ | 30 |
| 31 |  | 51 | $\begin{array}{\|l} 22 \\ 51 \\ \hline \end{array}$ | $\begin{array}{r} 59 \\ 8 \end{array}$ | $\begin{array}{r} 8 \\ 11 \end{array}$ |  | 42 | $\begin{aligned} & 12 \\ & 50 \\ & \hline \end{aligned}$ | $\begin{aligned} & 13 \\ & 29 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 28 \\ 29 \\ \hline \end{array}$ |  | 32 | $\begin{aligned} & \mathbf{2 2} \\ & 49 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline \mathbf{1 8} \\ 49 \\ \hline \end{array}$ | $\begin{aligned} & 39 \\ & 53 \end{aligned}$ |  | 21 | $\begin{aligned} & \mathbf{5 2} \\ & 49 \end{aligned}$ | $\begin{array}{r} 19 \\ \hline 9 \end{array}$ | $43$ |  | 10 | $\begin{array}{\|l\|} \hline \mathbf{4 1} \\ 48 \\ \hline \end{array}$ | $\begin{array}{\|l} 22 \\ 27 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \mathbf{2 1} \\ 54 \\ \hline \end{array}$ | 31 |
| 32 |  | 52 | $\left\lvert\, \begin{aligned} & 14 \\ & 51 \end{aligned}\right.$ | $\begin{aligned} & 7 \\ & 7 \\ & \hline \end{aligned}$ | $\begin{aligned} & \hline 19 \\ & 33 \\ & \hline \end{aligned}$ |  | 43 | $\begin{array}{r} 2 \\ 50 \\ \hline \end{array}$ | $\begin{aligned} & 42 \\ & 28 \end{aligned}$ | $\begin{aligned} & 57 \\ & 50 \\ & \hline \end{aligned}$ |  | 33 | $\begin{array}{\|l\|} \hline 12 \\ 49 \\ \hline \end{array}$ | $\begin{array}{r} 8 \\ 49 \\ \hline \end{array}$ | $\begin{aligned} & 32 \\ & 12 \end{aligned}$ |  | 22 | $\begin{array}{\|l} \hline \mathbf{4 1} \\ \mathbf{4 9} \\ \hline \end{array}$ | $\begin{array}{r} 29 \\ \hline \end{array}$ | $\begin{array}{\|r} \hline \mathbf{3} \\ 39 \\ \hline \end{array}$ |  | 11 | $\begin{aligned} & 29 \\ & 48 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 50 \\ 27 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 15 \\ 13 \\ \hline \end{array}$ | 32 |
| 33 |  | 53 | $\begin{array}{\|r} 5 \\ 51 \\ \hline \end{array}$ | $\begin{array}{r} 14 \\ 6 \end{array}$ | $\begin{aligned} & 52 \\ & 55 \\ & \hline \end{aligned}$ |  | 43 | $\begin{aligned} & 53 \\ & 50 \\ & \hline \end{aligned}$ | $\begin{aligned} & \mathbf{1 1} \\ & \mathbf{2 8} \end{aligned}$ | $\begin{aligned} & 47 \\ & 11 \end{aligned}$ |  | 34 | $\begin{array}{r} 1 \\ 49 \\ \hline \end{array}$ | $\begin{array}{\|l} 57 \\ 48 \\ \hline \end{array}$ | $\begin{aligned} & 44 \\ & 32 \end{aligned}$ |  | 23 | $\begin{aligned} & 30 \\ & 49 \end{aligned}$ | $\begin{array}{\|r} 37 \\ 7 \\ \hline \end{array}$ | $\begin{array}{r} 42 \\ 59 \\ \hline \end{array}$ |  | 12 | $\begin{array}{\|l} \hline 18 \\ 48 \\ \hline \end{array}$ | $\begin{aligned} & 17 \\ & 26 \end{aligned}$ | $\begin{array}{\|l} \hline 28 \\ 31 \\ \hline \end{array}$ | 33 |
| 34 |  | 53 | $\begin{aligned} & 56 \\ & 51 \\ & \hline \end{aligned}$ | $\begin{array}{r} 21 \\ 6 \end{array}$ | $\begin{aligned} & 47 \\ & 16 \end{aligned}$ |  | 44 | $\begin{aligned} & 43 \\ & 50 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 39 \\ 27 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 58 \\ 32 \\ \hline \end{array}$ |  | 34 | $\begin{aligned} & \mathbf{5 1} \\ & \mathbf{4 9} \end{aligned}$ | $\begin{aligned} & 46 \\ & 47 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 16 \\ 52 \\ \hline \end{array}$ |  | 24 | $\begin{array}{\|l} \mathbf{1 9} \\ \mathbf{4 9} \\ \hline \end{array}$ | $\begin{array}{r} 45 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline \mathbf{4 1} \\ \mathbf{1 7} \\ \hline \end{array}$ |  | 13 | $\begin{array}{\|r} \hline 6 \\ 48 \\ \hline \end{array}$ | $\begin{array}{\|l} 43 \\ 25 \\ \hline \end{array}$ | $\begin{array}{\|l} 59 \\ 48 \\ \hline \end{array}$ | 34 |
| 35 |  | 54 | $\begin{aligned} & 47 \\ & 51 \\ & \hline \end{aligned}$ | $\begin{array}{r} 28 \\ 5 \end{array}$ | $\begin{array}{r} 3 \\ 39 \\ \hline \end{array}$ |  | 45 | $\begin{aligned} & 34 \\ & 50 \\ & \hline \end{aligned}$ | $\begin{array}{r} 7 \\ 26 \end{array}$ | $\begin{aligned} & 30 \\ & 53 \\ & \hline \end{aligned}$ |  | 35 | $\begin{array}{\|l} \mathbf{4 1} \\ 49 \end{array}$ | $\begin{array}{\|l} \mathbf{3 4} \\ 47 \\ \hline \end{array}$ | $\begin{array}{r} 8 \\ 11 \end{array}$ |  | 25 | $\begin{array}{r} 8 \\ 49 \\ \hline \end{array}$ | $\begin{array}{r} 52 \\ 6 \end{array}$ | $\begin{aligned} & 58 \\ & 36 \end{aligned}$ |  | 13 | $\begin{aligned} & 55 \\ & 48 \\ & \hline \end{aligned}$ | $\begin{array}{r} 9 \\ 25 \\ \hline \end{array}$ | $\begin{array}{\|r} 47 \\ 7 \end{array}$ | 35 |
| 36 |  | 55 | $\begin{aligned} & 38 \\ & 51 \end{aligned}$ | $33$ | $\begin{array}{\|l\|} \hline 42 \\ 59 \\ \hline \end{array}$ |  | 46 | $\begin{aligned} & 24 \\ & 50 \\ & \hline \end{aligned}$ | $\begin{aligned} & 34 \\ & 26 \end{aligned}$ | $\begin{array}{\|l} 23 \\ 13 \end{array}$ |  | $3^{6}$ | $\begin{array}{\|l} \mathbf{3 1} \\ 49 \end{array}$ | $\begin{aligned} & \mathbf{2 1} \\ & 46 \end{aligned}$ | $\begin{aligned} & 19 \\ & 32 \end{aligned}$ |  | 25 | $\begin{array}{\|l} 57 \\ 49 \\ \hline \end{array}$ | $\begin{array}{\|r} 59 \\ 5 \\ \hline \end{array}$ | $\begin{aligned} & 34 \\ & 56 \end{aligned}$ |  | 14 | $\begin{aligned} & 43 \\ & 48 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 34 \\ 24 \\ \hline \end{array}$ | $\begin{array}{\|l} 54 \\ 25 \\ \hline \end{array}$ | 36 |
| 37 |  | 56 | $\begin{array}{\|l} 29 \\ 51 \\ \hline \end{array}$ | $\begin{array}{r} 3^{8} \\ 4 \\ \hline \end{array}$ | $\begin{aligned} & 41 \\ & 22 \end{aligned}$ |  | 47 | $\begin{aligned} & 15 \\ & 50 \\ & \hline \end{aligned}$ | $\begin{array}{r} \mathbf{0} \\ 25 \\ \hline \end{array}$ | $\begin{aligned} & \hline 36 \\ & 34 \\ & \hline \end{aligned}$ |  | 37 | $\begin{array}{\|l\|} \mathbf{2 1} \\ 49 \end{array}$ | $\begin{array}{r} 7 \\ 45 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{5 1} \\ & 52 \\ & \hline \end{aligned}$ |  | 26 | $\begin{array}{\|l} 47 \\ 49 \\ \hline \end{array}$ | $\begin{aligned} & 5 \\ & 5 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 30 \\ 14 \\ \hline \end{array}$ |  | 15 | $\begin{array}{\|l\|} \hline \mathbf{3 1} \\ 48 \\ \hline \end{array}$ | $\begin{array}{\|l} 59 \\ 23 \\ \hline \end{array}$ | $\begin{aligned} & 19 \\ & 44 \end{aligned}$ | 37 |
| $3^{8}$ |  | 57 | $\begin{aligned} & 20 \\ & 51 \end{aligned}$ | $\begin{array}{\|r} 43 \\ 3 \\ \hline \end{array}$ | $\begin{array}{r} 3 \\ 43 \end{array}$ |  | 48 | $\begin{array}{r} 5 \\ 50 \end{array}$ | $\begin{aligned} & 26 \\ & 24 \end{aligned}$ | $\begin{aligned} & \mathbf{1 0} \\ & 55 \end{aligned}$ |  | $3^{8}$ | $\begin{array}{\|l} \mathbf{1 0} \\ 49 \end{array}$ | $\begin{array}{\|l} 53 \\ 45 \\ \hline \end{array}$ | $\begin{aligned} & 43 \\ & 11 \end{aligned}$ |  | 27 | $\begin{aligned} & \hline 36 \\ & 49 \end{aligned}$ | $\begin{array}{r} 10 \\ 4 \end{array}$ | $\begin{array}{\|l} 44 \\ 33 \\ \hline \end{array}$ |  | 16 | $\begin{array}{\|l} 20 \\ 48 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 23 \\ 23 \\ \hline \end{array}$ | 3 <br> 1 | $3^{8}$ |
| 39 |  | 58 | $\begin{aligned} & 11 \\ & 51 \\ & \hline \end{aligned}$ | $\begin{array}{r} 46 \\ 3 \end{array}$ | $\begin{array}{r} 46 \\ 5 \end{array}$ |  | 48 | $\begin{aligned} & 55 \\ & 50 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \mathbf{5 1} \\ \mathbf{2 4} \\ \hline \end{array}$ | $\begin{array}{r} 5 \\ 16 \end{array}$ |  | 39 | $\begin{array}{r} \mathbf{o} \\ 49 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 38 \\ 44 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \mathbf{5 4} \\ 31 \\ \hline \end{array}$ |  | 28 | $\begin{array}{\|l} \mathbf{2 5} \\ 49 \\ \hline \end{array}$ | $15$ | $\begin{array}{\|l} \hline 17 \\ 52 \\ \hline \end{array}$ |  | 17 | $\begin{array}{r} 8 \\ 48 \\ \hline \end{array}$ | $\begin{aligned} & 46 \\ & 22 \end{aligned}$ | 4 19 | 39 |
| 40 | 34 | 59 | $\begin{array}{r} 2 \\ 51 \\ \hline \end{array}$ | $\begin{array}{r} 49 \\ 2 \end{array}$ | $\begin{array}{\|l\|} \hline \mathbf{5 1} \\ \mathbf{2 7} \\ \hline \end{array}$ | 35 | 49 | $\begin{aligned} & 4^{6} \\ & 50 \end{aligned}$ | $\begin{aligned} & 15 \\ & 23 \\ & \hline \end{aligned}$ | $\begin{aligned} & 21 \\ & 36 \\ & \hline \end{aligned}$ | $3^{6}$ | 39 | $\begin{array}{\|l} 50 \\ 49 \\ \hline \end{array}$ | $\begin{array}{\|l} 23 \\ 43 \\ \hline \end{array}$ | $\begin{aligned} & 25 \\ & 51 \end{aligned}$ | 37 | 29 | $\begin{array}{\|l} \mathbf{1 4} \\ 49 \\ \hline \end{array}$ | $\begin{array}{\|r\|} \hline 19 \\ 3 \end{array}$ | $\begin{array}{r} 9 \\ 11 \end{array}$ | $3^{8}$ | 17 | $\begin{array}{\|l} 57 \\ 48 \\ \hline \end{array}$ | $\begin{array}{\|r} 8 \\ 21 \end{array}$ | $\begin{array}{\|l} 23 \\ 37 \\ \hline \end{array}$ | 40 |
| 41 |  | 59 | $\begin{aligned} & 53 \\ & 51 \\ & \hline \end{aligned}$ | $\begin{array}{r} 5^{2} \\ 1 \end{array}$ | $\begin{array}{\|l\|} \hline 18 \\ 48 \\ \hline \end{array}$ |  | 50 | $\begin{aligned} & 3^{6} \\ & 50 \end{aligned}$ | $\begin{aligned} & 38 \\ & 22 \end{aligned}$ | $\begin{array}{\|l} \hline 57 \\ 57 \\ \hline \end{array}$ |  | 40 | $\begin{aligned} & \hline \mathbf{4 0} \\ & 49 \\ & \hline \end{aligned}$ | $\begin{array}{r} 7 \\ 43 \\ \hline \end{array}$ | $\begin{aligned} & 16 \\ & 10 \end{aligned}$ |  | 30 | $\begin{array}{r} \hline 3 \\ 49 \\ \hline \end{array}$ | $\begin{array}{r} 22 \\ 2 \end{array}$ | $\begin{array}{\|l} \hline 20 \\ 30 \\ \hline \end{array}$ |  | 18 | $\begin{array}{\|l} \hline 45 \\ 48 \\ \hline \end{array}$ | $\begin{aligned} & 30 \\ & 20 \end{aligned}$ | 0 | 41 |
| 42 | 35 | 0 | $\begin{aligned} & \hline 44 \\ & 51 \\ & \hline \end{aligned}$ | $\begin{array}{r} 54 \\ 1 \end{array}$ | $\begin{array}{r} 6 \\ 10 \\ \hline \end{array}$ |  | 51 | $\begin{aligned} & 27 \\ & 50 \\ & \hline \end{aligned}$ | $\begin{array}{\|r\|} 1 \\ 22 \end{array}$ | $\begin{aligned} & 54 \\ & 18 \end{aligned}$ |  | 41 | $\begin{array}{r} 29 \\ 49 \\ \hline \end{array}$ | $\begin{aligned} & 50 \\ & 42 \\ & \hline \end{aligned}$ | $\begin{aligned} & 26 \\ & 31 \end{aligned}$ |  | 30 | $\begin{aligned} & \mathbf{5}^{2} \\ & 49 \\ & \hline \end{aligned}$ | $\begin{array}{\|r\|} \hline 24 \\ 1 \end{array}$ | $\begin{array}{\|l} \hline 50 \\ 48 \\ \hline \end{array}$ |  | 19 | $\begin{array}{\|l} \hline 33 \\ 48 \\ \hline \end{array}$ | $\begin{aligned} & 50 \\ & 20 \end{aligned}$ | $\begin{array}{\|l\|} \hline 55 \\ 13 \\ \hline \end{array}$ | 42 |
| 43 |  | 1 | $\begin{aligned} & 35 \\ & 51 \\ & \hline \end{aligned}$ | $\begin{gathered} 55 \\ 0 \end{gathered}$ | $\begin{aligned} & \hline 16 \\ & 31 \\ & \hline \end{aligned}$ |  | 52 | $\begin{aligned} & 17 \\ & 50 \\ & \hline \end{aligned}$ | $24$ | $\begin{array}{\|l} \hline 12 \\ 38 \\ \hline \end{array}$ |  | 42 | $\begin{array}{\|l} 19 \\ 49 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 32 \\ 41 \\ \hline \end{array}$ | $\begin{array}{\|l} 57 \\ 50 \\ \hline \end{array}$ |  | 31 | $\begin{aligned} & \mathbf{4 1} \\ & \mathbf{4 9} \end{aligned}$ | $\begin{gathered} 26 \\ 1 \end{gathered}$ | $\begin{array}{r} 38 \\ 8 \end{array}$ |  | 20 | $\begin{array}{r} 22 \\ 48 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 11 \\ 19 \\ \hline \end{array}$ | 8 31 | 43 |
| 44 |  | 2 | $\begin{aligned} & 26 \\ & 50 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 55 \\ 59 \\ \hline \end{array}$ | $\begin{aligned} & 47 \\ & 53 \\ & \hline \end{aligned}$ |  | 53 | $\begin{array}{r} 7 \\ 5^{\circ} \\ \hline \end{array}$ | $\begin{aligned} & 45 \\ & 20 \\ & \hline \end{aligned}$ | $\begin{aligned} & \hline 50 \\ & 59 \\ & \hline \end{aligned}$ |  | 43 | $\begin{array}{r} 9 \\ 49 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 14 \\ 41 \\ \hline \end{array}$ | $\begin{array}{\|l} 47 \\ 10 \end{array}$ |  | 32 | $\begin{aligned} & 30 \\ & 49 \\ & \hline \end{aligned}$ | $\begin{array}{r} 27 \\ 0 \end{array}$ | $\begin{array}{\|l} \hline 46 \\ 26 \\ \hline \end{array}$ |  | 21 | $\begin{array}{\|l} \hline 10 \\ 48 \\ \hline \end{array}$ | $\begin{aligned} & 30 \\ & 18 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 39 \\ 49 \\ \hline \end{array}$ | 44 |
| 45 |  | 3 | $\begin{aligned} & 17 \\ & 50 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 55 \\ 59 \\ \hline \end{array}$ | $\begin{aligned} & 40 \\ & 14 \end{aligned}$ |  | 53 | $\begin{aligned} & 58 \\ & 50 \\ & \hline \end{aligned}$ | $\begin{array}{\|r\|} \hline 6 \\ 20 \end{array}$ | $\begin{aligned} & 49 \\ & 20 \end{aligned}$ |  | 43 | $\begin{array}{\|l} \hline 58 \\ 49 \\ \hline \end{array}$ | $\begin{array}{\|l} 55 \\ 40 \\ \hline \end{array}$ | $\begin{array}{\|l} 57 \\ 30 \\ \hline \end{array}$ |  | 33 | $\begin{array}{\|l} 19 \\ 48 \\ \hline \end{array}$ | $\begin{aligned} & 28 \\ & 59 \end{aligned}$ | $\begin{array}{\|l} 12 \\ 45 \\ \hline \end{array}$ |  | 21 | $\begin{array}{\|l} \hline 58 \\ 48 \\ \hline \end{array}$ | $\begin{aligned} & 49 \\ & 18 \end{aligned}$ | $\begin{array}{r} 28 \\ \hline 7 \\ \hline \end{array}$ | 45 |
| 46 |  | 4 | $\begin{array}{r} 8 \\ 50 \\ \hline \end{array}$ | $\begin{aligned} & 54 \\ & 58 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 54 \\ 37 \\ \hline \end{array}$ |  | 54 | $\begin{aligned} & 48 \\ & 50 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 27 \\ 19 \\ \hline \end{array}$ | $\begin{array}{r} 9 \\ 40 \\ \hline \end{array}$ |  | 44 | $\begin{aligned} & \hline 48 \\ & 49 \\ & \hline \end{aligned}$ | $\begin{aligned} & 36 \\ & 39 \end{aligned}$ | $\begin{array}{\|l} \mathbf{2 7} \\ 49 \\ \hline \end{array}$ |  | 34 | $\begin{array}{\|r} \hline 8 \\ 4^{8} \\ \hline \end{array}$ | $\begin{array}{\|l} \mathbf{2 7} \\ 59 \\ \hline \end{array}$ | $\begin{array}{r} 57 \\ \hline \end{array}$ |  | 22 | $\begin{array}{\|l} \hline 47 \\ 48 \\ \hline \end{array}$ | $\begin{array}{\|r} 7 \\ 17 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 35 \\ 25 \\ \hline \end{array}$ | 46 |
| 47 |  | 4 | $\begin{array}{\|l} 59 \\ 50 \\ \hline \end{array}$ | $\begin{array}{\|l} 53 \\ 57 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline \mathbf{3 1} \\ 57 \\ \hline \end{array}$ |  | 55 | $\begin{aligned} & 38 \\ & 50 \end{aligned}$ | $\begin{aligned} & 46 \\ & 19 \\ & \hline \end{aligned}$ | $49$ |  | 45 | $\begin{aligned} & 38 \\ & 49 \end{aligned}$ | $\begin{aligned} & \mathbf{1 6} \\ & 39 \end{aligned}$ | $\begin{array}{r} 16 \\ 9 \end{array}$ |  | 34 | $\begin{array}{\|l} 57 \\ 48 \\ \hline \end{array}$ | $\begin{aligned} & 27 \\ & 58 \end{aligned}$ | $\begin{array}{r} 1 \\ 23 \\ \hline \end{array}$ |  | 23 | $\begin{aligned} & 35 \\ & 48 \end{aligned}$ | $\begin{aligned} & 25 \\ & 16 \end{aligned}$ | 0 42 | 47 |
| 48 |  | 5 | $\begin{aligned} & 50 \\ & 50 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \mathbf{5 1} \\ \mathbf{5 7} \\ \hline \end{array}$ | $\begin{aligned} & \hline \mathbf{2 8} \\ & 19 \\ & \hline \end{aligned}$ |  | 56 | $\begin{aligned} & 29 \\ & 50 \\ & \hline \end{aligned}$ | $\begin{array}{r} \mathbf{5} \\ 18 \\ \hline \end{array}$ | $\begin{aligned} & 50 \\ & 22 \end{aligned}$ |  | 46 | $\begin{array}{r} 27 \\ 49 \\ \hline \end{array}$ | $\begin{aligned} & 55 \\ & 38 \end{aligned}$ | $\begin{aligned} & \hline 25 \\ & 29 \\ & \hline \end{aligned}$ |  | 35 | $\begin{aligned} & 4^{6} \\ & 48 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 25 \\ 57 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 24 \\ 41 \\ \hline \end{array}$ |  | 24 | $\begin{array}{\|l} \hline 23 \\ 48 \\ \hline \end{array}$ | $\begin{aligned} & \hline \mathbf{4 1} \\ & 16 \end{aligned}$ | $\begin{array}{r} 42 \\ 1 \end{array}$ | 48 |
| 49 |  | 6 | $\begin{aligned} & 41 \\ & 50 \end{aligned}$ | $\begin{aligned} & 48 \\ & 56 \end{aligned}$ | $\begin{aligned} & 47 \\ & 41 \end{aligned}$ |  | 57 | $\begin{aligned} & 19 \\ & 50 \end{aligned}$ | $\begin{aligned} & 24 \\ & 17 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 12 \\ 42 \\ \hline \end{array}$ |  | 47 | $\begin{aligned} & \mathbf{1 7} \\ & \mathbf{4 9} \end{aligned}$ | $\begin{array}{\|l} 33 \\ 37 \end{array}$ | $\begin{array}{\|l} 54 \\ 48 \\ \hline \end{array}$ |  | $3^{6}$ | $\begin{aligned} & 35 \\ & 48 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 23 \\ 57 \end{array}$ | $\begin{aligned} & 5 \\ & 0 \end{aligned}$ |  | 25 | $\begin{array}{\|l\|} \mathbf{1 1} \\ 48 \\ \hline \end{array}$ | $\begin{array}{\|l} 57 \\ 15 \end{array}$ | $\begin{array}{\|l} 43 \\ 18 \end{array}$ | 49 |
| 50 | 35 | 7 | $\begin{aligned} & 32 \\ & 50 \\ & \hline \end{aligned}$ | $\begin{aligned} & 45 \\ & 56 \\ & \hline \end{aligned}$ | $\begin{array}{\|r\|} \hline 28 \\ 2 \end{array}$ | 35 | 58 | $\begin{array}{r} 9 \\ 50 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{4 1} \\ & \mathbf{1 7} \\ & \hline \end{aligned}$ | $54$ | 36 | 48 | $\begin{array}{r} 7 \\ 49 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 11 \\ 37 \\ \hline \end{array}$ | $\begin{array}{r} 42 \\ 8 \end{array}$ | 37 | 37 | $\begin{array}{\|l} 24 \\ 48 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 20 \\ 56 \\ \hline \end{array}$ | $\begin{array}{\|r} \hline 5 \\ 19 \\ \hline \end{array}$ | $3^{8}$ | 26 | $\begin{array}{r\|r} \hline \mathbf{o} \\ 48 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 13 \\ 14 \\ \hline \end{array}$ | 37 | 50 |
| 51 |  | 8 | $\begin{aligned} & 23 \\ & 50 \end{aligned}$ | $\begin{aligned} & \mathbf{4 1} \\ & \mathbf{5 5} \end{aligned}$ | $\begin{aligned} & 30 \\ & 23 \\ & \hline \end{aligned}$ |  | 58 | $\begin{aligned} & 59 \\ & 50 \\ & \hline \end{aligned}$ | $\begin{aligned} & 58 \\ & 16 \end{aligned}$ | $\begin{aligned} & 56 \\ & 23 \\ & \hline \end{aligned}$ |  | 48 | $\begin{aligned} & 56 \\ & 49 \\ & \hline \end{aligned}$ | $\begin{aligned} & 48 \\ & 36 \end{aligned}$ | $\begin{array}{\|l} 50 \\ 28 \end{array}$ |  | $3^{8}$ | $\begin{array}{\|l} 13 \\ 48 \end{array}$ | $\begin{aligned} & \hline 16 \\ & 55 \end{aligned}$ | $\begin{array}{r} 24 \\ 3^{8} \\ \hline \end{array}$ |  | 26 | $\begin{aligned} & 48 \\ & 48 \end{aligned}$ | $\begin{array}{\|l} 27 \\ 13 \end{array}$ | $\begin{aligned} & 38 \\ & 54 \end{aligned}$ | 51 |
| 52 |  | 9 | $\begin{aligned} & 14 \\ & 50 \end{aligned}$ | $\begin{aligned} & 36 \\ & 54 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 53 \\ 45 \end{array}$ |  | 59 | $\begin{aligned} & 50 \\ & 50 \end{aligned}$ | $\begin{aligned} & 15 \\ & 15 \end{aligned}$ | $\begin{aligned} & 19 \\ & 44 \end{aligned}$ |  | 49 | $\begin{aligned} & 46 \\ & 49 \end{aligned}$ | $\begin{aligned} & 25 \\ & 35 \end{aligned}$ | $\begin{aligned} & \mathbf{1 8} \\ & 47 \end{aligned}$ |  | 39 | $\begin{array}{r} 2 \\ 48 \\ \hline \end{array}$ | $\begin{aligned} & 12 \\ & 54 \\ & \hline \end{aligned}$ | $\begin{array}{r} \mathbf{2} \\ 57 \\ \hline \end{array}$ |  | 27 | $\begin{aligned} & 36 \\ & 48 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline \mathbf{4 1} \\ 13 \\ \hline \end{array}$ | $\begin{aligned} & 32 \\ & 12 \end{aligned}$ | 52 |
| 53 |  | 10 | $\begin{array}{r} 5 \\ 50 \\ \hline \end{array}$ | $\begin{array}{\|l} \mathbf{3 1} \\ 54 \\ \hline \end{array}$ | $\begin{array}{r} 38 \\ 7 \\ \hline \end{array}$ | 36 | 0 | $\begin{aligned} & 40 \\ & 50 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \mathbf{3 1} \\ \mathbf{1 5} \\ \hline \end{array}$ | $3$ |  | 50 | $\begin{aligned} & \mathbf{3}^{6} \\ & 49 \\ & \hline \end{aligned}$ | $\begin{array}{\|r} \mathbf{1} \\ 35 \\ \hline \end{array}$ | $\begin{aligned} & 5 \\ & 7 \\ & \hline \end{aligned}$ |  | 39 | $\begin{aligned} & 51 \\ & 48 \\ & \hline \end{aligned}$ | $\begin{array}{r} 6 \\ 54 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 59 \\ 15 \\ \hline \end{array}$ |  | 28 | $\begin{aligned} & 24 \\ & 48 \end{aligned}$ | $\begin{aligned} & 54 \\ & 12 \end{aligned}$ | $\begin{aligned} & 44 \\ & 30 \end{aligned}$ | 53 |
| 54 |  | 10 | $\begin{aligned} & 56 \\ & 50 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 25 \\ 53 \\ \hline \end{array}$ | $\begin{array}{\|l} 45 \\ 27 \\ \hline \end{array}$ |  | 1 | $\begin{aligned} & 30 \\ & 50 \\ & \hline \end{aligned}$ | $\begin{aligned} & 46 \\ & 14 \\ & \hline \end{aligned}$ | $\begin{array}{r} 7 \\ 25 \\ \hline \end{array}$ |  | 51 | $\begin{aligned} & \mathbf{2 5} \\ & 49 \\ & \hline \end{aligned}$ | $\begin{aligned} & 36 \\ & 34 \\ & \hline \end{aligned}$ | $\begin{aligned} & 12 \\ & 26 \end{aligned}$ |  | 40 | $\begin{aligned} & 40 \\ & 48 \\ & \hline \end{aligned}$ | $\begin{array}{\|r} \hline \mathbf{1} \\ 53 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 14 \\ 33 \\ \hline \end{array}$ |  | 29 | $\begin{array}{\|l} \hline 13 \\ 48 \\ \hline \end{array}$ | $\begin{array}{r} 7 \\ 11 \end{array}$ | $\begin{array}{\|l} \mathbf{1 4} \\ \mathbf{4 7} \\ \hline \end{array}$ | 54 |
| 55 |  | 11 | $\begin{aligned} & 47 \\ & 50 \\ & \hline \end{aligned}$ | $\begin{aligned} & 19 \\ & 52 \end{aligned}$ | $\begin{aligned} & 12 \\ & 50 \\ & \hline \end{aligned}$ |  | 2 | $\begin{aligned} & 21 \\ & 50 \end{aligned}$ | $\begin{array}{\|r} \hline \mathbf{0} \\ 13 \\ \hline \end{array}$ | $\begin{aligned} & 3^{2} \\ & 45 \\ & \hline \end{aligned}$ |  | 52 | $\begin{aligned} & 15 \\ & 49 \\ & \hline \end{aligned}$ | $\begin{aligned} & 10 \\ & 33 \end{aligned}$ | $\begin{aligned} & 38 \\ & 46 \\ & \hline \end{aligned}$ |  | 41 | $\begin{aligned} & 28 \\ & 48 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 54 \\ 52 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 47 \\ 53 \\ \hline \end{array}$ |  | 30 | $\begin{array}{\|r} 18 \\ 48 \\ \hline \end{array}$ | $19$ | 5 | 55 |
| 56 |  | 12 | $\begin{aligned} & 38 \\ & 50 \end{aligned}$ | $\begin{aligned} & 12 \\ & 52 \\ & \hline \end{aligned}$ | $\begin{array}{r} 2 \\ 10 \end{array}$ |  | 3 | $\begin{aligned} & 11 \\ & 50 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 14 \\ 13 \\ \hline \end{array}$ | $\begin{array}{r} 17 \\ \hline 6 \end{array}$ |  | 53 | $\begin{array}{r} 4 \\ 49 \\ \hline \end{array}$ | $\begin{aligned} & 44 \\ & 33 \\ & \hline \end{aligned}$ | $\begin{array}{r} 24 \\ 5 \\ \hline \end{array}$ |  | 42 | $\begin{array}{\|l} \mathbf{1 7} \\ 48 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 47 \\ 52 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 40 \\ 11 \\ \hline \end{array}$ |  | 30 | $\begin{array}{\|l} 49 \\ 48 \\ \hline \end{array}$ | $\begin{aligned} & 30 \\ & 10 \\ & \hline \end{aligned}$ | 6 24 | 56 |
| 57 |  | 13 | $\begin{aligned} & 29 \\ & 50 \\ & \hline \end{aligned}$ | $\begin{array}{r} 4 \\ 51 \\ \hline \end{array}$ | $\begin{aligned} & 12 \\ & 3^{2} \\ & \hline \end{aligned}$ |  | 4 | $\begin{array}{r} 1 \\ 50 \\ \hline \end{array}$ | $\begin{aligned} & 27 \\ & 12 \end{aligned}$ | $\begin{aligned} & 23 \\ & 26 \end{aligned}$ |  | 53 | $\begin{array}{r} 54 \\ 49 \\ \hline \end{array}$ | $\begin{array}{\|l} \mathbf{1 7} \\ \mathbf{3 2} \\ \hline \end{array}$ | $\begin{aligned} & 29 \\ & 26 \end{aligned}$ |  | 43 | $\begin{array}{\|r} \hline 6 \\ 4^{8} \\ \hline \end{array}$ | $\begin{aligned} & 39 \\ & 51 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline \mathbf{5 1} \\ 30 \\ \hline \end{array}$ |  | 31 | $\begin{array}{\|l} 37 \\ 48 \\ \hline \end{array}$ | $\begin{array}{r} 40 \\ \hline 9 \end{array}$ | $\begin{aligned} & 30 \\ & 40 \end{aligned}$ | 57 |
| 58 |  | 14 | $\begin{aligned} & 19 \\ & 50 \\ & \hline \end{aligned}$ | $\begin{aligned} & 55 \\ & 50 \\ & \hline \end{aligned}$ | $\begin{aligned} & 44 \\ & 54 \end{aligned}$ |  | 4 | $\begin{aligned} & \mathbf{5 1} \\ & 50 \\ & \hline \end{aligned}$ | $\begin{aligned} & 39 \\ & 11 \end{aligned}$ | $\begin{aligned} & 49 \\ & 46 \end{aligned}$ |  | 54 | $\begin{aligned} & 43 \\ & 49 \\ & \hline \end{aligned}$ | $\begin{aligned} & 49 \\ & 31 \end{aligned}$ | $\begin{aligned} & 55 \\ & 44 \end{aligned}$ |  | 43 | $\begin{array}{\|l} 55 \\ 48 \\ \hline \end{array}$ | $\begin{aligned} & 31 \\ & 50 \end{aligned}$ | $\begin{array}{\|l} 21 \\ 48 \\ \hline \end{array}$ |  | 32 | $\begin{aligned} & \mathbf{2 5} \\ & 48 \end{aligned}$ | $\begin{array}{r} 50 \\ 8 \end{array}$ | $\begin{array}{\|l} \mathbf{1 0} \\ 59 \\ \hline \end{array}$ | 58 |
| 59 |  | 15 | $\begin{aligned} & 10 \\ & 50 \end{aligned}$ | $\begin{aligned} & 46 \\ & 50 \end{aligned}$ | $\begin{array}{\|l\|} \hline 3^{8} \\ 14 \\ \hline \end{array}$ |  | 5 | $\begin{aligned} & \mathbf{4 1}^{1} \\ & 50 \\ & \hline \end{aligned}$ | $\begin{aligned} & 51 \\ & 11 \end{aligned}$ | $35$ |  | 55 | $\begin{array}{\|l} 33 \\ 49 \end{array}$ | $\begin{array}{\|l\|} \hline 21 \\ 31 \end{array}$ | $\begin{array}{\|r} 39 \\ 4 \end{array}$ |  | 44 | $\begin{array}{\|l\|} \hline 44 \\ 48 \end{array}$ | $\begin{aligned} & 22 \\ & 50 \end{aligned}$ | $\begin{aligned} & 9 \\ & 7 \end{aligned}$ |  | 33 | $\begin{aligned} & 13 \\ & 48 \end{aligned}$ | $\begin{array}{r} 59 \\ 8 \end{array}$ | 9 16 | 59 |
| 60 | 35 | 16 | $\begin{array}{\|r} 1 \\ 50 \\ \hline \end{array}$ | $\begin{aligned} & 36 \\ & 49 \end{aligned}$ | $\begin{aligned} & 5^{2} \\ & 36 \\ & \hline \end{aligned}$ | 36 | 6 | $\begin{aligned} & 3^{2} \\ & 50 \\ & \hline \end{aligned}$ | $\begin{array}{r} 2 \\ 10 \end{array}$ | $\begin{array}{\|l} 42 \\ 27 \\ \hline \end{array}$ | $3^{6}$ | 56 | $\begin{aligned} & 22 \\ & 49 \\ & \hline \end{aligned}$ | $\begin{aligned} & \mathbf{5}^{2} \\ & 30 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 43 \\ 24 \end{array}$ | 37 | 45 | $\begin{array}{\|l} 33 \\ 48 \\ \hline \end{array}$ | $\begin{array}{\|l} \mathbf{1 2} \\ 49 \\ \hline \end{array}$ | $\begin{aligned} & 16 \\ & 26 \end{aligned}$ | $3^{8}$ | 34 | $\begin{array}{r} 2 \\ 48 \\ \hline \end{array}$ | $\begin{aligned} & 7 \\ & 7 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 25 \\ 34 \end{array}$ | 60 |

Bürgi's 1' sine table (reconstruction, D. Roegel, 2016)

| , | $40^{\circ}$ |  |  |  |  | $41^{\circ}$ |  |  |  |  | $42^{\circ}$ |  |  |  |  | $43^{\circ}$ |  |  |  |  | $44^{\circ}$ |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 0 | $3^{8}$ | 34 | $\begin{array}{r} 2 \\ 48 \end{array}$ | $\begin{aligned} & 7 \\ & 7 \\ & \hline \end{aligned}$ | $\begin{aligned} & 25 \\ & 34 \end{aligned}$ | 39 | 21 | $\begin{aligned} & 48 \\ & 47 \end{aligned}$ | $\begin{aligned} & 45 \\ & 24 \end{aligned}$ | $\begin{array}{r} \mathbf{1} \\ 50 \end{array}$ | 40 | 8 | $\begin{aligned} & 52 \\ & 46 \end{aligned}$ | $\begin{aligned} & 12 \\ & 41 \end{aligned}$ | $\begin{aligned} & 40 \\ & 13 \end{aligned}$ | 40 | 55 | $\begin{array}{\|l\|} \hline \mathbf{1 1} \\ 45 \\ \hline \end{array}$ | $\begin{aligned} & 38 \\ & 56 \end{aligned}$ | $\begin{aligned} & 45 \\ & 46 \\ & \hline \end{aligned}$ | 41 | 40 | $\begin{aligned} & 46 \\ & 45 \\ & \hline \end{aligned}$ | $\begin{aligned} & 12 \\ & 11 \end{aligned}$ | $\begin{aligned} & 29 \\ & 28 \end{aligned}$ | 0 |
| 1 |  | 34 | $\begin{aligned} & 50 \\ & 48 \\ & \hline \end{aligned}$ | $\begin{array}{r} 14 \\ 6 \end{array}$ | $\begin{aligned} & 59 \\ & 52 \\ & \hline \end{aligned}$ |  | 22 | $\begin{aligned} & 36 \\ & 47 \\ & \hline \end{aligned}$ | $\begin{array}{r} 9 \\ 24 \\ \hline \end{array}$ | $\begin{array}{r} 51 \\ 6 \end{array}$ |  | 9 | $\begin{aligned} & 38 \\ & 46 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 53 \\ 40 \\ \hline \end{array}$ | $\begin{array}{\|l} 53 \\ 29 \\ \hline \end{array}$ |  | 55 | $\begin{aligned} & 57 \\ & 45 \\ & \hline \end{aligned}$ | $\begin{aligned} & 35 \\ & 56 \end{aligned}$ | $\begin{array}{r} 3^{1} \\ 1 \end{array}$ |  | 41 | $\begin{array}{\|l\|} \hline \mathbf{3 1} \\ 45 \\ \hline \end{array}$ | $\begin{aligned} & 23 \\ & 10 \end{aligned}$ | $\begin{array}{\|l} 57 \\ 42 \end{array}$ | 1 |
| 2 |  | 35 | $\begin{aligned} & \hline 38 \\ & 48 \\ & \hline \end{aligned}$ | $\begin{array}{r} 21 \\ 6 \end{array}$ | $\begin{array}{\|r} \hline \mathbf{5 1} \\ 9 \\ \hline \end{array}$ |  | 23 | $\begin{array}{\|l} 23 \\ 47 \\ \hline \end{array}$ | $\begin{aligned} & 33 \\ & 23 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 57 \\ 23 \\ \hline \end{array}$ |  | 10 | $\begin{array}{\|} 25 \\ 46 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline \mathbf{3 4} \\ 39 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 22 \\ 46 \\ \hline \end{array}$ |  | 56 | $\begin{array}{\|l} 43 \\ 45 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{3 1} \\ & 55 \\ & \hline \end{aligned}$ | $\begin{aligned} & 32 \\ & 16 \\ & \hline \end{aligned}$ |  | 42 | $\begin{array}{\|l\|} \hline 16 \\ 45 \\ \hline \end{array}$ | $\begin{array}{r} 34 \\ \hline 9 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 39 \\ 57 \\ \hline \end{array}$ | 2 |
| 3 |  | 36 | $\begin{aligned} & \hline 26 \\ & 48 \\ & \hline \end{aligned}$ | $\begin{array}{r} 28 \\ \hline 5 \\ \hline \end{array}$ | $\begin{array}{r} \hline \mathbf{o} \\ 27 \\ \hline \end{array}$ |  | 24 | $\begin{array}{\|l} \mathbf{1 0} \\ 47 \\ \hline \end{array}$ | $\begin{aligned} & 57 \\ & 22 \end{aligned}$ | $\begin{array}{\|l} 20 \\ 41 \\ \hline \end{array}$ |  | 11 | $\begin{array}{\|l} 12 \\ 46 \\ \hline \end{array}$ | $\begin{array}{\|l} \mathbf{1 4} \\ 39 \\ \hline \end{array}$ | $8$ |  | 57 | $\begin{array}{\|l} 29 \\ 45 \\ \hline \end{array}$ | $\begin{aligned} & 26 \\ & 54 \\ & \hline \end{aligned}$ | $\begin{aligned} & 48 \\ & 3^{1} \\ & \hline \end{aligned}$ |  | 43 | $\begin{array}{r} 1 \\ 45 \\ \hline \end{array}$ | $\begin{array}{r} 44 \\ 9 \\ \hline \end{array}$ | $\begin{aligned} & 36 \\ & 10 \end{aligned}$ | 3 |
| 4 |  | 37 | $\begin{aligned} & \hline 14 \\ & 48 \\ & \hline \end{aligned}$ | $33$ | $\begin{aligned} & 27 \\ & 45 \end{aligned}$ |  | 24 | $\begin{aligned} & 58 \\ & 47 \\ & \hline \end{aligned}$ | $\begin{aligned} & 20 \\ & 21 \end{aligned}$ | $\begin{array}{\|r} \mathbf{1} \\ 56 \\ \hline \end{array}$ |  | 11 | $\begin{aligned} & 58 \\ & 46 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 53 \\ 38 \\ \hline \end{array}$ | $\begin{array}{\|r} 9 \\ 17 \\ \hline \end{array}$ |  | 58 | $\begin{array}{\|l} 15 \\ 45 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \mathbf{2 1} \\ 53 \\ \hline \end{array}$ | $\begin{aligned} & 19 \\ & 46 \end{aligned}$ |  | 43 | $\begin{aligned} & 46 \\ & 45 \\ & \hline \end{aligned}$ | $\begin{array}{r} 53 \\ 8 \end{array}$ | $\begin{array}{\|l} \hline 46 \\ 25 \\ \hline \end{array}$ | 4 |
| 5 |  | $3^{8}$ | $\begin{array}{r} 2 \\ 48 \\ \hline \end{array}$ | $\begin{array}{r} 3^{8} \\ 4 \end{array}$ | $\begin{array}{r} 12 \\ 3 \\ \hline \end{array}$ |  | 25 | $\begin{array}{\|} 45 \\ 47 \\ \hline \end{array}$ | $\begin{aligned} & 41 \\ & 21 \end{aligned}$ | $\begin{array}{\|l} 57 \\ 14 \\ \hline \end{array}$ |  | 12 | $\begin{aligned} & 45 \\ & 46 \end{aligned}$ | $\begin{array}{\|l} \mathbf{3 1} \\ \mathbf{3 7} \\ \hline \end{array}$ | $\begin{aligned} & 26 \\ & 33 \end{aligned}$ |  | 59 | $\begin{array}{\|r} \mathbf{1} \\ 45 \\ \hline \end{array}$ | $\begin{aligned} & 15 \\ & 53 \end{aligned}$ | $5$ |  | 44 | $\begin{aligned} & 32 \\ & 45 \\ & \hline \end{aligned}$ | $\begin{aligned} & \mathbf{2} \\ & 7 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|l} 11 \\ 40 \\ \hline \end{array}$ | 5 |
| 6 |  | $3^{8}$ | $\begin{aligned} & 50 \\ & 48 \end{aligned}$ | $\begin{array}{r} 42 \\ 3 \end{array}$ | $\begin{aligned} & \hline 15 \\ & 19 \end{aligned}$ |  | 26 | $\begin{array}{\|l} 33 \\ 47 \\ \hline \end{array}$ | $\begin{array}{r} 3 \\ 20 \end{array}$ | $\begin{array}{\|l\|} \hline 11 \\ 3^{1} \\ \hline \end{array}$ |  | 13 | $\begin{aligned} & 32 \\ & 46 \end{aligned}$ | $\begin{array}{r} 8 \\ 36 \end{array}$ | $\begin{array}{\|l} \hline 59 \\ 49 \end{array}$ |  | 59 | $\begin{array}{\|l} 47 \\ 45 \\ \hline \end{array}$ | $\begin{array}{r} 8 \\ 52 \end{array}$ | $\begin{array}{r} 6 \\ 17 \end{array}$ |  | 45 | $\begin{aligned} & 17 \\ & 45 \\ & \hline \end{aligned}$ | $\begin{aligned} & 9 \\ & 6 \end{aligned}$ | $\begin{array}{\|l} \hline \mathbf{5 1} \\ 53 \\ \hline \end{array}$ | 6 |
| 7 |  | 39 | $\begin{aligned} & \hline 38 \\ & 48 \\ & \hline \end{aligned}$ | $\begin{array}{r} 45 \\ 2 \end{array}$ | $\begin{array}{\|l\|} \hline 34 \\ 38 \\ \hline \end{array}$ |  | 27 | $\begin{aligned} & 20 \\ & 47 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 23 \\ 19 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 42 \\ 47 \\ \hline \end{array}$ |  | 14 | $\begin{aligned} & 18 \\ & 46 \end{aligned}$ | $\begin{aligned} & 45 \\ & 36 \\ & \hline \end{aligned}$ | $\begin{array}{r} 48 \\ 5 \end{array}$ | 41 | 0 | $\begin{array}{\|l} 33 \\ 45 \\ \hline \end{array}$ | $\begin{array}{r} 0 \\ 51 \\ \hline \end{array}$ | $\begin{aligned} & 23 \\ & 31 \\ & \hline \end{aligned}$ |  | 46 | $\begin{array}{\|r} \hline 2 \\ 45 \\ \hline \end{array}$ | $\begin{array}{r} 16 \\ \hline 6 \end{array}$ | $\begin{array}{r} 44 \\ 8 \end{array}$ | 7 |
| 8 |  | 40 | $\begin{aligned} & \hline 26 \\ & 48 \end{aligned}$ | $\begin{array}{r} 48 \\ 1 \end{array}$ | $\begin{aligned} & 12 \\ & 55 \\ & \hline \end{aligned}$ |  | 28 | $\begin{array}{r} 7 \\ 47 \end{array}$ | $\begin{array}{\|l} 43 \\ 19 \\ \hline \end{array}$ | $\begin{array}{r} 29 \\ 3 \end{array}$ |  | 15 | $\begin{array}{r} 5 \\ 46 \end{array}$ | $\begin{array}{\|l} \mathbf{2 1} \\ 35 \\ \hline \end{array}$ | $\begin{aligned} & 53 \\ & 20 \end{aligned}$ |  | 1 | $\begin{aligned} & \hline \mathbf{1 8} \\ & 45 \end{aligned}$ | $\begin{aligned} & \mathbf{5 1}^{1} \\ & 50 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 54 \\ 46 \\ \hline \end{array}$ |  | 46 | $\begin{aligned} & 47 \\ & 45 \\ & \hline \end{aligned}$ | $\begin{array}{r} 22 \\ 5 \\ \hline \end{array}$ | $\begin{aligned} & 5^{2} \\ & 22 \end{aligned}$ | 8 |
| 9 |  | 41 | $\begin{aligned} & \hline 14 \\ & 48 \\ & \hline \end{aligned}$ | $\begin{gathered} 50 \\ 1 \end{gathered}$ | $\begin{array}{r} 7 \\ 13 \end{array}$ |  | 28 | $\begin{aligned} & 55 \\ & 47 \end{aligned}$ | $\begin{array}{r} 2 \\ 18 \end{array}$ | $\begin{aligned} & 32 \\ & 21 \end{aligned}$ |  | 15 | $\begin{aligned} & 51 \\ & 46 \end{aligned}$ | $\begin{array}{\|l} \hline \mathbf{5 7} \\ \mathbf{3 4} \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 13 \\ 37 \\ \hline \end{array}$ |  | 2 | $\begin{array}{r} 4 \\ 45 \\ \hline \end{array}$ | $\begin{aligned} & 42 \\ & 50 \end{aligned}$ | $\begin{array}{\|c} 40 \\ 20 \end{array}$ |  | 47 | $\begin{array}{\|l} \hline 32 \\ 45 \\ \hline \end{array}$ | $\begin{array}{r} 28 \\ \hline 4 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 14 \\ 36 \\ \hline \end{array}$ | 9 |
| 10 | $3^{8}$ | 42 | $\begin{array}{r} 2 \\ 48 \\ \hline \end{array}$ | $\begin{gathered} 51 \\ 0 \end{gathered}$ | $\begin{aligned} & 20 \\ & 30 \\ & \hline \end{aligned}$ | 39 | 29 | $\begin{array}{\|l} 42 \\ 47 \\ \hline \end{array}$ | $\begin{array}{\|l} \mathbf{2 0} \\ 17 \\ \hline \end{array}$ | $\begin{array}{\|l} 53 \\ 37 \end{array}$ | 40 | 16 | $\begin{aligned} & 38 \\ & 46 \end{aligned}$ | $\begin{array}{\|l} \mathbf{3 1} \\ 33 \end{array}$ | $\begin{array}{\|l} 50 \\ 52 \\ \hline \end{array}$ | 41 | 2 | $\begin{array}{\|l} 50 \\ 45 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{3 2}^{2} \\ & 49 \\ & \hline \end{aligned}$ | $\begin{aligned} & 42 \\ & 16 \end{aligned}$ | 41 | 48 | $\begin{aligned} & 17 \\ & 45 \\ & \hline \end{aligned}$ | $\begin{array}{r} 32 \\ 3 \end{array}$ | $\begin{array}{\|l} 50 \\ 50 \\ \hline \end{array}$ | 0 |
| 11 |  | 42 | $\begin{aligned} & 50 \\ & 47 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \mathbf{5 1} \\ 59 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 50 \\ 48 \\ \hline \end{array}$ |  | 30 | $\begin{array}{\|} 29 \\ 47 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 38 \\ 16 \end{array}$ | $\begin{array}{\|l} \hline 30 \\ 54 \\ \hline \end{array}$ |  | 17 | $\begin{aligned} & 25 \\ & 46 \\ & \hline \end{aligned}$ | $\begin{array}{r} 5 \\ 33 \\ \hline \end{array}$ | $\begin{array}{r} 42 \\ 8 \end{array}$ |  | 3 | $\begin{array}{\|l} \hline 36 \\ 45 \\ \hline \end{array}$ | $\begin{aligned} & 21 \\ & 48 \end{aligned}$ | $\begin{aligned} & 5^{8} \\ & 3^{2} \end{aligned}$ |  | 49 | $\begin{array}{\|r} \hline \mathbf{2} \\ 45 \\ \hline \end{array}$ | $\begin{array}{r} 36 \\ \hline \end{array}$ | $\begin{array}{r} 40 \\ \hline \\ \hline \end{array}$ |  |
| 12 |  | 43 | $\begin{array}{\|l\|} \hline 38 \\ 47 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \mathbf{5 1} \\ 59 \\ \hline \end{array}$ | $\begin{array}{\|r\|} \hline 38 \\ 5 \\ \hline \end{array}$ |  | 31 | $\begin{aligned} & \hline 16 \\ & 47 \end{aligned}$ | $\begin{aligned} & 55 \\ & 16 \end{aligned}$ | $24$ |  | 18 | $\begin{aligned} & \mathbf{1 1} \\ & 46 \\ & \hline \end{aligned}$ | $\begin{aligned} & 3^{8} \\ & 3^{2} \\ & \hline \end{aligned}$ | $\begin{aligned} & 50 \\ & 24 \\ & \hline \end{aligned}$ |  | 4 | $\begin{array}{\|l} 22 \\ 45 \\ \hline \end{array}$ | $\begin{aligned} & 10 \\ & 47 \\ & \hline \end{aligned}$ | $\begin{aligned} & 30 \\ & 46 \\ & \hline \end{aligned}$ |  | 49 | $\begin{array}{\|l} 47 \\ 45 \\ \hline \end{array}$ | $\begin{array}{r} 39 \\ 2 \end{array}$ | $\begin{array}{\|l\|} \hline 44 \\ 18 \end{array}$ |  |
| 13 |  | 44 | $\begin{array}{\|l\|} \hline 26 \\ 47 \\ \hline \end{array}$ | $\begin{aligned} & 50 \\ & 58 \\ & \hline \end{aligned}$ | $\begin{aligned} & 43 \\ & 23 \\ & \hline \end{aligned}$ |  | 32 | $\begin{array}{r} 4 \\ 47 \\ \hline \end{array}$ | $\begin{aligned} & 11 \\ & 15 \end{aligned}$ | $\begin{array}{\|l\|} \hline 35 \\ 27 \\ \hline \end{array}$ |  | 18 | $\begin{aligned} & 58 \\ & 46 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 11 \\ 31 \\ \hline \end{array}$ | $\begin{array}{\|l} 14 \\ 40 \\ \hline \end{array}$ |  | 5 | $\begin{array}{r} 7 \\ 45 \\ \hline \end{array}$ | $\begin{aligned} & 58 \\ & 47 \\ & \hline \end{aligned}$ | $\begin{array}{r} 16 \\ 1 \end{array}$ |  | 50 | $\begin{aligned} & 32 \\ & 45 \\ & \hline \end{aligned}$ | $42$ | $\begin{array}{\|r} \hline \mathbf{2} \\ 33 \\ \hline \end{array}$ | 3 |
| 14 |  | 45 | $\begin{aligned} & \hline \mathbf{1 4} \\ & 47 \\ & \hline \end{aligned}$ | $\begin{aligned} & 49 \\ & 57 \\ & \hline \end{aligned}$ | $\begin{array}{\|r} \hline 6 \\ 41 \\ \hline \end{array}$ |  | 32 | $\begin{aligned} & \mathbf{5 1} \\ & 47 \end{aligned}$ | $\begin{array}{\|l\|} \hline 27 \\ 14 \\ \hline \end{array}$ | $\begin{array}{\|r} \hline 2 \\ 44 \\ \hline \end{array}$ |  | 19 | $\begin{array}{r} 44 \\ 46 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline \mathbf{4 2}^{2} \\ 30 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline \mathbf{5 4} \\ 55 \\ \hline \end{array}$ |  | 5 | $\begin{array}{\|l} 53 \\ 45 \\ \hline \end{array}$ | $\begin{aligned} & 45 \\ & 46 \\ & \hline \end{aligned}$ | $\begin{aligned} & 17 \\ & 16 \\ & \hline \end{aligned}$ |  | 51 | $\begin{array}{\|l\|} \hline \mathbf{1 7} \\ \mathbf{4 5} \\ \hline \end{array}$ | $\begin{gathered} 43 \\ 0 \end{gathered}$ | $\begin{array}{\|l\|} \hline 35 \\ 47 \\ \hline \end{array}$ |  |
| 15 |  | 46 | $\begin{array}{r} 2 \\ 47 \\ \hline \end{array}$ | $\begin{aligned} & 46 \\ & 56 \end{aligned}$ | $\begin{aligned} & 47 \\ & 57 \\ & \hline \end{aligned}$ |  | 33 | $\begin{aligned} & 38 \\ & 47 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline \mathbf{4 1} \\ 14 \\ \hline \end{array}$ | $\begin{gathered} 46 \\ 0 \end{gathered}$ |  | 20 | $\begin{aligned} & \mathbf{3 1} \\ & 46 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 13 \\ 30 \\ \hline \end{array}$ | $\begin{array}{\|l} 49 \\ 12 \end{array}$ |  | 6 | $\begin{array}{\|l} 39 \\ 45 \\ \hline \end{array}$ | $\begin{array}{\|l} \mathbf{3 1} \\ \mathbf{4 5} \\ \hline \end{array}$ | $\begin{array}{\|l} 33 \\ 31 \\ \hline \end{array}$ |  | 52 | $\begin{array}{r} 2 \\ 45 \\ \hline \end{array}$ | $\begin{gathered} 44 \\ 0 \end{gathered}$ | $22$ |  |
| 16 |  | 46 | $\begin{aligned} & 50 \\ & 47 \\ & \hline \end{aligned}$ | $\begin{aligned} & 43 \\ & 56 \end{aligned}$ | $\begin{aligned} & 44 \\ & 16 \end{aligned}$ |  | 34 | $\begin{array}{\|} 25 \\ 47 \\ \hline \end{array}$ | $\begin{aligned} & 55 \\ & 13 \end{aligned}$ | $\begin{aligned} & 46 \\ & 17 \end{aligned}$ |  | 21 | $\begin{aligned} & 17 \\ & 46 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 44 \\ 29 \\ \hline \end{array}$ | $\begin{array}{\|r} \mathbf{1} \\ \mathbf{2 7} \\ \hline \end{array}$ |  | 7 | $\begin{array}{\|l} 25 \\ 45 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{1 7} \\ & \mathbf{4 4} \\ & \hline \end{aligned}$ | $\begin{array}{r} 4 \\ 4^{6} \\ \hline \end{array}$ |  | 52 | $\begin{aligned} & 47 \\ & 44 \\ & \hline \end{aligned}$ | $\begin{aligned} & 44 \\ & 59 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 22 \\ 15 \\ \hline \end{array}$ |  |
| 17 |  | 47 | $\begin{aligned} & 38 \\ & 47 \end{aligned}$ | $\begin{aligned} & 40 \\ & 55 \end{aligned}$ | $\begin{array}{r} \mathbf{0} \\ 33 \end{array}$ |  | 35 | $\begin{array}{\|l} \mathbf{1 3} \\ 47 \\ \hline \end{array}$ | $\begin{array}{r} 9 \\ 12 \end{array}$ | $\begin{array}{r} 3 \\ 34 \\ \hline \end{array}$ |  | 22 | $\begin{array}{r} 4 \\ 46 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 13 \\ 28 \end{array}$ | $\begin{aligned} & \mathbf{2 8} \\ & 43 \end{aligned}$ |  | 8 | $\begin{aligned} & \mathbf{1 1} \\ & 45 \\ & \hline \end{aligned}$ | $\begin{array}{r} 1 \\ 44 \\ \hline \end{array}$ | $\begin{gathered} 50 \\ 1 \end{gathered}$ |  | 53 | $\begin{aligned} & 32 \\ & 44 \end{aligned}$ | $\begin{aligned} & 43 \\ & 58 \end{aligned}$ | $\begin{array}{\|l} 37 \\ 29 \\ \hline \end{array}$ |  |
| 18 |  | 48 | $\begin{aligned} & 26 \\ & 47 \end{aligned}$ | $\begin{aligned} & 35 \\ & 54 \\ & \hline \end{aligned}$ | $\begin{aligned} & 33 \\ & 50 \\ & \hline \end{aligned}$ |  | $3^{6}$ | $\begin{array}{r} \mathbf{o} \\ 47 \end{array}$ | $\begin{aligned} & 21 \\ & 11 \end{aligned}$ | $\begin{aligned} & 37 \\ & 50 \\ & \hline \end{aligned}$ |  | 22 | $\begin{aligned} & 50 \\ & 46 \end{aligned}$ | $\begin{array}{\|l} \mathbf{4 2} \\ \mathbf{2 7} \\ \hline \end{array}$ | $\begin{array}{\|l\|} \mathbf{1 1} \\ 58 \\ \hline \end{array}$ |  | 8 | $\begin{aligned} & \mathbf{5 6} \\ & 45 \end{aligned}$ | $\begin{array}{\|l} 45 \\ 43 \end{array}$ | $\begin{aligned} & 51 \\ & 16 \end{aligned}$ |  | 54 | $\begin{array}{\|l} \mathbf{1 7} \\ \mathbf{4 4} \\ \hline \end{array}$ | $\begin{array}{\|l} \hline \mathbf{4 2} \\ 57 \\ \hline \end{array}$ | $\begin{array}{r} 6 \\ 43 \end{array}$ |  |
| 19 |  | 49 | $\begin{aligned} & \hline \mathbf{1 4} \\ & 47 \\ & \hline \end{aligned}$ | $\begin{aligned} & 30 \\ & 54 \\ & \hline \end{aligned}$ | $\begin{array}{\|r\|} \hline 23 \\ 7 \\ \hline \end{array}$ |  | 36 | $\begin{aligned} & 47 \\ & 47 \end{aligned}$ | $\begin{aligned} & 33 \\ & 11 \\ & \hline \end{aligned}$ | $\begin{array}{r} 27 \\ \hline 7 \\ \hline \end{array}$ |  | 23 | $\begin{aligned} & 37 \\ & 46 \end{aligned}$ | $\begin{array}{\|l} \hline 10 \\ 27 \\ \hline \end{array}$ | $\begin{array}{\|r} 9 \\ 14 \\ \hline \end{array}$ |  | 9 | $\begin{aligned} & \mathbf{4 2} \\ & 45 \\ & \hline \end{aligned}$ | $\begin{aligned} & 29 \\ & 4^{2} \end{aligned}$ | $\begin{array}{r} 7 \\ 3^{1} \\ \hline \end{array}$ |  | 55 | $\begin{array}{\|r} \hline \mathbf{2} \\ 44 \\ \hline \end{array}$ | $\begin{array}{\|l} 39 \\ 56 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 49 \\ 57 \\ \hline \end{array}$ |  |
| 20 | 38 | 50 | $\begin{array}{r} 2 \\ 47 \\ \hline \end{array}$ | $\begin{array}{\|l} 24 \\ 53 \\ \hline \end{array}$ | $\begin{aligned} & 30 \\ & 26 \\ & \hline \end{aligned}$ | 39 | 37 | $\begin{aligned} & 34 \\ & 47 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 44 \\ 10 \end{array}$ | $\begin{array}{\|l\|} \hline 34 \\ 23 \\ \hline \end{array}$ | 40 | 24 | $\begin{aligned} & 23 \\ & 46 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 37 \\ 26 \end{array}$ | $\begin{array}{\|l} 23 \\ 30 \\ \hline \end{array}$ | 41 | 10 | $\begin{array}{\|l\|} \hline 28 \\ 45 \\ \hline \end{array}$ | $\begin{aligned} & 11 \\ & \mathbf{4}^{1} \\ & \hline \end{aligned}$ | $\begin{aligned} & 38 \\ & 45 \\ & \hline \end{aligned}$ | 41 | 55 | $\begin{aligned} & 47 \\ & 44 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 36 \\ 56 \\ \hline \end{array}$ | $\begin{aligned} & 46 \\ & 11 \end{aligned}$ |  |
| 21 |  | 50 | $\begin{aligned} & \mathbf{5 0} \\ & 47 \\ & \hline \end{aligned}$ | $\begin{aligned} & 17 \\ & 5^{2} \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 56 \\ 42 \\ \hline \end{array}$ |  | $3^{8}$ | $\begin{array}{\|} \mathbf{2 1} \\ 47 \\ \hline \end{array}$ | $\begin{array}{r} 54 \\ 9 \\ \hline \end{array}$ | $\begin{array}{\|l} 57 \\ 40 \\ \hline \end{array}$ |  | 25 | $\begin{array}{\|l\|} \hline 10 \\ 46 \\ \hline \end{array}$ | $\begin{array}{r} 3 \\ 25 \\ \hline \end{array}$ | $\begin{aligned} & 53 \\ & 46 \\ & \hline \end{aligned}$ |  | 11 | $\begin{array}{\|l} 13 \\ 45 \\ \hline \end{array}$ | $\begin{array}{\|l} 53 \\ 41 \\ \hline \end{array}$ | $\begin{gathered} 23 \\ 0 \end{gathered}$ |  | 56 | $\begin{array}{\|l} \hline 32 \\ 44 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{3 2} \\ & 55 \end{aligned}$ | $\begin{array}{\|l} 57 \\ 25 \\ \hline \end{array}$ |  |
| 22 |  | 51 | $\begin{aligned} & \hline 38 \\ & 47 \end{aligned}$ | $\begin{aligned} & 10 \\ & 52 \end{aligned}$ | $\begin{gathered} 3^{8} \\ 0 \end{gathered}$ |  | 39 | $\begin{array}{r} 9 \\ 47 \end{array}$ | $\begin{aligned} & 4 \\ & 8 \end{aligned}$ | $37$ |  | 25 | $\begin{aligned} & 56 \\ & 46 \\ & \hline \end{aligned}$ | $\begin{aligned} & 29 \\ & 25 \end{aligned}$ | $\begin{array}{r} 39 \\ 1 \end{array}$ |  | 11 | $\begin{array}{\|l} 59 \\ 45 \end{array}$ | $\begin{aligned} & 34 \\ & 40 \end{aligned}$ | $\begin{array}{\|l} \hline 23 \\ 15 \\ \hline \end{array}$ |  | 57 | $\begin{array}{\|l\|} \hline \mathbf{1 7} \\ 44 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{2 8} \\ & 54 \end{aligned}$ | $\begin{aligned} & \mathbf{2 2} \\ & 39 \end{aligned}$ |  |
| 23 |  | 52 | $\begin{aligned} & 26 \\ & 47 \\ & \hline \end{aligned}$ | $\begin{array}{r} 2 \\ 51 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 3^{8} \\ 17 \end{array}$ |  | 39 | $\begin{aligned} & 56 \\ & 47 \end{aligned}$ | $\begin{array}{\|r} 13 \\ 8 \end{array}$ | $\begin{aligned} & 34 \\ & 12 \end{aligned}$ |  | 26 | $\begin{aligned} & 42 \\ & 46 \end{aligned}$ | $\begin{array}{\|l} 54 \\ 24 \end{array}$ | $\begin{array}{\|l} \mathbf{4 0} \\ \mathbf{1} 7 \end{array}$ |  | 12 | $\begin{aligned} & 45 \\ & 45 \end{aligned}$ | $\begin{aligned} & \mathbf{1 4} \\ & 39 \\ & \hline \end{aligned}$ | $\begin{aligned} & 3^{8} \\ & 30 \end{aligned}$ |  | 58 | $\begin{array}{r} 2 \\ 44 \\ \hline \end{array}$ | $\begin{array}{\|l} \mathbf{2 3} \\ 53 \\ \hline \end{array}$ | $\begin{array}{\|r} \mathbf{1} \\ 53 \\ \hline \end{array}$ |  |
| 24 |  | 53 | $\begin{aligned} & \hline 13 \\ & 47 \\ & \hline \end{aligned}$ | $\begin{aligned} & 53 \\ & 50 \\ & \hline \end{aligned}$ | $\begin{aligned} & 55 \\ & 35 \\ & \hline \end{aligned}$ |  | 40 | $\begin{aligned} & 43 \\ & 47 \\ & \hline \end{aligned}$ | $\begin{array}{r} 21 \\ \hline 7 \\ \hline \end{array}$ | $\begin{aligned} & 46 \\ & 30 \\ & \hline \end{aligned}$ |  | 27 | $\begin{aligned} & 29 \\ & 46 \\ & \hline \end{aligned}$ | $\begin{aligned} & 18 \\ & 23 \\ & \hline \end{aligned}$ | $\begin{aligned} & \mathbf{5 7} \\ & 32 \\ & \hline \end{aligned}$ |  | 13 | $\begin{aligned} & 30 \\ & 45 \\ & \hline \end{aligned}$ | $\begin{aligned} & 54 \\ & 38 \\ & \hline \end{aligned}$ | $\begin{array}{\|r} \hline 8 \\ 45 \\ \hline \end{array}$ |  | 58 | $\begin{array}{\|l\|} \hline 47 \\ 44 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 16 \\ 53 \\ \hline \end{array}$ | $\begin{array}{r} 54 \\ \hline 6 \end{array}$ |  |
| 25 |  | 54 | $\begin{array}{r} \mathbf{1} \\ 47 \\ \hline \end{array}$ | $\begin{aligned} & 44 \\ & 49 \end{aligned}$ | $\begin{aligned} & 30 \\ & 52 \\ & \hline \end{aligned}$ |  | 41 | $\begin{aligned} & 30 \\ & 47 \\ & \hline \end{aligned}$ | $\begin{array}{r} 29 \\ 6 \end{array}$ | $\begin{aligned} & \hline 16 \\ & 46 \\ & \hline \end{aligned}$ |  | 28 | $\begin{array}{\|l} 15 \\ 46 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{4 2} \\ & \mathbf{2 2} \end{aligned}$ | $\begin{aligned} & 29 \\ & 48 \\ & \hline \end{aligned}$ |  | 14 | $\begin{aligned} & 16 \\ & 45 \\ & \hline \end{aligned}$ | $\begin{aligned} & 3^{2} \\ & 3^{8} \end{aligned}$ | $\begin{gathered} 53 \\ 0 \end{gathered}$ |  | 59 | $\begin{aligned} & 32 \\ & 44 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 10 \\ 52 \\ \hline \end{array}$ | $\begin{array}{r} 0 \\ 21 \\ 21 \end{array}$ | 5 |
| 26 |  | 54 | $\begin{aligned} & 49 \\ & 47 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 34 \\ 49 \\ \hline \end{array}$ | $\begin{array}{\|r} 22 \\ 9 \\ \hline \end{array}$ |  | 42 | $\begin{aligned} & \mathbf{1 7} \\ & 47 \\ & \hline \end{aligned}$ | $\begin{array}{r} 36 \\ 6 \end{array}$ | $\begin{aligned} & 2 \\ & 2 \end{aligned}$ |  | 29 | $\begin{array}{r} 2 \\ 4^{6} \\ \hline \end{array}$ | $\begin{array}{r} 5 \\ 22 \end{array}$ | $\begin{array}{r} 17 \\ 4 \end{array}$ |  | 15 | $\begin{array}{r} 2 \\ 45 \\ \hline \end{array}$ | $\begin{array}{\|l} 10 \\ 37 \\ \hline \end{array}$ | $\begin{array}{\|l} 53 \\ 14 \\ \hline \end{array}$ | 42 | 0 | $\begin{array}{\|l\|} \hline \mathbf{1 7} \\ 44 \\ \hline \end{array}$ | $\begin{array}{\|r} 2 \\ 51 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \mathbf{2 1} \\ 35 \\ \hline \end{array}$ | 6 |
| 27 |  | 55 | $\begin{aligned} & 37 \\ & 47 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 23 \\ 48 \\ \hline \end{array}$ | $\begin{aligned} & 31 \\ & 26 \end{aligned}$ |  | 43 | $\begin{array}{r} 4 \\ 47 \\ \hline \end{array}$ | $\begin{array}{r} 42 \\ 5 \\ \hline \end{array}$ | $\begin{array}{r} 4 \\ 19 \\ \hline \end{array}$ |  | 29 | $\begin{aligned} & 48 \\ & 46 \\ & \hline \end{aligned}$ | $\begin{aligned} & 27 \\ & 21 \end{aligned}$ | $\begin{array}{\|l\|} \mathbf{2 1} \\ \mathbf{1 9} \\ \hline \end{array}$ |  | 15 | $\begin{array}{\|l} 47 \\ 45 \\ \hline \end{array}$ | $\begin{aligned} & 48 \\ & 36 \end{aligned}$ | $\begin{array}{r} 7 \\ 29 \\ \hline \end{array}$ |  | 1 | $\begin{array}{\|r} \mathbf{1} \\ 44 \\ \hline \end{array}$ | $\begin{array}{\|l} 53 \\ 50 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 56 \\ 49 \\ \hline \end{array}$ | 7 |
| 28 |  | 56 | $\begin{aligned} & 25 \\ & 47 \end{aligned}$ | $\begin{array}{\|l\|} \mathbf{1 1} \\ 47 \\ \hline \end{array}$ | $\begin{aligned} & 57 \\ & 44 \\ & \hline \end{aligned}$ |  | 43 | $\begin{array}{\|l} \mathbf{5 1} \\ \mathbf{4 7} \end{array}$ | $\begin{array}{r} 47 \\ 4 \\ \hline \end{array}$ | $\begin{aligned} & 23 \\ & 35 \end{aligned}$ |  | 30 | $\begin{aligned} & 34 \\ & 46 \\ & \hline \end{aligned}$ | $\begin{aligned} & 48 \\ & 20 \end{aligned}$ | $\begin{aligned} & 40 \\ & 35 \end{aligned}$ |  | 16 | $\begin{aligned} & 33 \\ & 45 \\ & \hline \end{aligned}$ | $\begin{aligned} & 24 \\ & 35 \end{aligned}$ | $\begin{aligned} & 36 \\ & 44 \end{aligned}$ |  | 1 | $\begin{aligned} & 46 \\ & 44 \\ & \hline \end{aligned}$ | $\begin{aligned} & 44 \\ & 50 \end{aligned}$ | $\begin{array}{r} 45 \\ 2 \end{array}$ |  |
| 29 |  | 57 | $\begin{aligned} & 12 \\ & 47 \end{aligned}$ | $\begin{array}{\|l} 59 \\ 47 \\ \hline \end{array}$ | $\begin{array}{r} 41 \\ 1 \end{array}$ |  | 44 | $\begin{aligned} & 3^{8} \\ & 47 \end{aligned}$ | $\begin{array}{r} \mathbf{5 1} \\ 3 \end{array}$ | $\begin{aligned} & 58 \\ & 51 \\ & \hline \end{aligned}$ |  | 31 | $\begin{aligned} & 21 \\ & 46 \\ & \hline \end{aligned}$ | $\begin{array}{r} 9 \\ 19 \\ \hline \end{array}$ | $\begin{aligned} & 15 \\ & 50 \end{aligned}$ |  | 17 | $\begin{aligned} & 19 \\ & 45 \\ & \hline \end{aligned}$ | $\begin{array}{r} \mathbf{o} \\ 34 \end{array}$ | $\begin{aligned} & 20 \\ & 58 \end{aligned}$ |  | 2 | $\begin{aligned} & \mathbf{3 1} \\ & 44 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 34 \\ 49 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 47 \\ 17 \end{array}$ |  |
| 30 | $3^{8}$ | 58 | $\begin{array}{r} \mathbf{o} \\ 47 \\ \hline \end{array}$ | $\begin{aligned} & 46 \\ & 46 \end{aligned}$ | $\begin{aligned} & 42 \\ & 19 \\ & \hline \end{aligned}$ | 39 | 45 | $\begin{array}{\|l} 25 \\ 47 \\ \hline \end{array}$ | $\begin{array}{r} 55 \\ 3 \end{array}$ | $\begin{array}{\|r} 49 \\ 8 \end{array}$ | 40 | 32 | $\begin{array}{r} 7 \\ 4^{6} \\ \hline \end{array}$ | $\begin{array}{\|} 29 \\ 19 \\ \hline \end{array}$ | $\begin{aligned} & 5 \\ & 6 \end{aligned}$ | 41 | 18 | $\begin{array}{r} 4 \\ 45 \\ \hline \end{array}$ | $\begin{aligned} & 35 \\ & 34 \\ & \hline \end{aligned}$ | $\begin{aligned} & \hline 18 \\ & 13 \end{aligned}$ | 42 | 3 | $\begin{aligned} & 16 \\ & 44 \end{aligned}$ | $\begin{array}{r} 24 \\ 48 \\ \hline \end{array}$ | $\begin{array}{r} 4 \\ 30 \\ \hline \end{array}$ |  |

Bürgi's 1' sine table (reconstruction, D. Roegel, 2016)

| 1 | $40^{\circ}$ |  |  |  |  | $41^{\circ}$ |  |  |  |  | $42^{\circ}$ |  |  |  |  | $43^{\circ}$ |  |  |  |  | $44^{\circ}$ |  |  |  |  | , |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 30 | $3^{8}$ | 58 | $\begin{array}{\|r} \hline \mathbf{o} \\ 47 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 46 \\ 46 \\ \hline \end{array}$ | $\begin{aligned} & 42 \\ & 19 \end{aligned}$ | 39 | 45 | $\begin{aligned} & 25 \\ & 47 \end{aligned}$ | $\begin{array}{r} 55 \\ \hline \end{array}$ | $\begin{array}{r} 49 \\ \hline 8 \end{array}$ | 40 | 32 | $\begin{array}{r} 7 \\ 46 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 29 \\ 19 \\ \hline \end{array}$ | $\begin{aligned} & 5 \\ & 6 \end{aligned}$ | 41 | 18 | $\begin{array}{r} 4 \\ 45 \\ \hline \end{array}$ | $\begin{aligned} & 35 \\ & 34 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 18 \\ 13 \\ \hline \end{array}$ | 42 | 3 | $\begin{array}{\|l\|} \hline 16 \\ 44 \\ \hline \end{array}$ | $\begin{aligned} & \hline 24 \\ & 48 \\ & \hline \end{aligned}$ | $\begin{array}{r} 4 \\ 30 \end{array}$ | 30 |
| 31 |  | 58 | $\begin{array}{\|l} \hline 48 \\ 47 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 33 \\ 45 \\ \hline \end{array}$ | $\begin{array}{\|r} \mathbf{1} \\ 35 \\ \hline \end{array}$ |  | 46 | $\begin{array}{\|l} 12 \\ 47 \\ \hline \end{array}$ | $\begin{gathered} 58 \\ 2 \end{gathered}$ | $\begin{aligned} & \hline 57 \\ & 25 \\ & \hline \end{aligned}$ |  | 32 | $\begin{array}{\|l\|} \hline 53 \\ 46 \\ \hline \end{array}$ | $\begin{aligned} & 48 \\ & 18 \\ & \hline \end{aligned}$ | $\begin{aligned} & 11 \\ & 22 \end{aligned}$ |  | 18 | $\begin{aligned} & 50 \\ & 45 \\ & \hline \end{aligned}$ | $\begin{array}{\|r} 9 \\ 33 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{3 1} \\ & \mathbf{2 8} \end{aligned}$ |  | 4 | \| 1 | $\begin{array}{\|l} \hline 12 \\ 47 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline \mathbf{3 4} \\ \mathbf{4 5} \\ \hline \end{array}$ | 31 |
| 32 |  | 59 | $\begin{array}{\|l} \hline 36 \\ 47 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 18 \\ 44 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 36 \\ 53 \\ \hline \end{array}$ |  | 47 | $\begin{array}{r} \mathbf{o} \\ 47 \\ \hline \end{array}$ | $\mathbf{1}$ | $\begin{aligned} & 22 \\ & 41 \\ & \hline \end{aligned}$ |  | 33 | $\begin{aligned} & \hline 40 \\ & 46 \\ & \hline \end{aligned}$ | $\begin{array}{\|r} \hline 6 \\ 17 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 33 \\ 37 \\ \hline \end{array}$ |  | 19 | $\begin{aligned} & 35 \\ & 45 \\ & \hline \end{aligned}$ | $\begin{aligned} & 42 \\ & 3^{2} \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 59 \\ 43 \\ \hline \end{array}$ |  | 4 | $\begin{aligned} & 46 \\ & 44 \end{aligned}$ | $\begin{array}{r} \hline \mathbf{0} \\ 4^{6} \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 19 \\ 58 \\ \hline \end{array}$ | $3^{2}$ |
| 33 | 39 | 0 | $\begin{array}{\|l\|} \hline 24 \\ 47 \\ \hline \end{array}$ | $\begin{array}{\|r} \hline 3 \\ 44 \\ \hline \end{array}$ | $\begin{aligned} & 29 \\ & 10 \end{aligned}$ |  | 47 | $\begin{aligned} & 47 \\ & 47 \\ & \hline \end{aligned}$ | $\begin{aligned} & 3 \\ & 0 \end{aligned}$ | $\begin{array}{r} 3 \\ 57 \\ \hline \end{array}$ |  | 34 | $\begin{array}{\|l\|} \hline 26 \\ 46 \\ \hline \end{array}$ | $\begin{aligned} & 24 \\ & 16 \end{aligned}$ | $\begin{array}{\|l} \hline 10 \\ 52 \\ \hline \end{array}$ |  | 20 | $\begin{array}{\|l\|} \hline \mathbf{2 1} \\ 45 \\ \hline \end{array}$ | $\begin{aligned} & 15 \\ & 31 \end{aligned}$ | $\begin{array}{\|l} \hline 42 \\ 57 \\ \hline \end{array}$ |  | 5 | $\begin{aligned} & 30 \\ & 44 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 47 \\ 46 \\ \hline \end{array}$ | $\begin{aligned} & \hline 17 \\ & 12 \end{aligned}$ | 33 |
| 34 |  | 1 | $\begin{array}{\|l\|} \mathbf{1 1} \\ 47 \\ \hline \end{array}$ | $\begin{array}{\|l} 47 \\ 43 \\ \hline \end{array}$ | $\left[\begin{array}{l} 39 \\ 28 \end{array}\right.$ |  | 48 | $\begin{array}{\|l} 34 \\ 47 \\ \hline \end{array}$ | $\begin{aligned} & 4 \\ & 0 \\ & \hline \end{aligned}$ | $\begin{array}{r} 0 \\ 13 \\ \hline \end{array}$ |  | 35 | $\begin{array}{\|l} 12 \\ 46 \\ \hline \end{array}$ | $\begin{array}{\|l} 41 \\ 16 \end{array}$ | $\begin{aligned} & 2 \\ & 9 \\ & \hline \end{aligned}$ |  | 21 | $\begin{array}{r} \hline 6 \\ 45 \\ \hline \end{array}$ | $\begin{array}{\|} 47 \\ 31 \\ \hline \end{array}$ | $\begin{aligned} & 39 \\ & 12 \end{aligned}$ |  | 6 | $\begin{array}{\|l} 15 \\ 44 \\ \hline \end{array}$ | $\begin{array}{\|l} 33 \\ 45 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 29 \\ 25 \\ \hline \end{array}$ | 34 |
| 35 |  | 1 | $\begin{array}{\|l} 59 \\ 47 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 31 \\ 4^{2} \\ \hline \end{array}$ | $\begin{array}{\|r} 7 \\ 44 \\ \hline \end{array}$ |  | 49 | $\begin{aligned} & 21 \\ & 4^{6} \\ & \hline \end{aligned}$ | $\begin{array}{r} 4 \\ 59 \\ \hline \end{array}$ | $\begin{aligned} & 13 \\ & 30 \\ & \hline \end{aligned}$ |  | 35 | $\begin{array}{\|l\|} \hline 58 \\ 46 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 57 \\ 15 \\ \hline \end{array}$ | $\begin{array}{\|l\|l\|} \hline 11 \\ 23 \\ \hline \end{array}$ |  | 21 | $\begin{array}{\|l} 52 \\ 45 \\ \hline \end{array}$ | $\begin{array}{\|l} 18 \\ 30 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 51 \\ 26 \\ \hline \end{array}$ |  | 7 | $\begin{array}{r} \mathbf{o} \\ 44 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 18 \\ 44 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 54 \\ 40 \\ \hline \end{array}$ | 35 |
| 36 |  | 2 | $\begin{array}{\|l} 47 \\ 47 \\ \hline \end{array}$ | $\begin{aligned} & 13 \\ & 4^{2} \end{aligned}$ | $\begin{array}{r} 51 \\ 2 \end{array}$ |  | 50 | $\begin{array}{r} 8 \\ 46 \\ \hline \end{array}$ | $\begin{array}{\|r} \mathbf{3} \\ 58 \\ \hline \end{array}$ | $\begin{aligned} & 43 \\ & 46 \end{aligned}$ |  | 36 | $\begin{aligned} & 45 \\ & 46 \end{aligned}$ | $\begin{array}{\|l} 12 \\ 14 \end{array}$ | $\begin{array}{\|l} \mathbf{3 4} \\ 39 \\ \hline \end{array}$ |  | 22 | $\begin{array}{\|l} 37 \\ 45 \\ \hline \end{array}$ | $\begin{aligned} & 49 \\ & 29 \end{aligned}$ | $\begin{aligned} & 17 \\ & 41 \end{aligned}$ |  | 7 | $\begin{aligned} & 45 \\ & 44 \end{aligned}$ | $\begin{array}{r} 3 \\ 43 \\ \hline \end{array}$ | $\left\lvert\, \begin{aligned} & \mathbf{3 4} \\ & 53 \end{aligned}\right.$ | 36 |
| 37 |  | 3 | $\begin{array}{\|l\|} \hline 34 \\ 47 \\ \hline \end{array}$ | $\begin{aligned} & 55 \\ & 41 \end{aligned}$ | $\begin{array}{\|l\|} \hline 53 \\ 19 \\ \hline \end{array}$ |  | 50 | $\begin{aligned} & 55 \\ & 46 \end{aligned}$ | $\begin{array}{\|r} 2 \\ 58 \\ \hline \end{array}$ | $\begin{array}{r} 29 \\ 2 \end{array}$ |  | 37 | $\begin{array}{\|l\|l\|} \hline \mathbf{3 1} \\ 46 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 27 \\ 13 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 13 \\ 54 \\ \hline \end{array}$ |  | 23 | $\begin{aligned} & 23 \\ & 45 \\ & \hline \end{aligned}$ | $\begin{aligned} & 18 \\ & 28 \end{aligned}$ | $\begin{array}{\|l} \hline 58 \\ 56 \\ \hline \end{array}$ |  | 8 | $\begin{aligned} & 29 \\ & 44 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 47 \\ 43 \\ \hline \end{array}$ | $\begin{array}{r} 27 \\ 8 \end{array}$ | 37 |
| 38 |  | 4 | $\begin{array}{\|l} 22 \\ 47 \\ \hline \end{array}$ | $\begin{aligned} & 37 \\ & 40 \\ & \hline \end{aligned}$ | $\begin{aligned} & 12 \\ & 36 \\ & \hline \end{aligned}$ |  | 51 | $\begin{aligned} & 42 \\ & 46 \end{aligned}$ | $\begin{array}{\|r} \mathbf{o} \\ 57 \\ \hline \end{array}$ | $\begin{array}{\|l} \mathbf{3 1} \\ \mathbf{1 9} \\ \hline \end{array}$ |  | $3^{8}$ | $\begin{aligned} & 17 \\ & 46 \end{aligned}$ | $\begin{array}{\|l} \mathbf{4 1} \\ 13 \end{array}$ | $\begin{array}{r} 7 \\ 10 \end{array}$ |  | 24 | $\begin{array}{r} 8 \\ 45 \end{array}$ | $\begin{aligned} & 47 \\ & 28 \end{aligned}$ | $\begin{aligned} & 54 \\ & 10 \end{aligned}$ |  | 9 | $\begin{array}{\|l} \mathbf{1 4} \\ 44 \\ \hline \end{array}$ | $\begin{aligned} & 30 \\ & 42 \end{aligned}$ | $\begin{aligned} & 35 \\ & 21 \end{aligned}$ | $3^{8}$ |
| 39 |  | 5 | $\begin{array}{\|l} \mathbf{1 0} \\ 47 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{1 7} \\ & \mathbf{3 9} \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 48 \\ 53 \\ \hline \end{array}$ |  | 52 | $\begin{aligned} & 28 \\ & 46 \end{aligned}$ | $\begin{aligned} & 57 \\ & 56 \\ & \hline \end{aligned}$ | $\begin{aligned} & 50 \\ & 35 \end{aligned}$ |  | 39 | $\begin{array}{r} 3 \\ 46 \\ \hline \end{array}$ | $\begin{aligned} & 54 \\ & 12 \end{aligned}$ | $\begin{aligned} & \mathbf{1 7} \\ & 26 \end{aligned}$ |  | 24 | $\begin{array}{\|} 54 \\ 45 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 16 \\ 27 \\ \hline \end{array}$ | $\begin{array}{r} 4 \\ 25 \\ \hline \end{array}$ |  | 9 | $\begin{array}{\|l} 59 \\ 44 \end{array}$ | $\begin{array}{\|l} 12 \\ 41 \\ \hline \end{array}$ | $\begin{aligned} & \hline 56 \\ & 34 \end{aligned}$ | 39 |
| 40 | 39 | 5 | $\begin{array}{\|l} 57 \\ 47 \\ \hline \end{array}$ | $\begin{array}{\|l} 57 \\ 39 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 41 \\ 10 \\ \hline \end{array}$ | 39 | 53 | $\begin{aligned} & 15 \\ & 46 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline \mathbf{5 4} \\ 55 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 25 \\ 51 \\ \hline \end{array}$ | 40 | 39 | $\begin{array}{\|l} \hline 50 \\ 46 \\ \hline \end{array}$ | $\begin{array}{r} 6 \\ 11 \end{array}$ | $\begin{aligned} & 43 \\ & 40 \\ & \hline \end{aligned}$ | 41 | 25 | $\begin{array}{\|l} 39 \\ 45 \\ \hline \end{array}$ | $\begin{array}{\|l} 43 \\ 26 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 29 \\ 40 \\ \hline \end{array}$ | 42 | 10 | $\begin{aligned} & 43 \\ & 44 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 54 \\ 40 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 30 \\ 49 \\ \hline \end{array}$ | 40 |
| 41 |  | 6 | $\begin{aligned} & 45 \\ & 47 \\ & \hline \end{aligned}$ | $\begin{aligned} & \hline 36 \\ & 38 \\ & \hline \end{aligned}$ | $\begin{aligned} & \mathbf{5 1} \\ & \mathbf{2 8} \\ & \hline \end{aligned}$ |  | 54 | $\begin{array}{r} 2 \\ 4^{6} \\ \hline \end{array}$ | $\begin{aligned} & 50 \\ & 55 \\ & \hline \end{aligned}$ | $\begin{array}{\|r} \hline 16 \\ 8 \\ \hline \end{array}$ |  | 40 | $\begin{aligned} & \hline 36 \\ & 4^{6} \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 18 \\ 10 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 23 \\ 56 \\ \hline \end{array}$ |  | 26 | $\begin{array}{\|l} \hline 25 \\ 45 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 10 \\ 25 \\ \hline \end{array}$ | $\begin{array}{\|r} \hline 9 \\ 54 \\ \hline \end{array}$ |  | 11 | $\begin{aligned} & 28 \\ & 44 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 35 \\ 40 \\ \hline \end{array}$ | $\begin{array}{r} 19 \\ \hline 2 \end{array}$ | 41 |
| 42 |  | 7 | $\begin{aligned} & 33 \\ & 47 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 15 \\ 37 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 19 \\ 44 \\ \hline \end{array}$ |  | 54 | $\begin{aligned} & 49 \\ & 46 \\ & \hline \end{aligned}$ | $\begin{aligned} & 45 \\ & 54 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 24 \\ 23 \\ \hline \end{array}$ |  | 41 | $\begin{array}{\|l\|} \hline 22 \\ 46 \\ \hline \end{array}$ | $\begin{aligned} & 29 \\ & 10 \\ & \hline \end{aligned}$ | $\begin{aligned} & 19 \\ & 12 \\ & \hline \end{aligned}$ |  | 27 | $\begin{array}{\|l\|} \hline 10 \\ 45 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 36 \\ 25 \\ \hline \end{array}$ | $\begin{aligned} & 3 \\ & 8 \\ & \hline \end{aligned}$ |  | 12 | $\begin{array}{\|l} 13 \\ 44 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 15 \\ 39 \\ \hline \end{array}$ | $\begin{aligned} & \hline 21 \\ & 16 \end{aligned}$ | 42 |
| 43 |  | 8 | $\begin{array}{\|l} \hline 20 \\ 47 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 53 \\ 37 \\ \hline \end{array}$ | $\begin{aligned} & 3 \\ & 2 \end{aligned}$ |  | 55 | $\begin{aligned} & 36 \\ & 46 \end{aligned}$ | $\begin{array}{\|l\|} \hline 39 \\ 53 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 47 \\ 40 \\ \hline \end{array}$ |  | 42 | $\begin{array}{\|r} \hline 8 \\ 4^{6} \\ \hline \end{array}$ | $\begin{array}{r} 39 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline \mathbf{3 1} \\ \mathbf{2 7} \\ \hline \end{array}$ |  | 27 | $\begin{aligned} & 56 \\ & 45 \\ & \hline \end{aligned}$ | $\begin{array}{r} \mathbf{1} \\ \mathbf{2 4} \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 11 \\ 24 \\ \hline \end{array}$ |  | 12 | $\begin{aligned} & 57 \\ & 44 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 54 \\ 38 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 37 \\ 29 \\ \hline \end{array}$ | 43 |
| 44 |  | 9 | $\begin{array}{r} 8 \\ 47 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 30 \\ 36 \\ \hline \end{array}$ | $\begin{array}{r} 5 \\ 19 \\ \hline \end{array}$ |  | 56 | $\begin{aligned} & 23 \\ & 46 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 33 \\ 52 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 27 \\ 56 \\ \hline \end{array}$ |  | 42 | $\begin{array}{\|l} 54 \\ 46 \\ \hline \end{array}$ | $\begin{array}{r} 48 \\ 8 \end{array}$ | $\begin{array}{\|l} \hline 58 \\ 4^{2} \\ \hline \end{array}$ |  | 28 | $\begin{array}{\|l} \hline \mathbf{4 1} \\ \mathbf{4 5} \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 25 \\ 23 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 35 \\ 37 \\ \hline \end{array}$ |  | 13 | $\begin{array}{\|l} 42 \\ 44 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 33 \\ 37 \\ \hline \end{array}$ | $\begin{array}{\|r} \hline 6 \\ 44 \\ \hline \end{array}$ | 44 |
| 45 |  | 9 | $\begin{aligned} & 56 \\ & 47 \\ & \hline \end{aligned}$ | $\begin{array}{\|r} \hline 6 \\ 35 \\ \hline \end{array}$ | $\begin{aligned} & 24 \\ & 35 \\ & \hline \end{aligned}$ |  | 57 | $\begin{array}{\|l} 10 \\ 46 \\ \hline \end{array}$ | $\begin{aligned} & 26 \\ & 52 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 23 \\ 13 \\ \hline \end{array}$ |  | 43 | $\begin{array}{\|l} \hline 40 \\ 46 \\ \hline \end{array}$ | $\begin{array}{\|r} 57 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{4 0} \\ & 57 \\ & \hline \end{aligned}$ |  | 29 | $\begin{array}{\|l\|} \hline 26 \\ 45 \\ \hline \end{array}$ | $\begin{aligned} & \hline 49 \\ & 22 \end{aligned}$ | $\begin{aligned} & 12 \\ & 52 \\ & \hline \end{aligned}$ |  | 14 | $\begin{array}{\|} 27 \\ 44 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 10 \\ 36 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 50 \\ 57 \\ \hline \end{array}$ | 45 |
| 46 |  | 10 | $\begin{aligned} & 43 \\ & 47 \\ & \hline \end{aligned}$ | $\begin{aligned} & \mathbf{4 1} \\ & 34 \end{aligned}$ | $\begin{aligned} & 59 \\ & 53 \\ & \hline \end{aligned}$ |  | 57 | $\begin{aligned} & 57 \\ & 46 \\ & \hline \end{aligned}$ | $\begin{aligned} & 18 \\ & 51 \\ & \hline \end{aligned}$ | $\begin{aligned} & 36 \\ & 28 \end{aligned}$ |  | 44 | $\begin{aligned} & 27 \\ & 46 \end{aligned}$ | $7$ | $\begin{array}{\|l} \mathbf{3 7} \\ 13 \\ \hline \end{array}$ |  | 30 | $\begin{array}{\|l} \mathbf{1 2} \\ 45 \\ \hline \end{array}$ | $\begin{aligned} & 12 \\ & 22 \end{aligned}$ | $\begin{aligned} & 4 \\ & 7 \\ & \hline \end{aligned}$ |  | 15 | $\begin{array}{\|l\|} \mathbf{1 1} \\ 44 \\ \hline \end{array}$ | $\begin{aligned} & 47 \\ & 36 \\ & \hline \end{aligned}$ | $\begin{aligned} & 47 \\ & 10 \end{aligned}$ | 46 |
| 47 |  | 11 | $\begin{aligned} & \mathbf{3 1} \\ & 47 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline \mathbf{1 6} \\ 34 \\ \hline \end{array}$ | $\begin{aligned} & 52 \\ & 10 \end{aligned}$ |  | 58 | $\begin{aligned} & 44 \\ & 46 \end{aligned}$ | $\begin{aligned} & 10 \\ & 50 \end{aligned}$ | $\begin{array}{r} 4 \\ 45 \\ \hline \end{array}$ |  | 45 | $\begin{array}{\|l} \hline 13 \\ 46 \\ \hline \end{array}$ | $\begin{array}{r} 12 \\ 6 \end{array}$ | $\begin{aligned} & \mathbf{5 0} \\ & 28 \end{aligned}$ |  | 30 | $\begin{aligned} & 57 \\ & 45 \\ & \hline \end{aligned}$ | $\begin{aligned} & 34 \\ & 24 \end{aligned}$ | $\begin{aligned} & 11 \\ & 21 \end{aligned}$ |  | 15 | $\begin{aligned} & 56 \\ & 44 \\ & \hline \end{aligned}$ | $\begin{aligned} & 23 \\ & 35 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 57 \\ 25 \\ \hline \end{array}$ | 47 |
| 48 |  | 12 | $\begin{aligned} & \mathbf{1 8} \\ & 47 \end{aligned}$ | $\begin{array}{\|l} \mathbf{5 1} \\ 33 \\ \hline \end{array}$ | $\begin{array}{r} 2 \\ 26 \end{array}$ |  | 59 | $\begin{aligned} & \mathbf{3 1} \\ & 46 \\ & \hline \end{aligned}$ | $\begin{array}{r} 0 \\ 50 \end{array}$ | $\begin{array}{r} 49 \\ 1 \end{array}$ |  | 45 | $\begin{aligned} & 59 \\ & 46 \end{aligned}$ | $\begin{array}{r} 19 \\ 5 \end{array}$ | $\begin{aligned} & \hline \mathbf{1 8} \\ & 44 \end{aligned}$ |  | 31 | $\begin{aligned} & 4^{2} \\ & 45 \\ & \hline \end{aligned}$ | $\begin{aligned} & 55 \\ & 20 \end{aligned}$ | $\begin{aligned} & \mathbf{3 2}^{2} \\ & 3^{6} \\ & \hline \end{aligned}$ |  | 16 | $\begin{aligned} & 40 \\ & 44 \end{aligned}$ | $\begin{array}{\|l} 59 \\ 34 \end{array}$ | $\begin{array}{\|l} 22 \\ 38 \end{array}$ | 48 |
| 49 |  | 13 | $\begin{array}{\|r} \hline 6 \\ 47 \\ \hline \end{array}$ | $\begin{aligned} & 24 \\ & 32 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 28 \\ 44 \\ \hline \end{array}$ | 40 | 0 | $\begin{aligned} & \mathbf{1 7} \\ & 46 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 50 \\ 49 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{5 0} \\ & 17 \\ & \hline \end{aligned}$ |  | 46 | $\begin{array}{\|l\|} \hline 45 \\ 46 \\ \hline \end{array}$ | $\begin{array}{r} 25 \\ \hline 4 \\ \hline \end{array}$ | $\begin{array}{r} \mathbf{2} \\ 58 \\ \hline \end{array}$ |  | 32 | $\begin{array}{\|l} \hline \mathbf{2 8} \\ 45 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 16 \\ 19 \\ \hline \end{array}$ | $\begin{array}{\|r} 8 \\ 50 \\ \hline \end{array}$ |  | 17 | $\begin{array}{\|l} 25 \\ 44 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline \mathbf{3 4} \\ 33 \\ \hline \end{array}$ | $\begin{array}{\|r} \hline 0 \\ 51 \\ \hline \end{array}$ | 49 |
| 50 | 39 | 13 | $\begin{aligned} & 53 \\ & 47 \\ & \hline \end{aligned}$ | $\begin{aligned} & 57 \\ & 3^{2} \\ & \hline \end{aligned}$ | $\begin{array}{r} 12 \\ 1 \end{array}$ | 40 | 1 | $\begin{array}{r} 4 \\ 46 \end{array}$ | $\begin{array}{\|l} \hline 40 \\ 48 \\ \hline \end{array}$ | $\begin{array}{r} 7 \\ 33 \\ \hline \end{array}$ | 40 | 47 | $\begin{array}{\|l\|l\|} \hline \mathbf{3 1} \\ 46 \\ \hline \end{array}$ | $\begin{array}{r} 30 \\ \hline 4 \\ \hline \end{array}$ | $\begin{array}{\|r} \hline 0 \\ 14 \\ \hline \end{array}$ | $4^{1}$ | 33 | $\begin{array}{\|l} \hline \mathbf{1 3} \\ \mathbf{4 5} \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 35 \\ 19 \\ \hline \end{array}$ | $\begin{array}{r} 58 \\ \hline 4 \\ \hline \end{array}$ | 42 | 18 | $\begin{aligned} & \hline 10 \\ & 44 \\ & \hline \end{aligned}$ | $\begin{array}{\|r} 7 \\ 33 \\ \hline \end{array}$ | $\begin{array}{\|r} \hline 51 \\ 5 \\ \hline \end{array}$ | 50 |
| 51 |  | 14 | $\begin{array}{\|l} \mathbf{4 1} \\ 47 \\ \hline \end{array}$ | $\begin{array}{\|l} 29 \\ 31 \\ \hline \end{array}$ | $\begin{aligned} & 13 \\ & 18 \end{aligned}$ |  | 1 | $\begin{array}{\|l} 51 \\ 46 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 28 \\ 47 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 40 \\ 49 \\ \hline \end{array}$ |  | 48 | $\begin{aligned} & \mathbf{1 7} \\ & 46 \\ & \hline \end{aligned}$ | $\begin{array}{r} 34 \\ \hline \\ \hline \end{array}$ | $\begin{array}{\|l} 14 \\ 30 \\ \hline \end{array}$ |  | 33 | $\begin{aligned} & 58 \\ & 45 \\ & \hline \end{aligned}$ | $\begin{aligned} & 55 \\ & 18 \end{aligned}$ | $\begin{array}{\|r} \hline 2 \\ 19 \\ \hline \end{array}$ |  | 18 | $\begin{aligned} & 54 \\ & 44 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 40 \\ 32 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 56 \\ 19 \\ \hline \end{array}$ | 51 |
| 52 |  | 15 | $\begin{array}{\|l} \hline 29 \\ 47 \\ \hline \end{array}$ | $\begin{array}{\|r} \hline \mathbf{o} \\ 30 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline \mathbf{3 1} \\ \mathbf{3 4} \\ \hline \end{array}$ |  | 2 | $\begin{aligned} & 38 \\ & 4^{6} \end{aligned}$ | $\begin{array}{\|l\|} \hline 16 \\ 47 \\ \hline \end{array}$ | $\begin{array}{r} 29 \\ 5 \\ \hline \end{array}$ |  | 49 | $\begin{array}{r} 3 \\ 46 \\ \hline \end{array}$ | $\begin{array}{r} 37 \\ 2 \end{array}$ | $\begin{array}{\|l\|} \hline 44 \\ 44 \\ \hline \end{array}$ |  | 34 | $\begin{aligned} & 44 \\ & 45 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 13 \\ 17 \\ \hline \end{array}$ | $33$ |  | 19 | $\begin{aligned} & 39 \\ & 44 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 13 \\ 3^{1} \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 15 \\ 32 \\ \hline \end{array}$ | 52 |
| 53 |  | 16 | $\begin{array}{\|l\|} \hline \mathbf{1 6} \\ 47 \\ \hline \end{array}$ | $\begin{aligned} & \hline \mathbf{3 1} \\ & \mathbf{2 9} \\ & \hline \end{aligned}$ | $\begin{array}{r} 5 \\ 52 \\ \hline \end{array}$ |  | 3 | $\begin{aligned} & 25 \\ & 46 \end{aligned}$ | $\begin{array}{\|r} 3 \\ 4^{6} \\ \hline \end{array}$ | $\begin{aligned} & 34 \\ & 21 \\ & \hline \end{aligned}$ |  | 49 | $\begin{array}{\|l} \hline 49 \\ 46 \\ \hline \end{array}$ | $\begin{array}{r} 40 \\ 20 \\ \hline \end{array}$ | $\begin{gathered} 28 \\ 0 \end{gathered}$ |  | 35 | $\begin{array}{\|l} \hline 29 \\ 45 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 30 \\ 16 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 54 \\ 48 \\ \hline \end{array}$ |  | 20 | $\begin{aligned} & 23 \\ & 44 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 44 \\ 30 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 47 \\ 46 \\ \hline \end{array}$ | 53 |
| 54 |  | 17 | $\begin{array}{r} 4 \\ 47 \\ \hline \end{array}$ | $\begin{array}{r} \mathbf{o} \\ 29 \\ \hline \end{array}$ | $\begin{array}{r} 57 \\ 8 \end{array}$ |  | 4 | $\begin{array}{\|l\|} \mathbf{1 1} \\ 46 \\ \hline \end{array}$ | $\begin{array}{\|l} 49 \\ 45 \\ \hline \end{array}$ | $\begin{aligned} & 55 \\ & 37 \\ & \hline \end{aligned}$ |  | 50 | $\begin{array}{\|l\|} \hline 35 \\ 46 \\ \hline \end{array}$ | $42$ | $\begin{array}{\|l\|} \hline 28 \\ 15 \\ \hline \end{array}$ |  | 36 | $\begin{array}{\|l} \mathbf{1 4} \\ 45 \\ \hline \end{array}$ | $\begin{aligned} & 47 \\ & 16 \\ & \hline \end{aligned}$ | $\begin{array}{r} 42 \\ 2 \end{array}$ |  | 21 | $\begin{array}{\|r\|} \hline 8 \\ 44 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 15 \\ 30 \\ \hline \end{array}$ | $\begin{gathered} 33 \\ 0 \end{gathered}$ | 54 |
| 55 |  | 17 | $\begin{aligned} & \mathbf{5 1} \\ & 47 \\ & \hline \end{aligned}$ | $\begin{aligned} & 30 \\ & 28 \end{aligned}$ | $\begin{array}{r} 5 \\ 26 \\ \hline \end{array}$ |  | 4 | $\begin{aligned} & 58 \\ & 46 \end{aligned}$ | $\begin{array}{\|l\|} \hline 35 \\ 44 \\ \hline \end{array}$ | $\begin{aligned} & \hline \mathbf{3 2}^{2} \\ & 54 \\ & \hline \end{aligned}$ |  | 51 | $\begin{array}{\|l\|} \hline 21 \\ 46 \\ \hline \end{array}$ | $\begin{array}{r} 43 \\ 0 \end{array}$ | $\begin{aligned} & 43 \\ & 30 \end{aligned}$ |  | 37 | $\begin{array}{\|r} \hline \mathbf{o} \\ 45 \\ \hline \end{array}$ | $\begin{array}{\|r} \hline 3 \\ 15 \\ \hline \end{array}$ | $\begin{aligned} & 44 \\ & 16 \end{aligned}$ |  | 21 | $\begin{array}{\|l} 5^{2} \\ 44 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 45 \\ 29 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 33 \\ 13 \\ \hline \end{array}$ | 55 |
| 56 |  | 18 | $\begin{aligned} & 38 \\ & 47 \\ & \hline \end{aligned}$ | $\begin{aligned} & 58 \\ & 27 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 31 \\ 42 \\ \hline \end{array}$ |  | 5 | $\begin{aligned} & 45 \\ & 46 \\ & \hline \end{aligned}$ | $\begin{aligned} & 20 \\ & 44 \\ & \hline \end{aligned}$ | $\begin{array}{r} 26 \\ \hline 9 \\ \hline \end{array}$ |  | 52 | $\begin{array}{\|r} 7 \\ 45 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 44 \\ 59 \\ \hline \end{array}$ | $\begin{array}{\|l} 13 \\ 45 \\ \hline \end{array}$ |  | 37 | $\begin{array}{\|l} 45 \\ 45 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 19 \\ 14 \\ \hline \end{array}$ | $\begin{array}{r} \mathbf{0} \\ 3^{1} \\ \hline \end{array}$ |  | 22 | $\begin{aligned} & 37 \\ & 44 \\ & \hline \end{aligned}$ | $\begin{aligned} & 14 \\ & 28 \end{aligned}$ | $\begin{aligned} & 46 \\ & 26 \end{aligned}$ | 56 |
| 57 |  | 19 | $\begin{array}{\|l\|} \hline 26 \\ 47 \\ \hline \end{array}$ | $\begin{aligned} & 26 \\ & 26 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 13 \\ 59 \\ \hline \end{array}$ |  | 6 | $\begin{aligned} & 32 \\ & 46 \\ & \hline \end{aligned}$ | $\begin{array}{r} 4 \\ 43 \\ \hline \end{array}$ | $\begin{aligned} & 35 \\ & 26 \end{aligned}$ |  | 52 | $\begin{array}{\|l} 53 \\ 45 \\ \hline \end{array}$ | $\begin{array}{\|l} 43 \\ 59 \\ \hline \end{array}$ | $\begin{gathered} 58 \\ 0 \end{gathered}$ |  | 38 | $\begin{array}{\|l} 30 \\ 45 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 33 \\ 13 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline \mathbf{3 1} \\ 45 \\ \hline \end{array}$ |  | 23 | $\begin{array}{\|l\|} \mathbf{2 1} \\ 44 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 43 \\ 27 \\ \hline \end{array}$ | $\begin{array}{\|l} 12 \\ 40 \\ \hline \end{array}$ | 57 |
| 58 |  | 20 | $\begin{aligned} & 13 \\ & 47 \\ & \hline \end{aligned}$ | $\begin{aligned} & 53 \\ & 26 \\ & \hline \end{aligned}$ | $\begin{aligned} & 12 \\ & 16 \end{aligned}$ |  | 7 | $\begin{aligned} & 18 \\ & 46 \end{aligned}$ | $\begin{aligned} & 4^{8} \\ & 4^{2} \\ & \hline \end{aligned}$ | $\begin{array}{\|r} \hline 1 \\ 41 \\ \hline \end{array}$ |  | 53 | $\begin{array}{\|l\|} \hline 39 \\ 45 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline \mathbf{4 2} \\ 58 \\ \hline \end{array}$ | $\begin{aligned} & 58 \\ & 16 \end{aligned}$ |  | 39 | $\begin{aligned} & 15 \\ & 45 \\ & \hline \end{aligned}$ | $\begin{aligned} & 47 \\ & 12 \end{aligned}$ | $\begin{array}{\|l} \hline 16 \\ 59 \\ \hline \end{array}$ |  | 24 | $\begin{array}{r} 6 \\ 44 \\ \hline \end{array}$ | $\begin{aligned} & 10 \\ & 26 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline \mathbf{5 2}^{2} \\ 54 \\ \hline \end{array}$ | 58 |
| 59 |  | 21 | $\begin{array}{\|r} \mathbf{1} \\ 47 \\ \hline \end{array}$ | $\begin{aligned} & 19 \\ & 25 \\ & \hline \end{aligned}$ | $\begin{aligned} & 28 \\ & 33 \end{aligned}$ |  | 8 | $\begin{array}{r} 5 \\ 46 \\ \hline \end{array}$ | $\begin{aligned} & 30 \\ & 41 \end{aligned}$ | $\begin{aligned} & 42 \\ & 58 \\ & \hline \end{aligned}$ |  | 54 | $\begin{aligned} & 25 \\ & 45 \end{aligned}$ | $\begin{array}{\|l} \mathbf{4 1} \\ \mathbf{5 7} \\ \hline \end{array}$ | $\begin{array}{\|l\|} 14 \\ 31 \\ \hline \end{array}$ |  | 40 | $\begin{array}{\|r} \mathbf{1} \\ 45 \\ \hline \end{array}$ | $\begin{array}{r} 0 \\ 12 \end{array}$ | $\begin{array}{\|l} 15 \\ 14 \\ \hline \end{array}$ |  | 24 | $\begin{array}{\|l} 50 \\ 44 \end{array}$ | $\begin{array}{\|l} 37 \\ 26 \\ \hline \end{array}$ | $\begin{array}{r} 46 \\ 7 \end{array}$ | 59 |
| 60 | 39 | 21 | $\begin{aligned} & 48 \\ & 47 \\ & \hline \end{aligned}$ | $\begin{aligned} & 45 \\ & 24 \end{aligned}$ | $\begin{array}{\|r} 1 \\ 50 \\ \hline \end{array}$ | 40 | 8 | $\begin{aligned} & 52 \\ & 46 \end{aligned}$ | $\begin{aligned} & 12 \\ & 41 \end{aligned}$ | $\begin{aligned} & 40 \\ & 10 \end{aligned}$ | 40 | 55 | $\begin{array}{\|l} \mathbf{1 1} \\ 45 \\ \hline \end{array}$ | $\begin{aligned} & 38 \\ & 56 \end{aligned}$ | $\begin{aligned} & 45 \\ & 46 \end{aligned}$ | $4^{1}$ | 40 | $\begin{aligned} & 46 \\ & 45 \end{aligned}$ | $\begin{aligned} & 12 \\ & 11 \end{aligned}$ | $\begin{aligned} & 29 \\ & 28 \end{aligned}$ | $4^{2}$ | 25 | $\begin{aligned} & 35 \\ & 44 \end{aligned}$ | $\begin{array}{r} 3 \\ 25 \\ \hline \end{array}$ | $\begin{aligned} & 53 \\ & 21 \end{aligned}$ | 60 |

Bürgi's 1' sine table (reconstruction, D. Roegel, 2016)

| , | $45^{\circ}$ |  |  |  |  | $46^{\circ}$ |  |  |  |  | $47^{\circ}$ |  |  |  |  | $48^{\circ}$ |  |  |  |  | $49^{\circ}$ |  |  |  |  | $\begin{gathered} \prime \\ \hline 0 \end{gathered}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 0 | 42 | 25 | $\begin{array}{\|l\|} \hline 35 \\ 44 \\ \hline \end{array}$ | $\begin{array}{r} 3 \\ 25 \\ \hline \end{array}$ | $\begin{aligned} & 53 \\ & 21 \end{aligned}$ | 43 | 9 | $\begin{aligned} & 37 \\ & 43 \end{aligned}$ | $\begin{aligned} & 23 \\ & 38 \\ & \hline \end{aligned}$ | $\begin{aligned} & 49 \\ & 24 \end{aligned}$ | 43 | 52 | $\begin{aligned} & 52 \\ & 42 \\ & \hline \end{aligned}$ | $\begin{aligned} & 23 \\ & 50 \end{aligned}$ | $\begin{aligned} & 58 \\ & 41 \\ & \hline \end{aligned}$ | 44 | 35 | $\begin{aligned} & 19 \\ & 42 \\ & \hline \end{aligned}$ | $\begin{array}{r} 16 \\ 2 \end{array}$ | $\begin{aligned} & \hline 56 \\ & 10 \end{aligned}$ | 45 | 16 | $\begin{array}{\|l} \hline 57 \\ 41 \\ \hline \end{array}$ | $\begin{aligned} & 16 \\ & 12 \end{aligned}$ | $\begin{aligned} & 10 \\ & 52 \end{aligned}$ |  |
| 1 |  | 26 | $\begin{array}{\|l\|} \hline 19 \\ 44 \\ \hline \end{array}$ | $\begin{aligned} & 29 \\ & 24 \end{aligned}$ | $\begin{array}{\|l\|} \hline 14 \\ 34 \\ \hline \end{array}$ |  | 10 | $\begin{array}{\|l\|} \hline 21 \\ 43 \\ \hline \end{array}$ | $\begin{array}{r} \mathbf{2} \\ 37 \\ \hline \end{array}$ | $\begin{array}{\|l} \mathbf{1 3} \\ \mathbf{3 7} \\ \hline \end{array}$ |  | 53 | $\begin{array}{r} 35 \\ 4^{2} \\ \hline \end{array}$ | $\begin{array}{\|l} \mathbf{1 4} \\ \mathbf{4 9} \\ \hline \end{array}$ | $\begin{aligned} & 39 \\ & 52 \end{aligned}$ |  | 36 | $\begin{array}{r}1 \\ 42 \\ \hline\end{array}$ | 19 <br> 1 | 6 20 |  | 17 | 38 41 | 29 <br> 12 | $\begin{aligned} & 2 \\ & 2 \\ & \hline \end{aligned}$ | 1 |
| 2 |  | 27 | $\begin{array}{r} 3 \\ 44 \\ \hline \end{array}$ | $\begin{array}{\|l} 53 \\ 23 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 48 \\ 47 \\ \hline \end{array}$ |  | 11 | $\begin{array}{r} 4 \\ 43 \\ \hline \end{array}$ | $\begin{aligned} & 39 \\ & 36 \\ & \hline \end{aligned}$ | $\begin{aligned} & 50 \\ & 50 \\ & \hline \end{aligned}$ |  | 54 | $\begin{array}{\|l\|} \hline 18 \\ 42 \\ \hline \end{array}$ | $\begin{array}{r} 4 \\ 49 \\ \hline \end{array}$ | $\begin{array}{r} 31 \\ \hline \\ \hline \end{array}$ |  | 36 | $\begin{aligned} & 43 \\ & 42 \\ & \hline \end{aligned}$ | $\begin{gathered} 20 \\ 0 \end{gathered}$ | $\begin{array}{\|l\|} \hline 26 \\ 32 \\ \hline \end{array}$ |  | 18 | $\begin{array}{\|l\|} \hline 19 \\ 41 \\ \hline \end{array}$ | $\begin{aligned} & \hline \mathbf{4 1} \\ & \mathbf{1 1} \end{aligned}$ | $\begin{array}{r} 4 \\ 13 \\ \hline \end{array}$ |  |
| 3 |  | 27 | $\begin{array}{\|l\|} \hline 48 \\ 44 \\ \hline \end{array}$ | $\begin{array}{\|l} 17 \\ 23 \\ \hline \end{array}$ | $\begin{array}{r} 35 \\ 1 \end{array}$ |  | 11 | $\begin{aligned} & 48 \\ & 43 \end{aligned}$ | $\begin{aligned} & \hline 16 \\ & 36 \\ & \hline \end{aligned}$ | $\begin{array}{r} 40 \\ 2 \end{array}$ |  | 55 | $\begin{array}{r} \hline 0 \\ 4^{2} \\ \hline \end{array}$ | $\begin{aligned} & 53 \\ & 48 \\ & \hline \end{aligned}$ | $\begin{aligned} & 35 \\ & 16 \end{aligned}$ |  | 37 | $\begin{array}{\|l} 25 \\ 41 \\ \hline \end{array}$ | $\begin{array}{\|l} 20 \\ 59 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 58 \\ 42 \\ \hline \end{array}$ |  | 19 | $\begin{array}{\|r} \hline \mathbf{0} \\ 41 \\ \hline \end{array}$ | $\begin{aligned} & 52 \\ & 10 \end{aligned}$ | $\begin{array}{\|l} 17 \\ 23 \\ \hline \end{array}$ | 3 |
| 4 |  | 28 | $\begin{array}{\|l\|} \hline \mathbf{3 2} \\ 44 \\ \hline \end{array}$ | $\begin{aligned} & 40 \\ & 22 \end{aligned}$ | $\begin{aligned} & 36 \\ & 14 \\ & \hline \end{aligned}$ |  | 12 | $\begin{array}{\|l} \mathbf{3 1} \\ 43 \end{array}$ | $\begin{aligned} & 5^{2} \\ & 35 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 42 \\ 15 \\ \hline \end{array}$ |  | 55 | $\begin{array}{\|l} 43 \\ 42 \end{array}$ | $\begin{array}{\|l} \mathbf{4 1} \\ \mathbf{4 7} \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{5 1} \\ & \mathbf{2 8} \end{aligned}$ |  | $3^{8}$ | $\begin{array}{r} 7 \\ 4^{1} \\ \hline \end{array}$ | $\begin{aligned} & 20 \\ & 58 \\ & \hline \end{aligned}$ | $\begin{aligned} & 40 \\ & 54 \end{aligned}$ |  | 19 | $\begin{array}{\|l} 42 \\ 41 \\ \hline \end{array}$ | $\begin{aligned} & 2 \\ & 9 \\ & \hline \end{aligned}$ | $\begin{aligned} & 40 \\ & 34 \end{aligned}$ | 4 |
| 5 |  | 29 | $\begin{array}{\|l\|} \hline \mathbf{1 7} \\ \mathbf{4 4} \\ \hline \end{array}$ | $\begin{array}{r} 2 \\ 21 \\ \hline \end{array}$ | $\begin{aligned} & 50 \\ & 28 \end{aligned}$ |  | 13 | $\begin{aligned} & 15 \\ & 43 \\ & \hline \end{aligned}$ | $\begin{aligned} & 27 \\ & 34 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 57 \\ 27 \\ \hline \end{array}$ |  | 56 | $\begin{aligned} & 26 \\ & 42 \\ & \hline \end{aligned}$ | $\begin{aligned} & 29 \\ & 46 \\ & \hline \end{aligned}$ | $\begin{aligned} & \mathbf{1 9} \\ & 39 \end{aligned}$ |  | $3^{8}$ | $\begin{array}{\|l} 49 \\ 41 \\ \hline \end{array}$ | $\begin{array}{\|l} 19 \\ 58 \\ \hline \end{array}$ | $34$ |  | 20 | $\begin{aligned} & 23 \\ & 41 \\ & \hline \end{aligned}$ | $\begin{array}{r} 12 \\ 8 \end{array}$ | $\begin{array}{\|l} \mathbf{1 4} \\ 44 \\ \hline \end{array}$ | 5 |
| 6 |  | 30 | $\begin{array}{\|r\|} \hline \mathbf{1} \\ 44 \\ \hline \end{array}$ | $\begin{aligned} & 24 \\ & 20 \end{aligned}$ | $\begin{array}{\|l\|} \hline 18 \\ 41 \\ \hline \end{array}$ |  | 13 | $\begin{array}{\|l} 59 \\ 43 \\ \hline \end{array}$ | $\begin{array}{\|r} \hline \mathbf{2} \\ 33 \\ \hline \end{array}$ | $\begin{array}{\|l} 24 \\ 4^{1} \\ \hline \end{array}$ |  | 57 | $\begin{array}{r} 9 \\ 4^{2} \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 15 \\ 45 \\ \hline \end{array}$ | $\begin{aligned} & 58 \\ & 51 \\ & \hline \end{aligned}$ |  | 39 | $\begin{aligned} & \hline 31 \\ & 4^{1} \\ & \hline \end{aligned}$ | $\begin{aligned} & \mathbf{1 7} \\ & 57 \\ & \hline \end{aligned}$ | $\begin{aligned} & 38 \\ & 16 \end{aligned}$ |  | 21 | $\begin{array}{r} 4 \\ 41 \\ \hline \end{array}$ | $\begin{array}{r} 20 \\ \hline 7 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 58 \\ 54 \\ \hline \end{array}$ | 6 |
| 7 |  | 30 | $\begin{array}{\|l\|} \hline 45 \\ 44 \\ \hline \end{array}$ | $\begin{aligned} & 44 \\ & 19 \end{aligned}$ | $\begin{aligned} & 59 \\ & 54 \\ & \hline \end{aligned}$ |  | 14 | $\begin{aligned} & 42 \\ & 43 \\ & \hline \end{aligned}$ | $\begin{aligned} & 36 \\ & 32 \end{aligned}$ | $\begin{array}{r} 5 \\ 5^{2} \end{array}$ |  | 57 | $\begin{aligned} & 52 \\ & 42 \\ & \hline \end{aligned}$ | $\begin{array}{r} 1 \\ 45 \\ \hline \end{array}$ | $\begin{array}{r} 49 \\ 4 \end{array}$ |  | 40 | $\begin{array}{\|l\|} 13 \\ 4^{1} \\ \hline \end{array}$ | $\begin{aligned} & 14 \\ & 56 \end{aligned}$ | $\begin{array}{\|l\|} \hline 54 \\ 27 \end{array}$ |  | 21 | $\begin{aligned} & 45 \\ & 41 \end{aligned}$ | $\begin{array}{r} 28 \\ \hline 7 \\ \hline \end{array}$ | $\begin{array}{\|r} \hline 52 \\ 4 \\ \hline \end{array}$ | 7 |
| 8 |  | 31 | $\begin{array}{\|l\|} \hline 30 \\ 44 \\ \hline \end{array}$ | $\begin{array}{r} 4 \\ 19 \\ \hline \end{array}$ | $\begin{array}{r} 53 \\ 8 \end{array}$ |  | 15 | $\begin{aligned} & \mathbf{2 6} \\ & 43 \end{aligned}$ | $\begin{array}{r} 8 \\ 32 \\ \hline \end{array}$ | $\begin{array}{r} 57 \\ 5 \\ \hline \end{array}$ |  | 58 | $\begin{aligned} & 34 \\ & 42 \\ & \hline \end{aligned}$ | $\begin{aligned} & 46 \\ & 44 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 53 \\ 14 \\ \hline \end{array}$ |  | 40 | $\begin{array}{\|l} 55 \\ 41 \\ \hline \end{array}$ | $\begin{aligned} & 11 \\ & 55 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 21 \\ 37 \\ \hline \end{array}$ |  | 22 | $\begin{array}{\|l\|} \hline 26 \\ 41 \\ \hline \end{array}$ | $\begin{array}{r} 35 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 56 \\ 14 \\ \hline \end{array}$ | 8 |
| 9 |  | 32 | $\begin{array}{\|l} \mathbf{1 4} \\ \mathbf{4 4} \\ \hline \end{array}$ | $\begin{aligned} & 24 \\ & 18 \end{aligned}$ | $\begin{array}{\|r} 1 \\ 21 \end{array}$ |  | 16 | $\begin{array}{r} 9 \\ 43 \end{array}$ | $\begin{aligned} & 41 \\ & 31 \\ & \hline \end{aligned}$ | $\begin{array}{r} 2 \\ 18 \end{array}$ |  | 59 | $\begin{aligned} & \mathbf{1 7} \\ & \mathbf{4 2} \end{aligned}$ | $\begin{array}{\|l} \mathbf{3 1} \\ 43 \\ \hline \end{array}$ | $\begin{array}{r} 7 \\ 27 \\ \hline \end{array}$ |  | 41 | $\begin{aligned} & 37 \\ & 41 \end{aligned}$ | $\begin{array}{r} 6 \\ 54 \end{array}$ | $\begin{aligned} & 58 \\ & 49 \end{aligned}$ |  | 23 | $\begin{array}{r} 7 \\ 4^{1} \\ \hline \end{array}$ | $\begin{array}{r} 42 \\ 5 \\ \hline \end{array}$ | $\begin{array}{\|l} \mathbf{1 0} \\ \mathbf{2 5} \\ \hline \end{array}$ | 9 |
| 10 | 42 | 32 | $\begin{aligned} & 58 \\ & 44 \\ & \hline \end{aligned}$ | $\begin{aligned} & 42 \\ & 17 \end{aligned}$ | $\begin{aligned} & 22 \\ & 35 \end{aligned}$ | 43 | 16 | $\begin{array}{\|l} 53 \\ 43 \\ \hline \end{array}$ | $\begin{aligned} & 12 \\ & 30 \end{aligned}$ | $\begin{aligned} & 20 \\ & 31 \\ & \hline \end{aligned}$ | 44 | 0 | $\begin{array}{r} 10 \\ 4^{2} \\ \hline \end{array}$ | $\begin{array}{\|l} 14 \\ 4^{2} \\ \hline \end{array}$ | $\begin{aligned} & 34 \\ & 38 \\ & \hline \end{aligned}$ | 44 | 42 | $\begin{array}{\|l} 19 \\ 41 \\ \hline \end{array}$ | $54$ | $\begin{array}{r} 47 \\ 0 \end{array}$ | 45 | 23 | $\begin{array}{\|l} \hline 48 \\ 41 \\ \hline \end{array}$ | $\begin{array}{r} 47 \\ \hline \end{array}$ | $\begin{aligned} & 35 \\ & 35 \\ & \hline \end{aligned}$ |  |
| 11 |  | 33 | $\begin{array}{\|l} \hline \mathbf{4 2} \\ 44 \\ \hline \end{array}$ | $\begin{aligned} & 59 \\ & 16 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 57 \\ 48 \\ \hline \end{array}$ |  | 17 | $\begin{aligned} & 36 \\ & 43 \end{aligned}$ | $\begin{aligned} & 42 \\ & 29 \\ & \hline \end{aligned}$ | $\begin{aligned} & 5^{1} \\ & 4^{2} \\ & \hline \end{aligned}$ |  | 0 | $\begin{aligned} & 4^{2} \\ & 42 \\ & \hline \end{aligned}$ | $\begin{aligned} & 57 \\ & 41 \\ & \hline \end{aligned}$ | $\begin{aligned} & 12 \\ & 51 \\ & \hline \end{aligned}$ |  | 43 | $\begin{array}{r} \hline 0 \\ 4^{1} \\ \hline \end{array}$ | $\begin{aligned} & 55 \\ & 53 \\ & \hline \end{aligned}$ | $\begin{aligned} & 47 \\ & 10 \\ & \hline \end{aligned}$ |  | 24 | $\begin{array}{\|l\|} \hline 29 \\ 41 \\ \hline \end{array}$ | $\begin{array}{r} 52 \\ \hline 3 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline \mathbf{1 0} \\ \mathbf{4 5} \\ \hline \end{array}$ |  |
| 12 |  | 34 | $\begin{array}{\|l\|} \hline 27 \\ 44 \\ \hline \end{array}$ | $\begin{aligned} & 16 \\ & 16 \\ & \hline \end{aligned}$ | $\begin{gathered} 45 \\ 1 \end{gathered}$ |  | 18 | $\begin{aligned} & 20 \\ & 43 \end{aligned}$ | $\begin{aligned} & 12 \\ & 28 \end{aligned}$ | $\begin{aligned} & 33 \\ & 56 \end{aligned}$ |  | 1 | $\begin{array}{r} 25 \\ 4^{2} \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 39 \\ 41 \\ \hline \end{array}$ | $\begin{aligned} & 3 \\ & 1 \end{aligned}$ |  | 43 | $\begin{array}{\|l} 42 \\ 41 \\ \hline \end{array}$ | $\begin{aligned} & 48 \\ & 5^{2} \end{aligned}$ | $\begin{aligned} & 57 \\ & 22 \end{aligned}$ |  | 25 | $\begin{array}{\|l\|} \hline 10 \\ 41 \\ \hline \end{array}$ | $55$ | $\begin{array}{\|l} 55 \\ 56 \\ \hline \end{array}$ |  |
| 13 |  | 35 | $\begin{array}{\|l\|} \hline \mathbf{1 1} \\ 44 \\ \hline \end{array}$ | $\begin{aligned} & 32 \\ & 15 \\ & \hline \end{aligned}$ | $\begin{aligned} & \hline 4^{6} \\ & 14 \\ & \hline \end{aligned}$ |  | 19 | $\begin{array}{r} 3 \\ 43 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{4 1} \\ & \mathbf{2 8} \end{aligned}$ | $\begin{array}{r} 29 \\ 8 \end{array}$ |  | 2 | $\begin{array}{r} 8 \\ 42 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 20 \\ 40 \\ \hline \end{array}$ | $\begin{array}{r} 4 \\ 14 \\ \hline \end{array}$ |  | 44 | $\begin{aligned} & 24 \\ & 41 \\ & \hline \end{aligned}$ | $\begin{aligned} & 41 \\ & 51 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 19 \\ 32 \\ \hline \end{array}$ |  | 25 | $\begin{array}{\|l\|} \hline 51 \\ 41 \\ \hline \end{array}$ | $\begin{array}{r} 58 \\ 2 \end{array}$ | $\begin{array}{\|r} \hline 51 \\ \hline \end{array}$ |  |
| 14 |  | 35 | $\begin{array}{\|l\|} \hline 55 \\ 44 \\ \hline \end{array}$ | $\begin{aligned} & 48 \\ & 14 \\ & \hline \end{aligned}$ | $\begin{array}{r} \mathbf{0} \\ 28 \\ \hline \end{array}$ |  | 19 | $\begin{array}{\|l} 47 \\ 43 \\ \hline \end{array}$ | $\begin{array}{\|r} \hline 9 \\ 27 \\ \hline \end{array}$ | $\begin{aligned} & 37 \\ & 20 \end{aligned}$ |  | 2 | $\begin{aligned} & 51 \\ & 4^{2} \\ & \hline \end{aligned}$ | $\begin{array}{r} \hline \mathbf{0} \\ 39 \\ \hline \end{array}$ | $\begin{aligned} & 18 \\ & 25 \\ & \hline \end{aligned}$ |  | 45 | $\begin{array}{\|r\|} \hline 6 \\ 4^{1} \\ \hline \end{array}$ | $\begin{aligned} & 3^{2} \\ & 50 \end{aligned}$ | $\begin{array}{\|l} \hline 51 \\ 44 \\ \hline \end{array}$ |  | 26 | $\begin{array}{\|l} \hline 33 \\ 41 \\ \hline \end{array}$ | $0$ | $\begin{aligned} & 56 \\ & 16 \end{aligned}$ |  |
| 15 |  | 36 | $\begin{array}{\|l\|} \hline \mathbf{4 0} \\ 44 \\ \hline \end{array}$ | $\begin{array}{r} 2 \\ 13 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 28 \\ 41 \\ \hline \end{array}$ |  | 20 | $\begin{array}{\|l} 30 \\ 43 \\ \hline \end{array}$ | $\begin{aligned} & 36 \\ & 26 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 57 \\ 33 \\ \hline \end{array}$ |  | 3 | $\begin{array}{r} 33 \\ 4^{2} \\ \hline \end{array}$ | $\begin{array}{\|l} 39 \\ 38 \\ \hline \end{array}$ | $\begin{aligned} & 43 \\ & 37 \\ & \hline \end{aligned}$ |  | 45 | $\begin{aligned} & 48 \\ & 41 \\ & \hline \end{aligned}$ | $\begin{array}{r} 23 \\ 49 \\ \hline \end{array}$ | $\begin{aligned} & 35 \\ & 54 \\ & \hline \end{aligned}$ |  | 27 | $\begin{array}{\|l} 14 \\ 41 \\ \hline \end{array}$ | $\begin{aligned} & 2 \\ & 0 \end{aligned}$ | $\begin{aligned} & 12 \\ & 26 \end{aligned}$ |  |
| 16 |  | 37 | $\begin{array}{\|l\|} \hline 24 \\ 44 \\ \hline \end{array}$ | $\begin{aligned} & 16 \\ & 12 \end{aligned}$ | $\begin{array}{r} 9 \\ 54 \\ \hline \end{array}$ |  | 21 | $\begin{array}{\|l} \mathbf{1 4} \\ 43 \\ \hline \end{array}$ | $\begin{array}{r} 3 \\ 25 \\ \hline \end{array}$ | $\begin{aligned} & 30 \\ & 45 \end{aligned}$ |  | 4 | $\begin{aligned} & 16 \\ & 42 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline \mathbf{1 8} \\ 37 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{2 0} \\ & 49 \end{aligned}$ |  | 46 | $\begin{aligned} & 30 \\ & 4^{1} \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \mathbf{1 3} \\ 49 \\ \hline \end{array}$ | $\begin{array}{r} 29 \\ 5 \end{array}$ |  | 27 | $\begin{array}{\|l\|} \hline 55 \\ 40 \\ \hline \end{array}$ | $\begin{array}{\|r} \hline \mathbf{2} \\ 59 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 38 \\ 36 \\ \hline \end{array}$ |  |
| 17 |  | 38 | $\begin{array}{\|r\|} \hline 8 \\ 44 \\ \hline \end{array}$ | $\begin{aligned} & 29 \\ & 12 \end{aligned}$ | $\begin{array}{r} 3 \\ 8 \\ \hline \end{array}$ |  | 21 | $\begin{aligned} & 57 \\ & 43 \\ & \hline \end{aligned}$ | $\begin{aligned} & 29 \\ & 24 \\ & \hline \end{aligned}$ | $\begin{aligned} & 15 \\ & 58 \end{aligned}$ |  | 4 | $\begin{aligned} & 58 \\ & 4^{2} \\ & \hline \end{aligned}$ | $\begin{aligned} & 56 \\ & 37 \\ & \hline \end{aligned}$ | $\begin{aligned} & 9 \\ & 0 \end{aligned}$ |  | 47 | $\begin{array}{\|l} 12 \\ 41 \\ \hline \end{array}$ | $\begin{array}{r} \hline 2 \\ 48 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 34 \\ 17 \\ \hline \end{array}$ |  | 28 | $\begin{array}{\|l} \hline 36 \\ 40 \\ \hline \end{array}$ | $\begin{array}{\|r} \mathbf{2} \\ 58 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 14 \\ 46 \end{array}$ |  |
| 18 |  | 38 | $\begin{array}{\|l\|} \hline \mathbf{5 2} \\ \mathbf{4 4} \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 41 \\ 11 \end{array}$ | $\begin{aligned} & 11 \\ & 21 \end{aligned}$ |  | 22 | $\begin{aligned} & 40 \\ & 43 \end{aligned}$ | $\begin{aligned} & 54 \\ & 24 \end{aligned}$ | $\begin{array}{\|l\|} \hline 13 \\ 10 \end{array}$ |  | 5 | $\begin{array}{r} 41 \\ 42 \\ \hline \end{array}$ | $\begin{array}{\|l} 33 \\ 36 \\ \hline \end{array}$ | $\begin{array}{r} 9 \\ 12 \end{array}$ |  | 47 | $\begin{array}{\|l} 53 \\ 41 \end{array}$ | $\begin{array}{\|l} 50 \\ 47 \\ \hline \end{array}$ | $\begin{array}{\|l} \mathbf{5 1} \\ \mathbf{2 7} \\ \hline \end{array}$ |  | 29 | $\begin{aligned} & 17 \\ & 40 \end{aligned}$ | $\begin{array}{\|r} \mathbf{1} \\ 57 \\ \hline \end{array}$ | $\begin{array}{r} \mathrm{o} \\ 56 \end{array}$ |  |
| 19 |  | 39 | $\begin{array}{\|l\|} \hline \mathbf{3 6} \\ 44 \\ \hline \end{array}$ | $\begin{aligned} & 5^{2} \\ & 10 \end{aligned}$ | $\begin{array}{\|l\|} \hline 32 \\ 34 \\ \hline \end{array}$ |  | 23 | $\begin{array}{\|l} 24 \\ 43 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 18 \\ 23 \\ \hline \end{array}$ | $\begin{array}{\|l} 23 \\ 22 \end{array}$ |  | 6 | $\begin{array}{r} 24 \\ 4^{2} \\ \hline \end{array}$ | $\begin{array}{r} 9 \\ 35 \\ \hline \end{array}$ | $\begin{aligned} & 21 \\ & 24 \\ & \hline \end{aligned}$ |  | 48 | $\begin{aligned} & 35 \\ & 41 \\ & \hline \end{aligned}$ | $\begin{aligned} & 38 \\ & 46 \end{aligned}$ | $\begin{array}{\|l\|} \hline 18 \\ 37 \\ \hline \end{array}$ |  | 29 | $\begin{array}{\|l} \hline 57 \\ 40 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 58 \\ 57 \\ \hline \end{array}$ | $\begin{array}{r} 56 \\ \hline 6 \end{array}$ |  |
| 20 | 42 | 40 | $\begin{array}{\|l\|} \hline \mathbf{2 1} \\ 44 \\ \hline \end{array}$ | $\begin{aligned} & 3 \\ & 9 \\ & \hline \end{aligned}$ | $\begin{array}{r} 6 \\ 47 \end{array}$ | 43 | 24 | $\begin{array}{r} 7 \\ 43 \\ \hline \end{array}$ | $\begin{aligned} & \hline 41 \\ & 22 \end{aligned}$ | $\begin{aligned} & 45 \\ & 35 \\ & \hline \end{aligned}$ | 44 | 7 | $\begin{array}{r} 6 \\ 42 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 44 \\ 34 \\ \hline \end{array}$ | $\begin{aligned} & 45 \\ & 35 \end{aligned}$ | 44 | 49 | $\begin{array}{\|l} 17 \\ 4^{1} \\ \hline \end{array}$ | $\begin{array}{\|} 24 \\ 45 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 55 \\ 49 \\ \hline \end{array}$ | 45 | 30 | $\begin{array}{\|l} \hline 38 \\ 40 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 56 \\ 56 \\ \hline \end{array}$ | $\begin{array}{\|r} \hline 2 \\ 17 \\ \hline \end{array}$ |  |
| 21 |  | 41 | $\begin{array}{\|r\|} \hline 5 \\ 44 \\ \hline \end{array}$ | $\begin{array}{r} 12 \\ \hline 9 \\ \hline \end{array}$ | $\begin{array}{\|r} 53 \\ 0 \end{array}$ |  | 24 | $\begin{array}{\|l\|} \hline 51 \\ 43 \\ \hline \end{array}$ | $\begin{array}{r} 4 \\ 21 \\ \hline \end{array}$ | $\begin{aligned} & 20 \\ & 48 \\ & \hline \end{aligned}$ |  | 7 | $\begin{aligned} & 49 \\ & 42 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 19 \\ 33 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 20 \\ 47 \\ \hline \end{array}$ |  | 49 | $\begin{aligned} & 59 \\ & 41 \\ & \hline \end{aligned}$ | $\begin{aligned} & 10 \\ & 45 \\ & \hline \end{aligned}$ | $\begin{gathered} 44 \\ 0 \end{gathered}$ |  | 31 | $\begin{array}{\|l\|} \hline 19 \\ 40 \\ \hline \end{array}$ | $\begin{aligned} & 52 \\ & 55 \\ & \hline \end{aligned}$ | $\begin{aligned} & 19 \\ & 26 \end{aligned}$ |  |
| 22 |  | 41 | $\begin{array}{\|l\|} \hline 49 \\ 44 \end{array}$ | $\begin{array}{r} 21 \\ 8 \end{array}$ | $\begin{array}{\|l} 53 \\ 14 \\ \hline \end{array}$ |  | 25 | $\begin{aligned} & \hline 34 \\ & 43 \end{aligned}$ | $\begin{aligned} & 26 \\ & 20 \end{aligned}$ | $\begin{array}{r} 8 \\ 59 \end{array}$ |  | 8 | $\begin{aligned} & \mathbf{3 1} \\ & 42 \end{aligned}$ | $\begin{array}{\|l} 53 \\ 32 \\ \hline \end{array}$ | $\begin{array}{r} 7 \\ 58 \end{array}$ |  | 50 | $\begin{aligned} & 40 \\ & 41 \end{aligned}$ | $\begin{aligned} & 55 \\ & 44 \end{aligned}$ | $\begin{aligned} & 44 \\ & 10 \end{aligned}$ |  | 32 | $\begin{array}{r} 0 \\ 40 \\ \hline \end{array}$ | $\begin{aligned} & 47 \\ & 54 \end{aligned}$ | $\begin{array}{\|l} 45 \\ 37 \end{array}$ |  |
| 23 |  | 42 | $\begin{aligned} & 33 \\ & 44 \\ & \hline \end{aligned}$ | $\begin{array}{r} 30 \\ \hline \end{array}$ | $\begin{array}{r} 7 \\ 26 \end{array}$ |  | 26 | $\begin{array}{r} 17 \\ 43 \\ \hline \end{array}$ | $\begin{aligned} & 47 \\ & 20 \end{aligned}$ | $\begin{array}{r} 7 \\ 12 \end{array}$ |  | 9 | $\begin{array}{\|l} \hline 14 \\ 42 \\ \hline \end{array}$ | $\begin{aligned} & 26 \\ & 32 \end{aligned}$ | $\begin{array}{r} 5 \\ 10 \end{array}$ |  | $5^{1}$ | $\begin{array}{\|l} 22 \\ 41 \\ \hline \end{array}$ | $\begin{aligned} & 39 \\ & 43 \end{aligned}$ | $\begin{aligned} & 54 \\ & 21 \end{aligned}$ |  | 32 | $\begin{array}{\|l} 4^{1} \\ 40 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 42 \\ 53 \\ \hline \end{array}$ | $\begin{array}{\|l} \mathbf{2 2} \\ 47 \end{array}$ |  |
| 24 |  | 43 | $\begin{array}{\|l\|} \hline \mathbf{1 7} \\ \mathbf{4 4} \\ \hline \end{array}$ | $\begin{array}{r} 37 \\ 6 \end{array}$ | $\begin{array}{\|l\|} \hline 33 \\ 40 \\ \hline \end{array}$ |  | 27 | $\begin{array}{r} \mathbf{1} \\ 43 \\ \hline \end{array}$ | $\begin{array}{r} 7 \\ 19 \\ \hline \end{array}$ | $\begin{aligned} & 19 \\ & 25 \\ & \hline \end{aligned}$ |  | 9 | $\begin{aligned} & \hline 56 \\ & 42 \\ & \hline \end{aligned}$ | $\begin{aligned} & 5^{8} \\ & 31 \\ & \hline \end{aligned}$ | $\begin{aligned} & 15 \\ & 21 \end{aligned}$ |  | 52 | $\begin{array}{r} 4 \\ 41 \\ \hline \end{array}$ | $\begin{aligned} & 23 \\ & 42 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 15 \\ 3^{2} \\ \hline \end{array}$ |  | 33 | $\begin{array}{\|l} \hline 22 \\ 40 \\ \hline \end{array}$ | $\begin{aligned} & 36 \\ & 5^{2} \\ & \hline \end{aligned}$ | $\begin{array}{r} 9 \\ 56 \\ \hline \end{array}$ |  |
| 25 |  | 44 | $\begin{array}{\|r} \mathbf{1} \\ 44 \\ \hline \end{array}$ | $\begin{array}{r} 44 \\ 5 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 13 \\ 53 \\ \hline \end{array}$ |  | 27 | $\begin{aligned} & 44 \\ & 43 \end{aligned}$ | $\begin{aligned} & 26 \\ & 18 \end{aligned}$ | $\begin{aligned} & 44 \\ & 37 \end{aligned}$ |  | 10 | $\begin{aligned} & \hline 39 \\ & 42 \\ & \hline \end{aligned}$ | $\begin{aligned} & 29 \\ & 30 \end{aligned}$ | $\begin{aligned} & \mathbf{3 6} \\ & 34 \\ & \hline \end{aligned}$ |  | 52 | $\begin{aligned} & 4^{6} \\ & 4^{1} \\ & \hline \end{aligned}$ | $\begin{array}{r} 5 \\ 41 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 47 \\ 43 \\ \hline \end{array}$ |  | 34 | $\begin{array}{r} 3 \\ 40 \\ 40 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 29 \\ 52 \\ \hline \end{array}$ | $\begin{aligned} & 5 \\ & 7 \\ & \hline \end{aligned}$ |  |
| 26 |  | 44 | $\begin{array}{\|l\|} \hline 45 \\ 44 \\ \hline \end{array}$ | $\begin{array}{r} 50 \\ 5 \\ \hline \end{array}$ | $\begin{aligned} & 6 \\ & 6 \end{aligned}$ |  | 28 | $\begin{array}{\|l} 27 \\ 43 \\ \hline \end{array}$ | $\begin{aligned} & 45 \\ & 17 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline \mathbf{2 1} \\ 49 \\ \hline \end{array}$ |  | 11 | $\begin{aligned} & 22 \\ & 4^{2} \\ & \hline \end{aligned}$ | $\begin{array}{\|r} \hline \mathbf{0} \\ 29 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 10 \\ 44 \\ \hline \end{array}$ |  | 53 | $\begin{array}{\|l} 27 \\ 41 \\ \hline \end{array}$ | $\begin{aligned} & 47 \\ & 40 \\ & \hline \end{aligned}$ | $\begin{aligned} & 30 \\ & 53 \\ & \hline \end{aligned}$ |  | 34 | $\begin{aligned} & \hline 44 \\ & 40 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 21 \\ 51 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 12 \\ 17 \\ \hline \end{array}$ | 6 |
| 27 |  | 45 | $\begin{array}{\|l\|} \hline 29 \\ 44 \\ \hline \end{array}$ | $\begin{array}{r} 55 \\ 4 \\ \hline \end{array}$ | $\begin{aligned} & 12 \\ & 20 \end{aligned}$ |  | 29 | $\begin{array}{\|l\|} \mathbf{1 1} \\ 43 \end{array}$ | $\begin{array}{r} 3 \\ 17 \\ \hline \end{array}$ | $\begin{array}{r} 10 \\ 1 \\ \hline \end{array}$ |  | 12 | $\begin{array}{r} 4 \\ 4^{2} \\ \hline \end{array}$ | $\begin{aligned} & 29 \\ & 28 \\ & \hline \end{aligned}$ | $\begin{aligned} & 54 \\ & 56 \\ & \hline \end{aligned}$ |  | 54 | $\begin{array}{r} 9 \\ 41 \\ \hline \end{array}$ | $\begin{aligned} & 28 \\ & 40 \end{aligned}$ | $\begin{array}{r} 23 \\ 5 \\ \hline \end{array}$ |  | 35 | $\begin{array}{\|l} 25 \\ 40 \\ \hline \end{array}$ | $\begin{array}{\|l} 12 \\ 50 \\ \hline \end{array}$ | $\begin{aligned} & 29 \\ & 26 \end{aligned}$ | 7 |
| 28 |  | 46 | $\begin{aligned} & \hline 13 \\ & 44 \\ & \hline \end{aligned}$ | $\begin{array}{\|r} 59 \\ 3 \\ \hline \end{array}$ | $\begin{aligned} & 32 \\ & 32 \end{aligned}$ |  | 29 | $\begin{array}{\|l} 54 \\ 43 \\ \hline \end{array}$ | $\begin{aligned} & 20 \\ & 16 \end{aligned}$ | $\begin{aligned} & 11 \\ & 14 \\ & \hline \end{aligned}$ |  | 12 | $\begin{aligned} & 4^{6} \\ & 4^{2} \end{aligned}$ | $\begin{aligned} & 58 \\ & 28 \end{aligned}$ | $\begin{array}{r} 50 \\ 8 \end{array}$ |  | 54 | $\begin{array}{\|l} \hline 51 \\ 4^{1} \\ \hline \end{array}$ | $\begin{array}{r} 8 \\ 39 \\ \hline \end{array}$ | $\begin{aligned} & 28 \\ & 15 \end{aligned}$ |  | $3^{6}$ | $\begin{array}{r} 6 \\ 40 \\ \hline \end{array}$ | $\begin{array}{\|r} \hline \mathbf{2} \\ 49 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 55 \\ 37 \\ \hline \end{array}$ |  |
| 29 |  | 46 | $\begin{array}{\|l\|} \hline 58 \\ 44 \\ \hline \end{array}$ | $\begin{gathered} 3 \\ 2 \end{gathered}$ | $\begin{array}{r} 4 \\ 45 \\ \hline \end{array}$ |  | 30 | $\begin{array}{\|l} 37 \\ 43 \\ \hline \end{array}$ | $\begin{aligned} & 36 \\ & 15 \end{aligned}$ | $\begin{aligned} & 25 \\ & 26 \end{aligned}$ |  | 13 | $\begin{aligned} & 29 \\ & 42 \\ & \hline \end{aligned}$ | $\begin{aligned} & 26 \\ & 27 \end{aligned}$ | $\begin{aligned} & 58 \\ & 19 \end{aligned}$ |  | 55 | $\begin{aligned} & 3^{2} \\ & 4^{1} \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 47 \\ 38 \\ \hline \end{array}$ | $\begin{array}{\|l} 43 \\ 25 \\ \hline \end{array}$ |  | 36 | $\begin{aligned} & 46 \\ & 40 \end{aligned}$ | $\begin{array}{\|l} 52 \\ 48 \\ \hline \end{array}$ | $\begin{array}{\|l} 3^{2} \\ 47 \\ \hline \end{array}$ |  |
| 30 | 42 | 47 | $\begin{array}{\|l\|} \hline \mathbf{4 2} \\ 44 \\ \hline \end{array}$ | $5$ | $\begin{aligned} & 49 \\ & 59 \\ & \hline \end{aligned}$ | 43 | 31 | $\begin{aligned} & 20 \\ & 43 \end{aligned}$ | $\begin{aligned} & \hline 51 \\ & 14 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|l} \mathbf{5 1} \\ \mathbf{3 8} \\ \hline \end{array}$ | 44 | 14 | $\begin{aligned} & 11 \\ & 4^{2} \\ & \hline \end{aligned}$ | $\begin{aligned} & 54 \\ & 26 \end{aligned}$ | $\begin{aligned} & 17 \\ & 31 \\ & \hline \end{aligned}$ | 44 | 56 | $\begin{aligned} & 14 \\ & 41 \\ & \hline \end{aligned}$ | $\begin{aligned} & 26 \\ & 37 \end{aligned}$ | $\begin{array}{r} 8 \\ 37 \\ \hline \end{array}$ | 45 | 37 | $\begin{array}{\|l} \hline 27 \\ 40 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{4 1} \\ & 47 \\ & \hline \end{aligned}$ | $\begin{aligned} & 19 \\ & 57 \end{aligned}$ |  |

Bürgi's 1' sine table (reconstruction, D. Roegel, 2016)

| , | $45^{\circ}$ |  |  |  |  | $46^{\circ}$ |  |  |  |  | $47^{\circ}$ |  |  |  |  | $48^{\circ}$ |  |  |  |  | $49^{\circ}$ |  |  |  |  | , |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 30 | 42 | 47 | $\begin{array}{\|l\|} \hline \mathbf{4 2} \\ 44 \\ \hline \end{array}$ | $\begin{aligned} & 5 \\ & 1 \end{aligned}$ | $\begin{aligned} & 49 \\ & 59 \end{aligned}$ | 43 | 31 | $\begin{array}{\|l} \hline 20 \\ 43 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 51 \\ 14 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline \mathbf{5 1} \\ 38 \\ \hline \end{array}$ | 44 | 14 | $\begin{aligned} & 11 \\ & 42 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 54 \\ 26 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 17 \\ 31 \\ \hline \end{array}$ | 44 | 56 | $\begin{array}{\|l\|} \hline 14 \\ 41 \\ \hline \end{array}$ | $\begin{aligned} & 26 \\ & 37 \\ & \hline \end{aligned}$ | $\begin{array}{\|r} \hline 8 \\ 37 \\ \hline \end{array}$ | 45 | 37 | $\begin{aligned} & 27 \\ & 40 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline \mathbf{4 1} \\ 47 \end{array}$ | $\begin{array}{\|l} \hline \mathbf{1 9} \\ 57 \\ \hline \end{array}$ | 30 |
| 31 |  | 48 | $\begin{array}{\|l\|} \hline 26 \\ 44 \\ \hline \end{array}$ | $7$ | $\begin{aligned} & 48 \\ & 11 \end{aligned}$ |  | 32 | $\begin{array}{r} 4 \\ 43 \end{array}$ | $\begin{array}{r} 6 \\ 13 \\ \hline \end{array}$ | $\begin{aligned} & 29 \\ & 51 \end{aligned}$ |  | 14 | $\begin{aligned} & 54 \\ & 42 \end{aligned}$ | $\begin{aligned} & 20 \\ & 25 \\ & \hline \end{aligned}$ | $\begin{aligned} & 48 \\ & 4^{2} \\ & \hline \end{aligned}$ |  | 56 | $\begin{array}{\|l\|} \hline 56 \\ 41 \end{array}$ | $\begin{array}{r} 3 \\ 36 \\ \hline \end{array}$ | $\begin{aligned} & 45 \\ & 47 \end{aligned}$ |  | $3^{8}$ | $\begin{array}{r} 8 \\ 40 \\ \hline \end{array}$ | $\begin{aligned} & 29 \\ & 47 \end{aligned}$ | $\begin{array}{r} 16 \\ 6 \end{array}$ | 31 |
| 32 |  | 49 | $\begin{array}{\|l\|} \hline 10 \\ 44 \\ \hline \end{array}$ | $8$ | $\begin{aligned} & 59 \\ & 25 \\ & \hline \end{aligned}$ |  | 32 | $\begin{array}{\|l} 47 \\ 43 \\ \hline \end{array}$ | $\begin{aligned} & 20 \\ & 13 \\ & \hline \end{aligned}$ | $\begin{array}{r} 20 \\ 20 \\ \hline \end{array}$ |  | 15 | $\begin{aligned} & 36 \\ & 4^{2} \\ & \hline \end{aligned}$ | $\begin{aligned} & 46 \\ & 24 \\ & \hline \end{aligned}$ | $\begin{aligned} & \mathbf{3 0} \\ & 53 \\ & \hline \end{aligned}$ |  | 57 | $\begin{array}{\|l\|} \hline 37 \\ 41 \\ \hline \end{array}$ | $\begin{aligned} & 40 \\ & 35 \end{aligned}$ | $\begin{aligned} & 32 \\ & 58 \\ & \hline \end{aligned}$ |  | $3^{8}$ | $\begin{aligned} & 49 \\ & 40 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 16 \\ 46 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 22 \\ 17 \\ \hline \end{array}$ | 32 |
| 33 |  | 49 | $\begin{array}{\|l} 54 \\ 43 \\ \hline \end{array}$ | $\begin{array}{r} 9 \\ 59 \\ \hline \end{array}$ | $\begin{aligned} & 24 \\ & 37 \\ & \hline \end{aligned}$ |  | 33 | $\begin{array}{\|l} \hline 30 \\ 43 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 33 \\ 12 \end{array}$ | $\begin{array}{\|l} \mathbf{2 2} \\ 15 \\ \hline \end{array}$ |  | 16 | $\begin{array}{\|l} 19 \\ 4^{2} \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 11 \\ 24 \\ \hline \end{array}$ | $\begin{array}{r} 23 \\ 5 \\ \hline \end{array}$ |  | 58 | $\begin{array}{\|l} 19 \\ 41 \\ \hline \end{array}$ | $\begin{aligned} & 16 \\ & 35 \\ & \hline \end{aligned}$ | $\begin{array}{\|} 30 \\ 9 \\ \hline \end{array}$ |  | 39 | $\begin{aligned} & 30 \\ & 40 \end{aligned}$ | $\begin{array}{r} 2 \\ 45 \\ \hline \end{array}$ | $\begin{aligned} & 39 \\ & 26 \end{aligned}$ | 33 |
| 34 |  | 50 | $\begin{aligned} & 38 \\ & 43 \\ & \hline \end{aligned}$ | $\begin{array}{r} 9 \\ 58 \\ \hline \end{array}$ | $\begin{array}{\|r} 1 \\ 51 \\ \hline \end{array}$ |  | 34 | $\begin{array}{\|l} \mathbf{1 3} \\ \mathbf{4 3} \\ \hline \end{array}$ | $\begin{aligned} & 45 \\ & 11 \end{aligned}$ | $\begin{aligned} & 37 \\ & 28 \end{aligned}$ |  | 17 | $\begin{array}{r} 1 \\ 4^{2} \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 35 \\ 23 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \mathbf{2 8} \\ \mathbf{1} 7 \\ \hline \end{array}$ |  | 59 | $\begin{array}{r} \mathbf{0} \\ 4^{1} \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{5 1} \\ & 34 \\ & \hline \end{aligned}$ | $\begin{aligned} & 39 \\ & 19 \end{aligned}$ |  | 40 | $\begin{aligned} & 10 \\ & 40 \\ & \hline \end{aligned}$ | $\begin{aligned} & 48 \\ & 44 \end{aligned}$ | $\begin{array}{\|r} \hline 5 \\ 37 \\ \hline \end{array}$ | 34 |
| 35 |  | 51 | $\begin{array}{\|l} 22 \\ 43 \end{array}$ | $\begin{array}{r} 7 \\ 58 \\ \hline \end{array}$ | $\begin{array}{r} 5^{2} \\ 4 \end{array}$ |  | 34 | $\begin{array}{\|l\|} \hline 56 \\ 43 \\ \hline \end{array}$ | $\begin{array}{\|l\|} 57 \\ 10 \end{array}$ | $\begin{array}{r} 5 \\ 39 \\ \hline \end{array}$ |  | 17 | $\begin{aligned} & 43 \\ & 42 \end{aligned}$ | $\begin{aligned} & 58 \\ & 22 \end{aligned}$ | $\begin{aligned} & 45 \\ & 28 \end{aligned}$ |  | 59 | $\begin{array}{\|l} 42 \\ 41 \\ \hline \end{array}$ | $\begin{aligned} & 25 \\ & 33 \\ & \hline \end{aligned}$ | $\begin{aligned} & 5^{8} \\ & 30 \end{aligned}$ |  | 40 | $\begin{aligned} & \mathbf{5 1}^{1} \\ & \mathbf{4}^{0} \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \mathbf{3 2}^{2} \\ 43 \\ \hline \end{array}$ | $\begin{aligned} & 4^{2} \\ & 4^{6} \\ & \hline \end{aligned}$ | 35 |
| 36 |  | 52 | $\begin{array}{r} 6 \\ 43 \end{array}$ | $\begin{array}{r} \mathbf{5} \\ 57 \\ \hline \end{array}$ | $\begin{aligned} & 56 \\ & 16 \end{aligned}$ |  | 35 | $\begin{array}{\|l\|} \hline 40 \\ 43 \end{array}$ | $\begin{aligned} & 7 \\ & 9 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 44 \\ 52 \end{array}$ |  | 18 | $\begin{aligned} & 26 \\ & 42 \end{aligned}$ | $\begin{aligned} & 21 \\ & 21 \end{aligned}$ | $\begin{array}{\|l\|} \hline 13 \\ 39 \\ \hline \end{array}$ | 45 | 0 | $\begin{array}{\|l} 23 \\ 41 \end{array}$ | $\begin{aligned} & 59 \\ & 32 \end{aligned}$ | $\begin{aligned} & 28 \\ & 40 \end{aligned}$ |  | 41 | $\begin{aligned} & 3^{2} \\ & 40 \end{aligned}$ | $\begin{aligned} & 16 \\ & 42 \end{aligned}$ | $\begin{aligned} & 28 \\ & 56 \end{aligned}$ | 36 |
| 37 |  | 52 | $\begin{aligned} & \mathbf{5 0} \\ & 43 \end{aligned}$ | $\begin{array}{r} 3 \\ 56 \\ \hline \end{array}$ | $\begin{aligned} & 12 \\ & 30 \\ & \hline \end{aligned}$ |  | 36 | $\begin{array}{\|l} 23 \\ 43 \\ \hline \end{array}$ | $\begin{array}{r} \mathbf{1 7} \\ 9 \\ \hline \end{array}$ | $\begin{array}{r} 3^{6} \\ 4 \\ \hline \end{array}$ |  | 19 | $\begin{array}{r} 8 \\ 42 \end{array}$ | $\begin{aligned} & 42 \\ & 20 \end{aligned}$ | $\begin{array}{\|l} \hline 5^{2} \\ 51 \\ \hline \end{array}$ |  | 1 | $\begin{array}{r} 5 \\ 41 \\ \hline \end{array}$ | $\begin{aligned} & 32 \\ & 31 \\ & \hline 1 \end{aligned}$ | $\begin{array}{r} 8 \\ 51 \\ \hline \end{array}$ |  | 42 | $\begin{aligned} & 12 \\ & 40 \end{aligned}$ | $\begin{aligned} & 59 \\ & 42 \end{aligned}$ | $\begin{array}{r} 24 \\ 6 \end{array}$ | 37 |
| $3^{8}$ |  | 53 | $\begin{array}{\|l} 33 \\ 43 \\ \hline \end{array}$ | $\begin{aligned} & 59 \\ & 55 \\ & \hline \end{aligned}$ | $\begin{aligned} & \mathbf{4 2}^{2} \\ & \mathbf{4}^{2} \\ & \hline \end{aligned}$ |  | 37 | $\begin{array}{\|r\|} \hline 6 \\ 43 \\ \hline \end{array}$ | $\begin{array}{\|r} \hline 26 \\ 8 \\ \hline \end{array}$ | $\begin{aligned} & 40 \\ & 16 \\ & \hline \end{aligned}$ |  | 19 | $\begin{aligned} & 51 \\ & 4^{2} \\ & \hline \end{aligned}$ | $\begin{array}{\|r\|} \hline 3 \\ 20 \\ \hline \end{array}$ | $\begin{array}{r} 43 \\ 2 \end{array}$ |  | 1 | $\begin{array}{\|l} 47 \\ 41 \\ \hline \end{array}$ | $\begin{array}{r} 3 \\ 31 \\ \hline \end{array}$ | $\begin{array}{r} 59 \\ 2 \end{array}$ |  | 42 | $\begin{aligned} & 53 \\ & 40 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 41 \\ 41 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 30 \\ 16 \\ \hline \end{array}$ | $3^{8}$ |
| 39 |  | 54 | $\begin{array}{\|l} \mathbf{1 7} \\ 43 \\ \hline \end{array}$ | $\begin{aligned} & 55 \\ & 54 \end{aligned}$ | $\begin{aligned} & 24 \\ & 56 \\ & \hline \end{aligned}$ |  | 37 | $\begin{aligned} & 49 \\ & 43 \end{aligned}$ | $\begin{array}{r} 34 \\ 7 \end{array}$ | $\begin{aligned} & 56 \\ & 28 \end{aligned}$ |  | 20 | $\begin{array}{\|l} 33 \\ 42 \\ \hline \end{array}$ | $\begin{array}{\|l} 23 \\ 19 \\ \hline \end{array}$ | $\begin{aligned} & 45 \\ & 13 \end{aligned}$ |  | 2 | $\begin{aligned} & 28 \\ & 41 \\ & \hline \end{aligned}$ | $\begin{aligned} & 35 \\ & 30 \\ & \hline \end{aligned}$ | $\begin{array}{\|r} \mathbf{1} \\ \mathbf{1} 3 \\ \hline \end{array}$ |  | 43 | $\begin{aligned} & 34 \\ & 40 \end{aligned}$ | $\begin{array}{\|l} 22 \\ 40 \\ \hline \end{array}$ | $\begin{aligned} & 46 \\ & 26 \end{aligned}$ | 39 |
| 40 | 42 | 55 | $\begin{array}{\|r} \hline \mathbf{1} \\ 43 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 50 \\ 54 \\ \hline \end{array}$ | $\begin{array}{r} 20 \\ \hline 8 \\ \hline \end{array}$ | 43 | $3^{8}$ | $\begin{aligned} & \hline 3^{2} \\ & 43 \\ & \hline \end{aligned}$ | $\begin{array}{r} 42 \\ 6 \\ \hline \end{array}$ | $\begin{aligned} & 24 \\ & 40 \\ & \hline \end{aligned}$ | 44 | 21 | $\begin{aligned} & 15 \\ & 4^{2} \\ & \hline \end{aligned}$ | $\begin{aligned} & 42 \\ & 18 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 58 \\ 25 \\ \hline \end{array}$ | 45 | 3 | $\begin{aligned} & 10 \\ & 41 \\ & \hline \end{aligned}$ | $\begin{array}{r} 5 \\ 29 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 14 \\ 23 \\ \hline \end{array}$ | 45 | 44 | $\begin{aligned} & 15 \\ & 40 \\ & \hline \end{aligned}$ | $\begin{array}{r} 3 \\ 39 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 12 \\ 36 \\ \hline \end{array}$ | 40 |
| 41 |  | 55 | $\begin{array}{\|l\|} \hline 45 \\ 43 \\ \hline \end{array}$ | $\begin{aligned} & \hline 44 \\ & 53 \end{aligned}$ | $\begin{aligned} & 28 \\ & 22 \end{aligned}$ |  | 39 | $\begin{array}{\|l\|} \hline 15 \\ 43 \\ \hline \end{array}$ | $\begin{array}{r} 49 \\ \hline \end{array}$ | $\begin{array}{r} 4 \\ 5^{2} \\ \hline \end{array}$ |  | 21 | $\begin{aligned} & 5^{8} \\ & 4^{2} \\ & \hline \end{aligned}$ | $\begin{array}{\|r} \hline \mathbf{1} \\ \mathbf{1 7} \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 23 \\ 36 \\ \hline \end{array}$ |  | 3 | $\begin{aligned} & \hline 51 \\ & 41 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 34 \\ 28 \end{array}$ | $\begin{aligned} & 37 \\ & 33 \\ & \hline \end{aligned}$ |  | 44 | $\begin{aligned} & 55 \\ & 40 \\ & \hline \end{aligned}$ | $\begin{aligned} & 42 \\ & 38 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 48 \\ 45 \\ \hline \end{array}$ | 41 |
| 42 |  | 56 | $\begin{aligned} & \hline 29 \\ & 43 \\ & \hline \end{aligned}$ | $\begin{aligned} & 37 \\ & 52 \\ & \hline \end{aligned}$ | $\begin{aligned} & 50 \\ & 34 \\ & \hline \end{aligned}$ |  | 39 | $\begin{aligned} & 58 \\ & 43 \\ & \hline \end{aligned}$ | $\begin{array}{r} 54 \\ \hline \end{array}$ | $\begin{array}{r} 56 \\ \hline \end{array}$ |  | 22 | $\begin{aligned} & 40 \\ & 42 \end{aligned}$ | $\begin{aligned} & 18 \\ & 16 \end{aligned}$ | $\begin{array}{\|l} \hline 59 \\ 48 \\ \hline \end{array}$ |  | 4 | $\begin{array}{\|l} \hline 33 \\ 41 \\ \hline \end{array}$ | $\begin{array}{\|r\|} \hline 3 \\ 27 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 10 \\ 44 \\ \hline \end{array}$ |  | 45 | $\begin{aligned} & 3^{6} \\ & 40 \\ & \hline \end{aligned}$ | $\begin{aligned} & 21 \\ & 37 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 33 \\ 55 \\ \hline \end{array}$ | 42 |
| 43 |  | 57 | $\begin{array}{\|l} \mathbf{1 3} \\ 43 \\ \hline \end{array}$ | $\begin{aligned} & 30 \\ & 51 \\ & 51 \end{aligned}$ | $\begin{array}{\|l} 24 \\ 47 \\ \hline \end{array}$ |  | 40 | $\begin{aligned} & 42 \\ & 43 \end{aligned}$ | $\begin{aligned} & \hline \mathbf{0} \\ & 4 \\ & \hline \end{aligned}$ | $\begin{array}{r} 1 \\ 16 \end{array}$ |  | 23 | $\begin{array}{\|l} 22 \\ 4^{2} \\ \hline \end{array}$ | $\begin{aligned} & 35 \\ & 15 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 47 \\ 59 \\ \hline \end{array}$ |  | 5 | $\begin{aligned} & 14 \\ & 41 \end{aligned}$ | $\begin{aligned} & 30 \\ & 26 \end{aligned}$ | $\begin{array}{\|l} 54 \\ 55 \\ \hline \end{array}$ |  | 46 | $\begin{aligned} & 16 \\ & 40 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 59 \\ 37 \\ \hline \end{array}$ | $\begin{array}{r} 28 \\ 6 \end{array}$ | 43 |
| 44 |  | 57 | $\begin{array}{\|l} 57 \\ 43 \\ \hline \end{array}$ | $\begin{aligned} & 22 \\ & 51 \\ & \hline \end{aligned}$ | $\begin{array}{r} 11 \\ 0 \end{array}$ |  | 41 | $\begin{array}{\|l} 25 \\ 43 \\ \hline \end{array}$ | $\begin{aligned} & 4 \\ & 3 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 17 \\ 29 \\ \hline \end{array}$ |  | 24 | $\begin{array}{r} 4 \\ 42 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 51 \\ 15 \\ \hline \end{array}$ | $\begin{aligned} & 46 \\ & 10 \end{aligned}$ |  | 5 | $\begin{array}{\|l} 55 \\ 41 \\ \hline \end{array}$ | $\begin{aligned} & 57 \\ & 26 \end{aligned}$ | $\begin{array}{r} 49 \\ \hline \end{array}$ |  | 46 | $\begin{aligned} & 57 \\ & 40 \\ & \hline \end{aligned}$ | $\begin{aligned} & 36 \\ & 36 \end{aligned}$ | $\begin{array}{\|l\|} \hline 34 \\ 15 \\ \hline \end{array}$ | 44 |
| 45 |  | $5^{8}$ | $\begin{aligned} & \mathbf{4 1} \\ & 43 \end{aligned}$ | $\begin{aligned} & 13 \\ & 50 \\ & \hline \end{aligned}$ | $\begin{aligned} & \hline \mathbf{1 1} \\ & 13 \\ & \hline \end{aligned}$ |  | 42 | $\begin{array}{\|r\|} \hline 8 \\ 43 \\ \hline \end{array}$ | $\begin{aligned} & 7 \\ & 2 \end{aligned}$ | $\begin{aligned} & 46 \\ & 41 \end{aligned}$ |  | 24 | $\begin{array}{\|l} 47 \\ 42 \\ \hline \end{array}$ | $\begin{array}{r} 6 \\ 14 \\ \hline \end{array}$ | $\begin{aligned} & 56 \\ & 21 \end{aligned}$ |  | 6 | $\begin{array}{\|l} 37 \\ 41 \\ \hline \end{array}$ | $\begin{aligned} & 23 \\ & 25 \\ & \hline \end{aligned}$ | $\begin{aligned} & 54 \\ & 16 \end{aligned}$ |  | 47 | $\begin{aligned} & 3^{8} \\ & 40 \end{aligned}$ | $\begin{array}{\|l} \mathbf{1 2} \\ 35 \\ \hline \end{array}$ | $\begin{aligned} & 49 \\ & 24 \\ & \hline \end{aligned}$ | 45 |
| 46 |  | 59 | $\begin{array}{\|l} \mathbf{2 5} \\ 43 \\ \hline \end{array}$ | $\begin{array}{r} 3 \\ 49 \\ \hline \end{array}$ | $\begin{aligned} & 24 \\ & 26 \end{aligned}$ |  | 42 | $\begin{array}{\|l} \mathbf{5 1} \\ \mathbf{4 3} \\ \hline \end{array}$ | $\begin{array}{r} 10 \\ 1 \end{array}$ | $\begin{array}{\|l} \mathbf{2 7} \\ 53 \\ \hline \end{array}$ |  | 25 | $\begin{array}{\|l} 29 \\ 42 \\ \hline \end{array}$ | $\begin{aligned} & 21 \\ & 13 \end{aligned}$ | $\begin{array}{\|l} \mathbf{1 7} \\ 33 \\ \hline \end{array}$ |  | 7 | $\begin{aligned} & 18 \\ & 41 \\ & \hline \end{aligned}$ | $\begin{aligned} & 49 \\ & 24 \\ & \hline \end{aligned}$ | $\begin{aligned} & 10 \\ & 26 \end{aligned}$ |  | 48 | $\begin{aligned} & 18 \\ & 40 \\ & \hline \end{aligned}$ | $\begin{aligned} & 48 \\ & 34 \end{aligned}$ | $\begin{array}{\|l\|} \hline 13 \\ 35 \\ \hline \end{array}$ | 46 |
| 47 | 43 | 0 | $\begin{array}{r} 8 \\ 43 \\ \hline \end{array}$ | $\begin{aligned} & 52 \\ & 48 \end{aligned}$ | $\begin{aligned} & 50 \\ & 39 \end{aligned}$ |  | 43 | $\begin{array}{\|l\|} \hline 34 \\ 43 \\ \hline \end{array}$ | $\begin{array}{r} 12 \\ 1 \end{array}$ | $\begin{array}{r} 20 \\ 5 \end{array}$ |  | 26 | $\begin{array}{\|l\|l} 11 \\ 4^{2} \\ \hline \end{array}$ | $\begin{aligned} & 34 \\ & 12 \end{aligned}$ | $\begin{aligned} & 50 \\ & 44 \end{aligned}$ |  | 8 | $\begin{array}{r} 0 \\ 41 \end{array}$ | $\begin{aligned} & 13 \\ & 23 \end{aligned}$ | $\begin{aligned} & 36 \\ & 37 \end{aligned}$ |  | 48 | $\begin{aligned} & 59 \\ & 40 \end{aligned}$ | $\begin{aligned} & 22 \\ & 33 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 48 \\ 44 \\ \hline \end{array}$ | 47 |
| 48 |  | 0 | $\begin{array}{\|l} \hline \mathbf{5}^{2} \\ 43 \\ \hline \end{array}$ | $\begin{aligned} & \hline \mathbf{4 1} \\ & 47 \\ & \hline \end{aligned}$ | $\begin{aligned} & 29 \\ & 51 \\ & \hline \end{aligned}$ |  | 44 | $\begin{array}{\|l} \hline \mathbf{1 7} \\ \mathbf{4 3} \\ \hline \end{array}$ | $\begin{array}{r} 13 \\ 0 \end{array}$ | $\begin{array}{\|l} \hline 25 \\ 17 \\ \hline \end{array}$ |  | 26 | $\begin{aligned} & 53 \\ & 4^{2} \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 47 \\ 11 \end{array}$ | $\begin{array}{\|l\|} \hline 34 \\ 55 \\ \hline \end{array}$ |  | 8 | $\begin{aligned} & \hline \mathbf{4 1} \\ & 41 \\ & \hline \end{aligned}$ | $\begin{array}{l\|} \hline 37 \\ 22 \end{array}$ | $\begin{array}{\|l} \mathbf{1 3} \\ 47 \\ \hline \end{array}$ |  | 49 | $\begin{aligned} & 39 \\ & 40 \\ & \hline \end{aligned}$ | $\begin{aligned} & 5^{6} \\ & 3^{2} \\ & \hline \end{aligned}$ | $\begin{aligned} & 32 \\ & 54 \\ & \hline \end{aligned}$ | 48 |
| 49 |  | 1 | $\begin{aligned} & 36 \\ & 43 \\ & \hline \end{aligned}$ | $\begin{aligned} & 29 \\ & 47 \\ & \hline \end{aligned}$ | $\begin{array}{r} 20 \\ \hline \end{array}$ |  | 45 | $\begin{array}{\|r\|} \hline 0 \\ 4^{2} \\ \hline \end{array}$ | $\begin{array}{\|l} 13 \\ 59 \\ \hline \end{array}$ | $\begin{aligned} & 42 \\ & 29 \end{aligned}$ |  | 27 | $\begin{aligned} & 35 \\ & 42 \end{aligned}$ | $\begin{array}{\|l} 59 \\ 11 \end{array}$ | $\begin{array}{r} 29 \\ 7 \\ \hline \end{array}$ |  | 9 | $\begin{array}{\|l} 23 \\ 41 \\ \hline \end{array}$ | $\begin{array}{\|r} \hline 0 \\ 21 \end{array}$ | $\begin{array}{r} \mathbf{0} \\ 58 \\ \hline \end{array}$ |  | 50 | $\begin{aligned} & 20 \\ & 40 \end{aligned}$ | $\begin{aligned} & 29 \\ & 3^{2} \end{aligned}$ | $\begin{array}{r} 26 \\ \hline 4 \end{array}$ | 49 |
| 50 | 43 | 2 | $\begin{array}{\|l} \mathbf{2 0} \\ 43 \\ \hline \end{array}$ | $\begin{aligned} & \hline 16 \\ & 46 \end{aligned}$ | $\begin{array}{\|l} \mathbf{2 4} \\ 17 \\ \hline \end{array}$ | 43 | 45 | $\begin{aligned} & 43 \\ & 42 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|l\|} \hline 13 \\ 58 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 11 \\ 41 \\ \hline \end{array}$ | 44 | 28 | $\begin{aligned} & \hline 18 \\ & 42 \\ & \hline \end{aligned}$ | $\begin{aligned} & 10 \\ & 10 \\ & \hline \end{aligned}$ | $\begin{aligned} & 36 \\ & 18 \\ & \hline \end{aligned}$ | 45 | 10 | $\begin{array}{r} 4 \\ 41 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 21 \\ 21 \\ \hline \end{array}$ | $\begin{array}{r} 58 \\ 8 \end{array}$ | 45 | $5^{1}$ | $\begin{array}{r} 1 \\ 4^{0} \\ \hline \end{array}$ | $\begin{array}{\|r} 1 \\ 31 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 30 \\ 13 \\ \hline \end{array}$ | 50 |
| 51 |  | 3 | $\begin{array}{r} 4 \\ 43 \\ \hline \end{array}$ | $\begin{array}{r} 2 \\ 45 \\ \hline \end{array}$ | $\begin{aligned} & 41 \\ & 30 \end{aligned}$ |  | 46 | $\begin{array}{\|l\|} \hline 26 \\ 42 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \mathbf{1 1} \\ 57 \\ \hline \end{array}$ | $\begin{aligned} & 52 \\ & 52 \\ & \hline \end{aligned}$ |  | 29 | $\begin{array}{r} 0 \\ 42 \\ \hline \end{array}$ | $\begin{array}{r} 20 \\ 9 \\ \hline \end{array}$ | $\begin{aligned} & 54 \\ & 28 \end{aligned}$ |  | 10 | $\begin{array}{\|l} 45 \\ 41 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 43 \\ 20 \end{array}$ | $\begin{array}{r} 6 \\ 19 \\ \hline \end{array}$ |  | 51 | $\begin{aligned} & 41 \\ & 40 \\ & \hline \end{aligned}$ | $\begin{aligned} & 3^{2} \\ & 30 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 43 \\ 23 \\ \hline \end{array}$ | 51 |
| 52 |  | 3 | $\begin{aligned} & 47 \\ & 43 \\ & \hline \end{aligned}$ | $\begin{aligned} & \hline 48 \\ & 44 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline \mathbf{1 1} \\ 43 \\ \hline \end{array}$ |  | 47 | $\begin{array}{\|r\|} \hline 9 \\ 4^{2} \\ \hline \end{array}$ | $\begin{array}{r} 9 \\ 57 \end{array}$ | $\begin{array}{r} 44 \\ 5 \end{array}$ |  | 29 | $\begin{array}{\|l} 4^{2} \\ 42 \\ \hline \end{array}$ | $\begin{gathered} 30 \\ 8 \end{gathered}$ | $\begin{aligned} & 22 \\ & 41 \end{aligned}$ |  | 11 | $\begin{aligned} & 27 \\ & 41 \end{aligned}$ | $\begin{array}{r} \hline 3 \\ 19 \\ \hline \end{array}$ | $\begin{aligned} & 25 \\ & 29 \end{aligned}$ |  | 52 | $\begin{aligned} & 22 \\ & 40 \end{aligned}$ | $\begin{array}{r} 3 \\ 29 \\ \hline \end{array}$ | $\begin{array}{r} \mathbf{6} \\ 33 \end{array}$ | 52 |
| 53 |  | 4 | $\begin{array}{\|l} \hline \mathbf{3 1} \\ 43 \\ \hline \end{array}$ | $\begin{aligned} & 32 \\ & 43 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \mathbf{5 4} \\ 55 \\ \hline \end{array}$ |  | 47 | $\begin{array}{\|l} 52 \\ 42 \\ \hline \end{array}$ | $\begin{array}{r} 6 \\ 56 \\ \hline \end{array}$ | $\begin{aligned} & 49 \\ & 17 \\ & \hline \end{aligned}$ |  | 30 | $\begin{array}{\|l} 24 \\ 42 \\ \hline \end{array}$ | $\begin{array}{\|r\|} \hline 39 \\ 7 \\ \hline \end{array}$ | $\begin{array}{\|r} 3 \\ 51 \\ \hline \end{array}$ |  | 12 | $\begin{array}{\|r} \hline 8 \\ 4^{1} \\ \hline \end{array}$ | $\begin{aligned} & 22 \\ & 18 \end{aligned}$ | $\begin{aligned} & 54 \\ & 40 \\ & \hline \end{aligned}$ |  | 53 | $\begin{array}{r} 2 \\ 40 \\ \hline \end{array}$ | $\begin{aligned} & 32 \\ & 28 \end{aligned}$ | $\begin{array}{\|l} \hline 39 \\ 42 \\ \hline \end{array}$ | 53 |
| 54 |  | 5 | $\begin{array}{\|l\|} \hline 15 \\ 43 \\ \hline \end{array}$ | $\begin{aligned} & \hline \mathbf{1 6} \\ & 43 \\ & \hline \end{aligned}$ | $\begin{array}{r} 49 \\ 8 \end{array}$ |  | 48 | $\begin{array}{\|l\|} \hline 35 \\ 42 \\ \hline \end{array}$ | $\begin{array}{r} 3 \\ 55 \\ \hline \end{array}$ | $\begin{array}{r} 6 \\ 29 \\ \hline \end{array}$ |  | 31 | $\begin{array}{r} 6 \\ 42 \\ \hline \end{array}$ | $\begin{array}{r} 46 \\ \hline 7 \\ \hline \end{array}$ | $54$ |  | 12 | $\begin{array}{\|l\|} \hline 49 \\ 41 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{4 1} \\ & 17 \\ & \hline \end{aligned}$ | $\begin{aligned} & 34 \\ & 50 \\ & \hline \end{aligned}$ |  | 53 | $\begin{aligned} & 43 \\ & 40 \end{aligned}$ | 1 27 | $\begin{array}{\|l\|} \hline \mathbf{2 1} \\ 53 \\ \hline \end{array}$ | 54 |
| 55 |  | 5 | $\begin{aligned} & 58 \\ & 43 \end{aligned}$ | $\begin{aligned} & \hline 59 \\ & 42 \\ & \hline \end{aligned}$ | $\begin{aligned} & 57 \\ & 21 \end{aligned}$ |  | 49 | $\begin{array}{\|l} 17 \\ 4^{2} \\ \hline \end{array}$ | $\begin{aligned} & 58 \\ & 54 \\ & \hline \end{aligned}$ | $\begin{aligned} & 35 \\ & 41 \\ & \hline \end{aligned}$ |  | 31 | $\begin{aligned} & 48 \\ & 42 \end{aligned}$ | $\begin{array}{r} 53 \\ 6 \end{array}$ | $\begin{aligned} & 56 \\ & 14 \end{aligned}$ |  | 13 | $\begin{aligned} & 30 \\ & 41 \\ & \hline \end{aligned}$ | $\begin{aligned} & 59 \\ & 17 \end{aligned}$ | $\begin{gathered} 24 \\ 0 \end{gathered}$ |  | 54 | $\begin{aligned} & 23 \\ & 40 \\ & \hline \end{aligned}$ | $\begin{aligned} & 29 \\ & 27 \\ & \hline \end{aligned}$ | 14 1 | 55 |
| 56 |  | 6 | $\begin{array}{\|l} \hline \mathbf{4 2} \\ 43 \\ \hline \end{array}$ | $\begin{aligned} & \hline 42 \\ & 41 \\ & \hline \end{aligned}$ | $\begin{aligned} & \hline \mathbf{1 8} \\ & 34 \\ & \hline \end{aligned}$ |  | 50 | $\begin{array}{\|r\|} \hline 0 \\ 4^{2} \\ \hline \end{array}$ | $\begin{aligned} & 53 \\ & 53 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 16 \\ 53 \\ \hline \end{array}$ |  | 32 | $\begin{array}{\|l} \hline 3^{1} \\ 42 \\ \hline \end{array}$ | $\begin{aligned} & \hline \mathbf{0} \\ & 5 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 10 \\ 25 \\ \hline \end{array}$ |  | 14 | $\begin{array}{\|l} 12 \\ 41 \\ \hline \end{array}$ | $\begin{aligned} & 16 \\ & 16 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} 24 \\ 11 \end{array}$ |  | 55 | $\begin{array}{r} 3 \\ 40 \\ \hline \end{array}$ | $\begin{aligned} & 56 \\ & 26 \end{aligned}$ | $\begin{array}{\|l\|} \hline 15 \\ 12 \\ \hline \end{array}$ | 56 |
| 57 |  | 7 | $\begin{aligned} & 26 \\ & 43 \\ & \hline \end{aligned}$ | $\begin{aligned} & 23 \\ & 40 \\ & \hline \end{aligned}$ | $\begin{aligned} & 5^{2} \\ & 46 \\ & \hline \end{aligned}$ |  | 50 | $\begin{aligned} & 43 \\ & 4^{2} \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 47 \\ 53 \\ \hline \end{array}$ | $\begin{aligned} & \hline 9 \\ & 4 \\ & \hline \end{aligned}$ |  | 33 | $\begin{aligned} & 13 \\ & 42 \\ & \hline \end{aligned}$ | $\begin{aligned} & 5 \\ & 4 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 35 \\ 36 \\ \hline \end{array}$ |  | 14 | $\begin{aligned} & 53 \\ & 41 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 32 \\ 15 \\ \hline \end{array}$ | $\begin{aligned} & 35 \\ & 21 \end{aligned}$ |  | 55 | $\begin{aligned} & 44 \\ & 40 \end{aligned}$ | $\begin{aligned} & 22 \\ & 25 \\ & \hline \end{aligned}$ | $\begin{aligned} & 27 \\ & 21 \end{aligned}$ | 57 |
| 58 |  | 8 | $\begin{array}{\|l} \mathbf{1 0} \\ 43 \\ \hline \end{array}$ | $\begin{array}{r} 4 \\ 39 \\ \hline \end{array}$ | $\begin{aligned} & 38 \\ & 59 \\ & \hline \end{aligned}$ |  | $5^{1}$ | $\begin{array}{\|l\|} \hline 26 \\ 42 \\ \hline \end{array}$ | $\begin{aligned} & 40 \\ & 52 \end{aligned}$ | $\begin{aligned} & 13 \\ & 17 \\ & \hline \end{aligned}$ |  | 33 | $\begin{array}{\|l} 55 \\ 42 \\ \hline \end{array}$ | $\begin{array}{\|r} 10 \\ 3 \end{array}$ | $\begin{array}{\|l\|} \mathbf{1 1} \\ 47 \\ \hline \end{array}$ |  | 15 | $\begin{array}{\|l\|} \hline 34 \\ 41 \\ \hline \end{array}$ | $\begin{aligned} & 47 \\ & 14 \\ & \hline \end{aligned}$ | $\begin{aligned} & 56 \\ & 3^{2} \end{aligned}$ |  | 56 | $\begin{aligned} & 24 \\ & 40 \\ & \hline \end{aligned}$ | $\begin{aligned} & 47 \\ & 24 \\ & \hline \end{aligned}$ | $\begin{aligned} & \hline 48 \\ & 3^{1} \end{aligned}$ | 58 |
| 59 |  | 8 | $\begin{array}{\|l} 53 \\ 43 \end{array}$ | $\begin{aligned} & 44 \\ & 39 \\ & \hline \end{aligned}$ | $\begin{aligned} & 37 \\ & 12 \end{aligned}$ |  | 52 | $\begin{array}{\|r\|} \hline 9 \\ 42 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{3 2}^{2} \\ & 51 \end{aligned}$ | $\begin{aligned} & 30 \\ & 28 \end{aligned}$ |  | 34 | $\begin{array}{\|l} 37 \\ 42 \\ \hline \end{array}$ | $\begin{array}{r} 13 \\ 2 \end{array}$ | $\begin{aligned} & 58 \\ & 58 \end{aligned}$ |  | 16 | $\begin{aligned} & 16 \\ & 41 \end{aligned}$ | $\begin{array}{r} 2 \\ \mathbf{2} \end{array}$ | $\begin{aligned} & 28 \\ & 42 \end{aligned}$ |  | 57 | $\begin{array}{r} 5 \\ 40 \\ \hline \end{array}$ | $\begin{array}{\|l} 12 \\ 23 \\ \hline \end{array}$ | $\begin{aligned} & 19 \\ & 40 \end{aligned}$ | 59 |
| 60 | 43 | 9 | $\begin{array}{\|l\|} 37 \\ 43 \\ \hline \end{array}$ | $\begin{array}{r} 23 \\ 38 \\ \hline \end{array}$ | $\begin{array}{\|l} 49 \\ 24 \\ \hline \end{array}$ | 43 | 52 | $\begin{array}{\|l\|} 5^{2} \\ 42 \\ \hline \end{array}$ | $\begin{aligned} & 23 \\ & 50 \\ & \hline \end{aligned}$ | $\begin{aligned} & 58 \\ & 41 \end{aligned}$ | 44 | 35 | $\begin{array}{\|l} 19 \\ 4^{2} \\ \hline \end{array}$ | $\begin{array}{r} 16 \\ 2 \end{array}$ | $\begin{aligned} & 56 \\ & 10 \end{aligned}$ | 45 | 16 | $\begin{array}{\|l} 57 \\ 41 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 16 \\ 12 \end{array}$ | $\begin{array}{\|l} 10 \\ 5^{2} \\ \hline \end{array}$ | 45 | 57 | $\begin{array}{\|l} 45 \\ 40 \\ \hline \end{array}$ | $\begin{aligned} & 35 \\ & 22 \end{aligned}$ | $\begin{aligned} & 59 \\ & 50 \\ & \hline \end{aligned}$ | 60 |

Bürgi's 1' sine table (reconstruction, D. Roegel, 2016)

| 1 | $50^{\circ}$ |  |  |  |  | $51^{\circ}$ |  |  |  |  | $52^{\circ}$ |  |  |  |  | $53^{\circ}$ |  |  |  |  | $54^{\circ}$ |  |  |  |  | $\begin{gathered} \prime \\ \hline 0 \end{gathered}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 0 | 45 | 57 | $\begin{aligned} & \hline 45 \\ & 40 \\ & \hline \end{aligned}$ | $\begin{array}{l\|} \hline 35 \\ 22 \end{array}$ | $\begin{aligned} & 59 \\ & 50 \\ & \hline \end{aligned}$ | 46 | 37 | $\begin{aligned} & \hline 43 \\ & 39 \end{aligned}$ | $\begin{aligned} & \hline \mathbf{3 1}^{1} \\ & 3^{2} \end{aligned}$ | $\begin{array}{r} 40 \\ 3 \\ \hline \end{array}$ | 47 | 16 | $\begin{aligned} & \hline 50 \\ & 38 \\ & \hline \end{aligned}$ | $\begin{aligned} & 19 \\ & 40 \end{aligned}$ | $\begin{aligned} & \mathbf{2 2} \\ & 33 \end{aligned}$ | 47 | 55 | $\begin{array}{r} \mathbf{5} \\ 37 \end{array}$ | $\begin{array}{\|l} \hline 16 \\ 48 \\ \hline \end{array}$ | $\begin{aligned} & 13 \\ & 21 \end{aligned}$ | 48 | 32 | $\begin{aligned} & 27 \\ & 36 \end{aligned}$ | $\begin{aligned} & \mathbf{4 0} \\ & 55 \end{aligned}$ | $\begin{aligned} & 15 \\ & \mathbf{2 7} \end{aligned}$ |  |
| 1 |  | 58 | $\begin{aligned} & 25 \\ & 40 \\ & \hline \end{aligned}$ | $\begin{aligned} & 58 \\ & 21 \end{aligned}$ | $\begin{aligned} & 49 \\ & 59 \\ & \hline \end{aligned}$ |  | 38 | $\begin{aligned} & 23 \\ & 39 \end{aligned}$ | $\begin{array}{\|r} \hline 3 \\ 31 \\ \hline \end{array}$ | $\begin{aligned} & 43 \\ & 12 \end{aligned}$ |  | 17 | $\begin{aligned} & 28 \\ & 38 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 59 \\ 39 \\ \hline \end{array}$ | $\begin{aligned} & 55 \\ & 4^{2} \end{aligned}$ |  | 55 | $\begin{aligned} & 43 \\ & 37 \\ & \hline \end{aligned}$ | $\begin{array}{r} 4 \\ 47 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 34 \\ 28 \\ \hline \end{array}$ |  | 33 | $\begin{array}{r} 4 \\ 3^{6} \\ \hline \end{array}$ | $\begin{aligned} & 35 \\ & 54 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline \mathbf{4 2}^{2} \\ \hline \end{array}$ | 1 |
| 2 |  | 59 | $\begin{array}{r} 6 \\ 40 \\ \hline \end{array}$ | $\begin{aligned} & 20 \\ & 21 \end{aligned}$ | $\begin{array}{r} 48 \\ 9 \end{array}$ |  | 39 | $\begin{array}{r} 2 \\ 39 \end{array}$ | $\begin{aligned} & 34 \\ & 30 \\ & \hline \end{aligned}$ | $\begin{aligned} & 55 \\ & 21 \end{aligned}$ |  | 18 | $\begin{array}{r} 7 \\ 38 \\ \hline \end{array}$ | $\begin{aligned} & 39 \\ & 38 \end{aligned}$ | $\begin{array}{\|l} 37 \\ 50 \end{array}$ |  | 56 | $\begin{aligned} & 20 \\ & 37 \end{aligned}$ | $\begin{array}{\|l} \hline 52 \\ 46 \\ \hline \end{array}$ | $\begin{array}{\|r} \hline 2 \\ 3^{6} \\ \hline \end{array}$ |  | 33 | $\begin{aligned} & \hline \mathbf{4 1} \\ & 36 \end{aligned}$ | $\begin{aligned} & \mathbf{3 0} \\ & 53 \end{aligned}$ | $\begin{array}{\|l} \hline 16 \\ 41 \\ \hline \end{array}$ | 2 |
| 3 |  | 59 | $\begin{array}{\|l} \hline 4^{6} \\ 40 \\ \hline \end{array}$ | $\begin{aligned} & 41 \\ & 20 \end{aligned}$ | $\begin{aligned} & \hline 57 \\ & 19 \\ & \hline \end{aligned}$ |  | 39 | $\begin{aligned} & 42 \\ & 39 \\ & \hline \end{aligned}$ | $\begin{array}{r} 5 \\ 29 \\ \hline \end{array}$ | $\begin{aligned} & 16 \\ & 30 \\ & \hline \end{aligned}$ |  | 18 | $\begin{aligned} & 46 \\ & 38 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline \mathbf{1 8} \\ 37 \\ \hline \end{array}$ | $\begin{array}{\|l} \mathbf{2 7} \\ 57 \\ \hline \end{array}$ |  | 56 | $\begin{aligned} & 58 \\ & 37 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 38 \\ 45 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 38 \\ 44 \\ \hline \end{array}$ |  | 34 | $\begin{array}{\|l} \hline 18 \\ 36 \\ \hline \end{array}$ | $\begin{array}{\|l} 23 \\ 5^{2} \\ \hline \end{array}$ | $\begin{array}{\|l} 57 \\ 47 \\ \hline \end{array}$ | 3 |
| 4 | 46 | 0 | $\begin{aligned} & 27 \\ & 40 \\ & \hline \end{aligned}$ | $\begin{array}{\|r} 2 \\ 19 \\ \hline \end{array}$ | $\begin{aligned} & 16 \\ & 28 \end{aligned}$ |  | 40 | $\begin{array}{\|l\|} \mathbf{2 1} \\ 39 \\ \hline \end{array}$ | $\begin{array}{\|l} 34 \\ 28 \\ \hline \end{array}$ | $\begin{aligned} & 46 \\ & 39 \\ & \hline \end{aligned}$ |  | 19 | $\begin{array}{\|l} 24 \\ 38 \\ \hline \end{array}$ | $\begin{aligned} & 56 \\ & 37 \\ & \hline \end{aligned}$ | $\begin{array}{r} 24 \\ 6 \end{array}$ |  | 57 | $\begin{aligned} & 3^{6} \\ & 37 \\ & \hline \end{aligned}$ | $\begin{array}{r} \mathbf{2 4} \\ 44 \\ \hline \end{array}$ | $\begin{aligned} & 22 \\ & 50 \\ & \hline \end{aligned}$ |  | 34 | $\begin{array}{\|l} 55 \\ 36 \\ \hline \end{array}$ | $\begin{aligned} & 16 \\ & 51 \end{aligned}$ | $\begin{array}{\|l} 44 \\ 55 \\ \hline \end{array}$ | 4 |
| 5 |  | 1 | $\begin{array}{r} 7 \\ 40 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 21 \\ 18 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 44 \\ 38 \\ \hline \end{array}$ |  | 41 | $\begin{array}{r} \mathbf{1} \\ 39 \\ \hline \end{array}$ | $\begin{array}{\|r} 3 \\ 27 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 25 \\ 47 \\ \hline \end{array}$ |  | 20 | $\begin{array}{\|r} 3 \\ 3^{8} \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 33 \\ 36 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 30 \\ 14 \\ \hline \end{array}$ |  | 58 | $\begin{array}{\|l\|} \hline 14 \\ 37 \\ \hline \end{array}$ | $\begin{array}{\|r} 9 \\ 43 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 12 \\ 58 \\ \hline \end{array}$ |  | 35 | $\begin{array}{\|l} \hline 32 \\ 36 \\ \hline \end{array}$ | $\begin{array}{\|r} 8 \\ 51 \\ \hline \end{array}$ | $\begin{array}{\|r} \hline 39 \\ 1 \\ \hline \end{array}$ | 5 |
| 6 |  | 1 | $\begin{aligned} & 47 \\ & 40 \end{aligned}$ | $\begin{aligned} & 40 \\ & 17 \end{aligned}$ | $\begin{aligned} & 22 \\ & 47 \\ & \hline \end{aligned}$ |  | 41 | $\begin{aligned} & 40 \\ & 39 \\ & \hline \end{aligned}$ | $\left\lvert\, \begin{aligned} & \mathbf{3 1} \\ & \mathbf{2 6} \end{aligned}\right.$ | $\begin{aligned} & 12 \\ & 57 \\ & \hline \end{aligned}$ |  | 20 | $\begin{aligned} & 42 \\ & 38 \\ & \hline \end{aligned}$ | $\begin{array}{r} 9 \\ 35 \\ \hline \end{array}$ | $\begin{array}{\|l} 44 \\ 22 \end{array}$ |  | 58 | $\begin{array}{\|l} \mathbf{5 1} \\ 37 \\ \hline \end{array}$ | $\begin{aligned} & 53 \\ & 43 \end{aligned}$ | $\begin{array}{r} 10 \\ 6 \end{array}$ |  | $3^{6}$ | $\begin{array}{r} 8 \\ 36 \end{array}$ | $\begin{aligned} & 59 \\ & 50 \end{aligned}$ | $40$ | 6 |
| 7 |  | 2 | $\begin{aligned} & 27 \\ & 40 \end{aligned}$ | $\begin{aligned} & 58 \\ & 16 \end{aligned}$ | $\begin{array}{r} 9 \\ 57 \end{array}$ |  | 42 | $\begin{aligned} & \mathbf{1 9} \\ & \mathbf{3 9} \end{aligned}$ | $\begin{aligned} & 58 \\ & 26 \end{aligned}$ | $\begin{aligned} & 9 \\ & 5 \\ & \hline \end{aligned}$ |  | 21 | $\begin{aligned} & 20 \\ & 38 \end{aligned}$ | $\begin{array}{\|l} 45 \\ 34 \end{array}$ | $\begin{array}{r} 6 \\ 31 \end{array}$ |  | 59 | $\begin{array}{\|l} 29 \\ 37 \\ \hline \end{array}$ | $\begin{aligned} & 36 \\ & 42 \end{aligned}$ | $\begin{aligned} & \hline 16 \\ & 13 \end{aligned}$ |  | $3^{6}$ | $\begin{aligned} & 45 \\ & 36 \\ & \hline \end{aligned}$ | $\begin{array}{\|} 49 \\ 49 \\ \hline \end{array}$ | $\begin{array}{\|l} 47 \\ 15 \\ \hline \end{array}$ | 7 |
| 8 |  | 3 | $\begin{array}{r} 8 \\ 40 \\ \hline \end{array}$ | $\begin{aligned} & 15 \\ & 16 \end{aligned}$ | $\begin{aligned} & 6 \\ & 6 \end{aligned}$ |  | 42 | $\begin{aligned} & 59 \\ & 39 \end{aligned}$ | $\begin{aligned} & 24 \\ & 25 \\ & \hline \end{aligned}$ | $14$ |  | 21 | $\begin{aligned} & 59 \\ & 38 \\ & \hline \end{aligned}$ | $\begin{aligned} & 19 \\ & 33 \end{aligned}$ | $\begin{array}{\|l} 37 \\ 38 \end{array}$ | 48 | 0 | $\begin{array}{r} 7 \\ 37 \end{array}$ | $\begin{array}{\|l\|} \hline 18 \\ 41 \\ \hline \end{array}$ | $\begin{aligned} & 29 \\ & 20 \end{aligned}$ |  | 37 | $\begin{aligned} & 22 \\ & 36 \end{aligned}$ | $\begin{aligned} & 39 \\ & 48 \\ & \hline \end{aligned}$ | $\begin{array}{r} 2 \\ 21 \\ 21 \end{array}$ | 8 |
| 9 |  | 3 | $\begin{array}{\|l} \hline 48 \\ 40 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline \mathbf{3 1} \\ 15 \\ \hline \end{array}$ | $\begin{aligned} & \hline 12 \\ & 16 \\ & \hline \end{aligned}$ |  | 43 | $\begin{aligned} & \hline 38 \\ & 39 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 49 \\ 24 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 28 \\ 22 \end{array}$ |  | 22 | $\begin{array}{\|l} 37 \\ 38 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 53 \\ 32 \\ \hline \end{array}$ | $\begin{aligned} & 15 \\ & 46 \end{aligned}$ |  | 0 | $\begin{aligned} & 44 \\ & 37 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 59 \\ 40 \\ \hline \end{array}$ | $\begin{array}{\|l} 49 \\ 28 \\ \hline \end{array}$ |  | 37 | $\begin{array}{\|l} \hline 59 \\ 36 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 27 \\ 47 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 23 \\ 27 \\ \hline \end{array}$ | 9 |
| 10 | 46 | 4 | $\begin{aligned} & 28 \\ & 40 \end{aligned}$ | $\begin{aligned} & 46 \\ & 14 \end{aligned}$ | $\begin{aligned} & \hline 28 \\ & 25 \\ & \hline \end{aligned}$ | 46 | 44 | $\begin{aligned} & \mathbf{1 8} \\ & 39 \end{aligned}$ | $\begin{array}{\|l\|} \hline 13 \\ 23 \\ \hline \end{array}$ | $\begin{aligned} & 50 \\ & 31 \end{aligned}$ | 47 | 23 | $\begin{array}{\|l} \hline 16 \\ 3^{8} \\ \hline \end{array}$ | $\begin{aligned} & 26 \\ & 31 \\ & \hline \end{aligned}$ | $\begin{array}{\|r} \mathbf{1} \\ 54 \\ \hline \end{array}$ | 48 | 1 | $\begin{aligned} & 22 \\ & 37 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 40 \\ 39 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline \mathbf{1 7} \\ 35 \\ \hline \end{array}$ | 48 | 38 | $\begin{aligned} & 36 \\ & 36 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 14 \\ 46 \end{array}$ | $\begin{aligned} & 50 \\ & 35 \end{aligned}$ |  |
| 11 |  | 5 | $\begin{array}{\|r} 9 \\ 40 \\ \hline \end{array}$ | $\begin{array}{r} \hline \mathbf{0} \\ 13 \\ \hline \end{array}$ | $\begin{aligned} & \hline 53 \\ & 35 \\ & \hline \end{aligned}$ |  | 44 | $\begin{aligned} & 57 \\ & 39 \end{aligned}$ | $\begin{aligned} & 37 \\ & 22 \end{aligned}$ | $\begin{array}{\|l\|} \hline 21 \\ 41 \\ \hline \end{array}$ |  | 23 | $\begin{array}{\|l\|} \hline 54 \\ 38 \\ \hline \end{array}$ | $\begin{aligned} & 57 \\ & 31 \\ & \hline \end{aligned}$ | $\begin{array}{r} 55 \\ \hline \end{array}$ |  | 2 | $\begin{array}{r} \mathbf{o} \\ 37 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 19 \\ 38 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 5^{2} \\ 42 \\ \hline \end{array}$ |  | 39 | $\begin{array}{\|l} \hline 13 \\ 36 \\ \hline \end{array}$ | $\begin{array}{\|r} \hline \mathbf{1} \\ 45 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 25 \\ 41 \\ \hline \end{array}$ |  |
| 12 |  | 5 | $\begin{array}{\|l} \hline 49 \\ 40 \\ \hline \end{array}$ | $\begin{aligned} & \hline 14 \\ & 12 \end{aligned}$ | $\begin{aligned} & \hline 28 \\ & 44 \\ & \hline \end{aligned}$ |  | 45 | $\begin{aligned} & 37 \\ & 39 \end{aligned}$ | $\begin{array}{\|r} \hline 0 \\ 21 \end{array}$ | $\begin{array}{r} 2 \\ 48 \\ \hline \end{array}$ |  | 24 | $\begin{array}{\|l} 33 \\ 38 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline \mathbf{2 8} \\ 30 \\ \hline \end{array}$ | $\begin{aligned} & 58 \\ & 10 \end{aligned}$ |  | 2 | $\begin{array}{\|l} 37 \\ 37 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 58 \\ 37 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 34 \\ 50 \\ \hline \end{array}$ |  | 39 | $\begin{array}{\|l} \hline 49 \\ 36 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 47 \\ 44 \\ \hline \end{array}$ | $\begin{array}{\|r\|} \hline 6 \\ 47 \\ \hline \end{array}$ |  |
| 13 |  | 6 | $\begin{aligned} & 29 \\ & 40 \\ & \hline \end{aligned}$ | $\begin{aligned} & 27 \\ & 11 \end{aligned}$ | $\begin{aligned} & \hline 12 \\ & 54 \\ & \hline \end{aligned}$ |  | 46 | $\begin{aligned} & 16 \\ & 39 \end{aligned}$ | $\begin{aligned} & 21 \\ & 20 \end{aligned}$ | $\begin{aligned} & 50 \\ & 58 \\ & \hline \end{aligned}$ |  | 25 | $\begin{array}{\|l\|l} \mathbf{1 1} \\ 38 \\ \hline \end{array}$ | $\begin{aligned} & 59 \\ & 29 \\ & \hline \end{aligned}$ | $\begin{array}{r} 8 \\ 18 \\ \hline \end{array}$ |  | 3 | $\begin{array}{\|l} 15 \\ 37 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 36 \\ 36 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 24 \\ 57 \\ \hline \end{array}$ |  | 40 | $\begin{array}{\|l} \hline 26 \\ 36 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline \mathbf{3 1} \\ 43 \\ \hline \end{array}$ | $\begin{array}{\|l} 53 \\ 55 \\ \hline \end{array}$ |  |
| 14 |  | 7 | $\begin{array}{r} 9 \\ 40 \\ \hline \end{array}$ | $\begin{aligned} & 39 \\ & 11 \end{aligned}$ | $\begin{aligned} & 6 \\ & 3 \\ & \hline \end{aligned}$ |  | 46 | $\begin{array}{\|l} 55 \\ 39 \\ \hline \end{array}$ | $\begin{aligned} & 42 \\ & 20 \end{aligned}$ | $\begin{array}{r} 48 \\ 6 \end{array}$ |  | 25 | $\begin{aligned} & \hline 50 \\ & 38 \\ & \hline \end{aligned}$ | $\begin{aligned} & 28 \\ & 28 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline \mathbf{2 6} \\ \mathbf{2 7} \\ \hline \end{array}$ |  | 3 | $\begin{array}{\|l} 53 \\ 37 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 13 \\ 36 \\ \hline \end{array}$ | $\begin{array}{r} 21 \\ \hline 4 \\ \hline \end{array}$ |  | 41 | $\begin{array}{\|r} 3 \\ 36 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 15 \\ 43 \\ \hline \end{array}$ | $\begin{gathered} 48 \\ 0 \end{gathered}$ |  |
| 15 |  | 7 | $\begin{array}{\|l} \hline 49 \\ 40 \\ \hline \end{array}$ | $\begin{aligned} & 50 \\ & 10 \end{aligned}$ | $\begin{array}{r} 9 \\ 12 \\ \hline \end{array}$ |  | 47 | $\begin{aligned} & 35 \\ & 39 \end{aligned}$ | $\begin{array}{r} 2 \\ 19 \\ \hline \end{array}$ | $\begin{array}{\|l} 54 \\ 15 \\ \hline \end{array}$ |  | 26 | $\begin{aligned} & \mathbf{2 8} \\ & 38 \\ & \hline \end{aligned}$ | $\begin{aligned} & 56 \\ & 27 \end{aligned}$ | $\begin{array}{\|l} 53 \\ 34 \\ \hline \end{array}$ |  | 4 | $\begin{array}{\|l} 30 \\ 37 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 49 \\ 35 \\ \hline \end{array}$ | $\begin{aligned} & 25 \\ & 11 \end{aligned}$ |  | 41 | $\begin{array}{\|l} 39 \\ 36 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 58 \\ 4^{2} \\ \hline \end{array}$ | $\begin{array}{r} 48 \\ 8 \end{array}$ |  |
| 16 |  | 8 | $\begin{array}{\|l} 30 \\ 40 \\ \hline \end{array}$ | $\begin{aligned} & \hline \mathbf{o} \\ & 9 \\ & \hline \end{aligned}$ | $\begin{aligned} & 21 \\ & 22 \end{aligned}$ |  | 48 | $\begin{aligned} & \mathbf{1 4} \\ & 39 \\ & \hline \end{aligned}$ | $\begin{aligned} & 22 \\ & 18 \end{aligned}$ | $\begin{array}{r} 9 \\ 24 \\ \hline \end{array}$ |  | 27 | $\begin{array}{r} 7 \\ 3^{8} \\ \hline \end{array}$ | $\begin{aligned} & 24 \\ & 26 \end{aligned}$ | $\begin{array}{\|l} \hline \mathbf{2 7} \\ 42 \end{array}$ |  | 5 | 8 <br> 37 | $\begin{array}{\|l\|} \hline 24 \\ 34 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 36 \\ 19 \\ \hline \end{array}$ |  | 42 | $\begin{array}{\|l} \hline 16 \\ 36 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 40 \\ 41 \\ \hline \end{array}$ | $\begin{aligned} & 56 \\ & 14 \end{aligned}$ |  |
| 17 |  | 9 | $\begin{array}{\|l} \hline 10 \\ 40 \\ \hline \end{array}$ | $\begin{aligned} & \hline 9 \\ & 8 \end{aligned}$ | $\begin{aligned} & \hline 43 \\ & 31 \\ & \hline \end{aligned}$ |  | 48 | $\begin{aligned} & 53 \\ & 39 \end{aligned}$ | $\begin{array}{\|l} \hline 40 \\ 17 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 33 \\ 32 \\ \hline \end{array}$ |  | 27 | $\begin{aligned} & 45 \\ & 38 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 51 \\ 25 \\ \hline \end{array}$ | $\begin{array}{r} 9 \\ 50 \\ \hline \end{array}$ |  | 5 | $\begin{aligned} & 45 \\ & 37 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 58 \\ 33 \\ \hline \end{array}$ | $\begin{aligned} & 55 \\ & 26 \\ & \hline \end{aligned}$ |  | 42 | $\begin{array}{\|l} \hline 53 \\ 36 \\ \hline \end{array}$ | $\begin{aligned} & 22 \\ & 40 \\ & \hline \end{aligned}$ | $\begin{aligned} & 10 \\ & 21 \end{aligned}$ |  |
| 18 |  | 9 | $\begin{aligned} & 50 \\ & 40 \end{aligned}$ | $\begin{array}{r} 18 \\ \hline 7 \end{array}$ | $\begin{aligned} & \hline 14 \\ & 41 \\ & \hline \end{aligned}$ |  | 49 | $\begin{aligned} & \mathbf{3 2}^{2} \\ & 39 \\ & \hline \end{aligned}$ | $\begin{aligned} & 58 \\ & 16 \end{aligned}$ | $\begin{array}{r} 5 \\ 41 \end{array}$ |  | 28 | $\begin{array}{\|l\|} \hline 24 \\ 38 \end{array}$ | $\begin{aligned} & \hline 16 \\ & 24 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 59 \\ 58 \\ \hline \end{array}$ |  | 6 | $\begin{array}{\|l} 23 \\ 37 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 3^{2} \\ 32 \\ \hline \end{array}$ | $\begin{array}{\|l} \mathbf{2 1} \\ 33 \\ \hline \end{array}$ |  | 43 | $\begin{aligned} & 30 \\ & 36 \end{aligned}$ | $\begin{array}{r} \mathbf{2} \\ 39 \\ \hline \end{array}$ | $\begin{array}{\|l} \mathbf{3 1} \\ \mathbf{2 7} \end{array}$ |  |
| 19 |  | 10 | $\begin{array}{\|l} \hline 30 \\ 40 \\ \hline \end{array}$ | $\begin{array}{r} 25 \\ 6 \end{array}$ | $\begin{aligned} & \hline 55 \\ & 49 \\ & \hline \end{aligned}$ |  | 50 | $\begin{aligned} & \mathbf{1 2} \\ & 39 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 14 \\ 15 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 46 \\ 49 \\ \hline \end{array}$ |  | 29 | $\begin{array}{r} 2 \\ 3^{8} \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{4 1} \\ & \mathbf{2 4} \\ & \hline \end{aligned}$ | $\begin{array}{r} 57 \\ 6 \end{array}$ |  | 7 | $\begin{array}{\|r} \hline \mathbf{1} \\ 37 \\ \hline \end{array}$ | $\begin{array}{\|r\|} \hline 4 \\ 31 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 54 \\ 41 \\ \hline \end{array}$ |  | 44 | $\begin{array}{\|r} \hline 6 \\ 36 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline \mathbf{4 1} \\ \mathbf{3}^{8} \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 58 \\ 33 \\ \hline \end{array}$ |  |
| 20 | 46 | 11 | $\begin{aligned} & 10 \\ & 40 \end{aligned}$ | $\begin{array}{r} 32 \\ 6 \end{array}$ | $\begin{gathered} 44 \\ 0 \end{gathered}$ | 46 | 50 | $\begin{array}{\|l} \mathbf{5 1} \\ 39 \\ \hline \end{array}$ | $\begin{array}{\|l} 30 \\ 14 \\ \hline \end{array}$ | $\begin{aligned} & 35 \\ & 58 \\ & \hline \end{aligned}$ | 47 | 29 | $\begin{aligned} & \hline \mathbf{4 1} \\ & 38 \end{aligned}$ | $\begin{array}{r} 6 \\ 23 \\ \hline \end{array}$ | $\begin{array}{\|r} 3 \\ 14 \\ \hline \end{array}$ | 48 | 7 | $\begin{aligned} & \hline 38 \\ & 37 \end{aligned}$ | $\begin{aligned} & 36 \\ & 30 \\ & \hline \end{aligned}$ | $\begin{array}{\|} 35 \\ 47 \\ \hline \end{array}$ | 48 | 44 | $\begin{aligned} & 43 \\ & 36 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 20 \\ 37 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline \mathbf{3 1} \\ \mathbf{4}^{1} \\ \hline \end{array}$ |  |
| 21 |  | 11 | $\begin{array}{\|l} \hline 50 \\ 40 \\ \hline \end{array}$ | $\begin{array}{\|r\|} \hline 38 \\ 5 \\ \hline \end{array}$ | $\begin{array}{r} 44 \\ \hline 8 \end{array}$ |  | 51 | $\begin{aligned} & \mathbf{3 0} \\ & 39 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 45 \\ 14 \\ \hline \end{array}$ | $\begin{array}{\|r\|} \hline 33 \\ 7 \\ \hline \end{array}$ |  | 30 | $\begin{array}{\|l} \hline 19 \\ 38 \\ \hline \end{array}$ | $\begin{array}{\|l} 29 \\ 22 \end{array}$ | $\begin{array}{\|l} \mathbf{1 7} \\ \mathbf{2 2} \end{array}$ |  | 8 | $\begin{aligned} & \mathbf{1 6} \\ & 37 \\ & \hline \end{aligned}$ | $\begin{array}{r} 7 \\ 29 \\ \hline \end{array}$ | $\begin{array}{\|} \mathbf{2 2} \\ 55 \\ \hline \end{array}$ |  | 45 | $\begin{array}{\|l} \hline 19 \\ 36 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 58 \\ 36 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 12 \\ 47 \\ \hline \end{array}$ |  |
| 22 |  | 12 | $\begin{array}{\|l} \hline 30 \\ 40 \\ \hline \end{array}$ | $\begin{array}{r} 43 \\ 4 \\ \hline \end{array}$ | $\begin{aligned} & 52 \\ & 18 \end{aligned}$ |  | 52 | $\begin{array}{r} 9 \\ 39 \end{array}$ | $\begin{array}{\|l} \hline 59 \\ 13 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 40 \\ 15 \\ \hline \end{array}$ |  | 30 | $\begin{array}{\|l} \hline 57 \\ 38 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{5 1} \\ & \mathbf{2 1} \end{aligned}$ | $\begin{aligned} & 39 \\ & 30 \end{aligned}$ |  | 8 | $\begin{aligned} & 53 \\ & 37 \\ & \hline \end{aligned}$ | $\begin{aligned} & 37 \\ & 29 \\ & \hline \end{aligned}$ | $\begin{array}{r} 17 \\ 2 \end{array}$ |  | 45 | $\begin{aligned} & \hline 56 \\ & 3^{6} \\ & \hline \end{aligned}$ | $\begin{aligned} & 34 \\ & 35 \end{aligned}$ | $\begin{array}{\|l} \hline 59 \\ 53 \\ \hline \end{array}$ |  |
| 23 |  | 13 | $\begin{array}{\|l} \hline 10 \\ 40 \\ \hline \end{array}$ | $\begin{gathered} 48 \\ 3 \end{gathered}$ | $\begin{aligned} & 10 \\ & 28 \end{aligned}$ |  | 52 | $\begin{array}{\|l} 49 \\ 39 \\ \hline \end{array}$ | $\begin{aligned} & 12 \\ & 12 \end{aligned}$ | $\begin{array}{\|l} 55 \\ 24 \\ \hline \end{array}$ |  | 31 | $\begin{array}{\|l\|} \hline 36 \\ 38 \\ \hline \end{array}$ | $\begin{array}{\|l} 13 \\ 20 \\ \hline \end{array}$ | $\begin{array}{r} 9 \\ 3^{8} \\ \hline \end{array}$ |  | 9 | $\begin{array}{\|l\|} \hline \mathbf{3 1} \\ 37 \\ \hline \end{array}$ | $\begin{array}{r} 6 \\ 28 \end{array}$ | $\begin{aligned} & 19 \\ & 10 \end{aligned}$ |  | 46 | $\begin{array}{\|l} \hline 33 \\ 36 \\ \hline \end{array}$ | $\begin{array}{\|l} \mathbf{1 0} \\ 35 \\ \hline \end{array}$ | $\begin{array}{r} 52 \\ 0 \end{array}$ |  |
| 24 |  | 13 | $\begin{array}{\|l} \hline 50 \\ 40 \\ \hline \end{array}$ | $\begin{array}{r} 51 \\ 21 \end{array}$ | $\begin{aligned} & 38 \\ & 3^{6} \\ & \hline \end{aligned}$ |  | 53 | $\begin{aligned} & \mathbf{2 8} \\ & 39 \end{aligned}$ | $\begin{aligned} & 25 \\ & 11 \\ & \hline \end{aligned}$ | $\begin{aligned} & 19 \\ & 33 \end{aligned}$ |  | 32 | $\begin{array}{\|l\|} \hline 14 \\ 38 \\ \hline \end{array}$ | $\begin{array}{\|l} 33 \\ 19 \\ \hline \end{array}$ | $\begin{array}{\|l} 47 \\ 45 \\ \hline \end{array}$ |  | 10 | $\begin{array}{\|r} \hline 8 \\ 37 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 34 \\ 27 \\ \hline \end{array}$ | $\begin{aligned} & 29 \\ & 16 \\ & \hline \end{aligned}$ |  | 47 | $\begin{array}{r} 9 \\ 3^{6} \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 45 \\ 34 \\ \hline \end{array}$ | $\begin{array}{r} 52 \\ 6 \end{array}$ |  |
| 25 |  | 14 | $\begin{array}{\|l} \hline 30 \\ 40 \\ \hline \end{array}$ | $54$ | $\begin{array}{\|l\|} \hline 14 \\ 46 \\ \hline \end{array}$ |  | 54 | $\begin{array}{r} 7 \\ 39 \\ \hline \end{array}$ | $\begin{aligned} & 36 \\ & 10 \end{aligned}$ | $\begin{array}{\|l} \hline 5^{2} \\ 41 \\ \hline \end{array}$ |  | 32 | $\begin{array}{\|l\|} \hline 52 \\ 38 \\ \hline \end{array}$ | $\begin{aligned} & 53 \\ & 18 \\ & \hline \end{aligned}$ | $\begin{aligned} & \hline \mathbf{3 2} \\ & 54 \\ & \hline \end{aligned}$ |  | 10 | $\begin{aligned} & 4^{6} \\ & 37 \\ & \hline \end{aligned}$ | $\begin{array}{r} 1 \\ 26 \end{array}$ | $\begin{array}{\|l\|} \hline 45 \\ 24 \\ \hline \end{array}$ |  | 47 | $\begin{array}{\|l} \hline 46 \\ 36 \\ \hline \end{array}$ | $\begin{aligned} & \hline 19 \\ & 33 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 58 \\ 13 \\ \hline \end{array}$ |  |
| 26 |  | 15 | $\begin{array}{\|l} \hline 10 \\ 40 \\ \hline \end{array}$ | $\begin{gathered} 56 \\ 0 \end{gathered}$ | $\begin{array}{r} \mathbf{0} \\ 55 \\ \hline \end{array}$ |  | 54 | $\begin{aligned} & 46 \\ & 39 \end{aligned}$ | $\begin{array}{r} 47 \\ \hline 9 \\ \hline \end{array}$ | $\begin{aligned} & 33 \\ & 50 \\ & \hline \end{aligned}$ |  | 33 | $\begin{array}{\|l\|} \hline \mathbf{3 1} \\ 38 \\ \hline \end{array}$ | $\begin{aligned} & 12 \\ & 18 \end{aligned}$ | $\begin{array}{r} 26 \\ 1 \end{array}$ |  | 11 | $\begin{array}{\|l} 23 \\ 37 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 28 \\ 25 \\ \hline \end{array}$ | $\begin{array}{\|r} 9 \\ 31 \\ \hline \end{array}$ |  | 48 | $\begin{aligned} & 22 \\ & 36 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 53 \\ 32 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 11 \\ 19 \\ \hline \end{array}$ |  |
| 27 |  | 15 | $\begin{array}{\|l} \hline 50 \\ 40 \\ \hline \end{array}$ | $\begin{gathered} 56 \\ 0 \end{gathered}$ | $\begin{array}{r} 55 \\ 5 \\ \hline \end{array}$ |  | 55 | $\begin{aligned} & 25 \\ & 39 \\ & \hline \end{aligned}$ | $\begin{array}{r} 57 \\ 8 \end{array}$ | $\begin{array}{\|l} 23 \\ 58 \\ \hline \end{array}$ |  | 34 | $\begin{array}{r} 9 \\ 38 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline \mathbf{3 0} \\ \mathbf{1 7} \\ \hline \end{array}$ | $\begin{array}{r} 27 \\ 9 \\ \hline \end{array}$ |  | 12 | $\begin{array}{\|r} \mathbf{o} \\ 37 \\ \hline \end{array}$ | $\begin{array}{\|l} 53 \\ 24 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 40 \\ 38 \\ \hline \end{array}$ |  | 48 | $\begin{array}{\|l} \hline 59 \\ 36 \\ \hline \end{array}$ | $\begin{aligned} & 25 \\ & 31 \\ & \hline \end{aligned}$ | $\begin{aligned} & 30 \\ & 26 \end{aligned}$ | 7 |
| 28 |  | 16 | $\begin{aligned} & 30 \\ & 39 \end{aligned}$ | $\begin{aligned} & 57 \\ & 59 \\ & \hline \end{aligned}$ | $\begin{array}{r} \mathbf{0} \\ 13 \\ \hline \end{array}$ |  | 56 | $\begin{array}{r} 5 \\ 39 \end{array}$ | $\begin{aligned} & \hline 6 \\ & 8 \end{aligned}$ | $\begin{array}{r} 21 \\ 7 \\ \hline \end{array}$ |  | 34 | $\begin{aligned} & 47 \\ & 38 \\ & \hline \end{aligned}$ | $\begin{aligned} & 47 \\ & 16 \end{aligned}$ | $\begin{aligned} & \hline 3^{6} \\ & 17 \end{aligned}$ |  | 12 | $\begin{aligned} & 3^{8} \\ & 37 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 18 \\ 23 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline \mathbf{1 8} \\ \mathbf{4 5} \\ \hline \end{array}$ |  | 49 | $\begin{aligned} & 35 \\ & 36 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 56 \\ 30 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 56 \\ 32 \\ \hline \end{array}$ | 8 |
| 29 |  | 17 | $\begin{array}{\|l} \mathbf{1 0} \\ 39 \\ \hline \end{array}$ | $\begin{aligned} & 56 \\ & 58 \\ & \hline \end{aligned}$ | $\begin{aligned} & 13 \\ & 23 \\ & \hline \end{aligned}$ |  | 56 | $\begin{array}{\|l} 44 \\ 39 \\ \hline \end{array}$ | $\begin{array}{r} 14 \\ 7 \\ \hline \end{array}$ | $\begin{aligned} & 28 \\ & 15 \end{aligned}$ |  | 35 | $\begin{aligned} & 26 \\ & 38 \\ & \hline \end{aligned}$ | $\begin{array}{r} 3 \\ 15 \\ \hline \end{array}$ | $\begin{array}{\|l} 53 \\ 24 \end{array}$ |  | 13 | $\begin{array}{\|l} 15 \\ 37 \\ \hline \end{array}$ | $\begin{aligned} & 42 \\ & 22 \end{aligned}$ | $\begin{array}{r} 3 \\ 52 \\ \hline \end{array}$ |  | 50 | $\begin{array}{\|l} 12 \\ 36 \\ \hline \end{array}$ | $\begin{array}{\|l} 27 \\ 29 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{2 8} \\ & 39 \end{aligned}$ |  |
| 30 | 46 | 17 | $\begin{aligned} & 50 \\ & 39 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \mathbf{5 4} \\ 57 \\ \hline \end{array}$ | $\begin{aligned} & 36 \\ & 32 \end{aligned}$ | 46 | 57 | $\begin{array}{\|l} 23 \\ 39 \\ \hline \end{array}$ | $\begin{array}{r} 21 \\ 6 \end{array}$ | $\begin{array}{\|l} 43 \\ 24 \end{array}$ | 47 | 36 | $\begin{array}{\|r} 4 \\ 38 \\ \hline \end{array}$ | $\begin{array}{\|l} 19 \\ 14 \end{array}$ | $\begin{array}{\|l} \hline \mathbf{1 7} \\ 33 \end{array}$ | 48 | 13 | $\begin{array}{\|l} 53 \\ 37 \\ \hline \end{array}$ | $\begin{array}{r} 4 \\ 21 \end{array}$ | $\begin{array}{\|} \mathbf{5 5} \\ 59 \\ \hline \end{array}$ | 48 | 50 | $\begin{aligned} & 48 \\ & 36 \\ & \hline \end{aligned}$ | $\begin{aligned} & 57 \\ & 28 \\ & \hline \end{aligned}$ | $\begin{array}{r} 7 \\ 45 \\ \hline \end{array}$ |  |

Bürgi's 1' sine table (reconstruction, D. Roegel, 2016)

| 1 | $50^{\circ}$ |  |  |  |  | $51^{\circ}$ |  |  |  |  | $52^{\circ}$ |  |  |  |  | $53^{\circ}$ |  |  |  |  | $54^{\circ}$ |  |  |  |  | , |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 30 | 46 | 17 | $\begin{array}{\|l\|} \hline \mathbf{5 0} \\ \mathbf{3 9} \end{array}$ | $\begin{aligned} & \mathbf{5 4} \\ & 57 \end{aligned}$ | $\begin{aligned} & 36 \\ & 32 \end{aligned}$ | 46 | 57 | $\begin{aligned} & 23 \\ & 39 \end{aligned}$ | $\begin{array}{r} 21 \\ 6 \end{array}$ | $\begin{aligned} & 43 \\ & 24 \end{aligned}$ | 47 | $3^{6}$ | $\begin{array}{\|r\|} \hline 4 \\ 38 \\ \hline \end{array}$ | $\begin{aligned} & 19 \\ & 14 \end{aligned}$ | $\begin{aligned} & \mathbf{1 7} \\ & 33 \end{aligned}$ | 48 | 13 | $\begin{array}{\|l\|} \hline 53 \\ 37 \\ \hline \end{array}$ | $\begin{array}{r} 4 \\ 21 \end{array}$ | $\begin{aligned} & 55 \\ & 59 \end{aligned}$ | 48 | 50 | $\begin{array}{l\|} \hline 48 \\ 36 \end{array}$ | $\begin{aligned} & 57 \\ & 28 \end{aligned}$ | $\begin{array}{r} 7 \\ 45 \\ \hline \end{array}$ | 30 |
| 31 |  | 18 | $\begin{array}{\|l\|} \hline 30 \\ 39 \\ \hline \end{array}$ | $\begin{aligned} & 52 \\ & 56 \\ & 56 \end{aligned}$ | $\begin{array}{r} 8 \\ 41 \end{array}$ |  | 58 | $\begin{array}{r} 2 \\ 39 \\ \hline \end{array}$ | $\begin{array}{r} 28 \\ 5 \\ \hline \end{array}$ | $\begin{array}{r} 7 \\ 3^{2} \\ \hline \end{array}$ |  | 36 | $\begin{aligned} & 42 \\ & 38 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 33 \\ 13 \\ \hline \end{array}$ | $\begin{aligned} & 50 \\ & 40 \end{aligned}$ |  | 14 | $\begin{array}{\|l\|} \hline \mathbf{3 0} \\ 37 \\ \hline \end{array}$ | $\begin{aligned} & 26 \\ & 21 \end{aligned}$ | $\begin{array}{\|r\|} \hline 54 \\ \hline \end{array}$ |  | 51 | $\begin{aligned} & 25 \\ & 36 \end{aligned}$ | $\begin{array}{\|l\|} \hline 25 \\ 27 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 52 \\ 52 \\ \hline \end{array}$ | 31 |
| 32 |  | 19 | $\begin{aligned} & 10 \\ & 39 \\ & \hline \end{aligned}$ | $\begin{aligned} & 48 \\ & 55 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 49 \\ 51 \\ \hline \end{array}$ |  | 58 | $\begin{aligned} & \mathbf{4 1} \\ & 39 \\ & \hline \end{aligned}$ | $\begin{array}{\|r} \hline 33 \\ 4 \\ \hline \end{array}$ | $\begin{aligned} & 39 \\ & 40 \end{aligned}$ |  | 37 | $\begin{aligned} & 20 \\ & 38 \end{aligned}$ | $\begin{array}{\|l} 47 \\ 12 \end{array}$ | $\begin{aligned} & 30 \\ & 48 \\ & \hline \end{aligned}$ |  | 15 | $\begin{array}{r} 7 \\ 37 \\ \hline \end{array}$ | $\begin{aligned} & 48 \\ & 20 \end{aligned}$ | $\begin{array}{r} 1 \\ 13 \\ \hline \end{array}$ |  | 52 | $\begin{array}{\|r} \hline \mathbf{1} \\ 3^{6} \\ \hline \end{array}$ | $\begin{aligned} & 53 \\ & 26 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 44 \\ 58 \\ \hline \end{array}$ | 32 |
| 33 |  | 19 | $\begin{array}{\|l\|} \hline 50 \\ 39 \\ \hline \end{array}$ | $\begin{aligned} & 44 \\ & 55 \\ & \hline \end{aligned}$ | $\begin{gathered} 40 \\ 0 \end{gathered}$ |  | 59 | $\begin{aligned} & 20 \\ & 39 \end{aligned}$ | $\begin{array}{r} 38 \\ 3 \\ \hline \end{array}$ | $\begin{aligned} & 19 \\ & 50 \end{aligned}$ |  | 37 | $\begin{array}{\|l} 59 \\ 38 \\ \hline \end{array}$ | $\begin{array}{r} \mathbf{0} \\ 11 \end{array}$ | $\begin{aligned} & 18 \\ & 56 \end{aligned}$ |  | 15 | $\begin{aligned} & 45 \\ & 37 \end{aligned}$ | $\begin{array}{r} 8 \\ 19 \\ \hline \end{array}$ | $\begin{array}{\|l\|} 14 \\ 21 \end{array}$ |  | 52 | $\begin{array}{\|l\|} \hline 38 \\ 36 \end{array}$ | $\begin{array}{\|l} 20 \\ 26 \\ \hline \end{array}$ | $\begin{array}{r} 42 \\ 4 \\ \hline \end{array}$ | 33 |
| 34 |  | 20 | $\begin{array}{\|l\|} \hline 30 \\ 39 \\ \hline \end{array}$ | $\begin{aligned} & 39 \\ & 54 \end{aligned}$ | $\begin{array}{r} 40 \\ 9 \end{array}$ |  | 59 | $\begin{array}{\|l} 59 \\ 39 \\ \hline \end{array}$ | $\begin{array}{r} 42 \\ 2 \end{array}$ | $\begin{array}{r} \mathbf{9} \\ 57 \\ \hline \end{array}$ |  | $3^{8}$ | $\begin{array}{\|l} 37 \\ 38 \\ \hline \end{array}$ | $\begin{aligned} & 12 \\ & 11 \end{aligned}$ | $\begin{array}{r} 14 \\ 4 \\ \hline \end{array}$ |  | 16 | $\begin{array}{\|l\|} \hline 22 \\ 37 \\ \hline \end{array}$ | $\begin{aligned} & 27 \\ & 18 \end{aligned}$ | $\begin{array}{\|l} 35 \\ 27 \\ \hline \end{array}$ |  | 53 | $\begin{aligned} & 14 \\ & 36 \end{aligned}$ | $\begin{aligned} & 46 \\ & 25 \\ & \hline \end{aligned}$ | $\begin{aligned} & \hline 46 \\ & 11 \end{aligned}$ | 34 |
| 35 |  | 21 | $\begin{aligned} & \mathbf{1 0} \\ & 39 \\ & \hline \end{aligned}$ | $\begin{aligned} & 33 \\ & 53 \\ & \hline \end{aligned}$ | $\begin{aligned} & 49 \\ & 18 \end{aligned}$ | 47 | 0 | $\begin{aligned} & 38 \\ & 39 \end{aligned}$ | $\begin{array}{r} 45 \\ 2 \end{array}$ | $\begin{aligned} & 6 \\ & 6 \end{aligned}$ |  | 39 | $\begin{aligned} & 15 \\ & 3^{8} \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 23 \\ 10 \end{array}$ | $\begin{aligned} & 18 \\ & 11 \end{aligned}$ |  | 16 | $\begin{array}{\|l} 59 \\ 37 \\ \hline \end{array}$ | $\begin{aligned} & 46 \\ & 17 \end{aligned}$ | $\begin{array}{r} 2 \\ 35 \\ \hline \end{array}$ |  | 53 | $\begin{aligned} & \mathbf{5 1} \\ & 3^{6} \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 11 \\ 24 \\ \hline \end{array}$ | $\begin{array}{\|l} 57 \\ 17 \\ \hline \end{array}$ | 35 |
| 36 |  | 21 | $\begin{array}{\|l\|} \hline 50 \\ 39 \end{array}$ | $\begin{aligned} & 27 \\ & 52 \end{aligned}$ | $\begin{array}{\|r\|} \hline 7 \\ 27 \\ \hline \end{array}$ |  | 1 | $\begin{array}{\|l} \mathbf{1 7} \\ \mathbf{3 9} \end{array}$ | $\begin{array}{r} 47 \\ \hline 1 \end{array}$ | $\begin{array}{\|l} 12 \\ 15 \\ \hline \end{array}$ |  | 39 | $\begin{array}{\|l} 53 \\ 38 \\ \hline \end{array}$ | $\begin{array}{r} 33 \\ 9 \end{array}$ | $\begin{array}{\|l\|} \hline 29 \\ 19 \end{array}$ |  | 17 | $\begin{aligned} & 37 \\ & 37 \end{aligned}$ | $\begin{array}{r} 3 \\ 16 \end{array}$ | $\begin{array}{\|l} 37 \\ 42 \\ \hline \end{array}$ |  | 54 | $\begin{aligned} & 27 \\ & 36 \end{aligned}$ | $\begin{aligned} & 36 \\ & 23 \end{aligned}$ | $14$ | 36 |
| 37 |  | 22 | $\begin{array}{\|l\|} \hline 30 \\ 39 \\ \hline \end{array}$ | $\begin{aligned} & 19 \\ & 51 \end{aligned}$ | $\begin{array}{\|l\|} \hline 34 \\ 36 \\ \hline \end{array}$ |  | 1 | $\begin{aligned} & 56 \\ & 39 \end{aligned}$ | $\begin{array}{r} 48 \\ 0 \end{array}$ | $\begin{aligned} & 27 \\ & 23 \\ & \hline \end{aligned}$ |  | 40 | $\begin{array}{\|l} \mathbf{3 1} \\ 38 \\ \hline \end{array}$ | $\begin{array}{r} 42 \\ 8 \end{array}$ | $\begin{aligned} & 48 \\ & 27 \end{aligned}$ |  | 18 | $\begin{aligned} & \mathbf{1 4} \\ & 37 \end{aligned}$ | $\begin{aligned} & 20 \\ & 15 \end{aligned}$ | $\begin{array}{\|l} 19 \\ 48 \\ \hline \end{array}$ |  | 55 | $\begin{array}{r} 3 \\ 36 \\ \hline \end{array}$ | $\begin{aligned} & 59 \\ & 22 \end{aligned}$ | $\begin{aligned} & 37 \\ & 30 \\ & \hline \end{aligned}$ | 37 |
| $3^{8}$ |  | 23 | $\begin{array}{\|l\|} \hline \mathbf{1 0} \\ 39 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 11 \\ 50 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 10 \\ 46 \\ \hline \end{array}$ |  | 2 | $\begin{aligned} & 35 \\ & 3^{8} \\ & \hline \end{aligned}$ | $\begin{aligned} & 48 \\ & 59 \\ & \hline \end{aligned}$ | $\begin{aligned} & 50 \\ & 3^{1} \\ & \hline \end{aligned}$ |  | 41 | $\begin{array}{r} 9 \\ 3^{8} \\ \hline \end{array}$ | $\begin{array}{r} 51 \\ \hline 7 \\ \hline \end{array}$ | $\begin{aligned} & \hline 15 \\ & 34 \\ & \hline \end{aligned}$ |  | 18 | $\begin{array}{\|l\|} \hline \mathbf{5 1} \\ 37 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 36 \\ 14 \\ \hline \end{array}$ | $\begin{array}{r} 7 \\ 5^{6} \\ \hline \end{array}$ |  | 55 | $\begin{array}{l\|} \hline 40 \\ 36 \\ \hline \end{array}$ | $\begin{aligned} & 22 \\ & 21 \end{aligned}$ | $\begin{array}{\|r} \hline 7 \\ 37 \\ \hline \end{array}$ | $3^{8}$ |
| 39 |  | 23 | $\begin{array}{\|l\|} \hline 50 \\ 39 \\ \hline \end{array}$ | $\begin{array}{\|r} \mathbf{1} \\ 49 \\ \hline \end{array}$ | $\begin{array}{\|l} 56 \\ 55 \\ \hline \end{array}$ |  | 3 | $\begin{array}{\|l} 14 \\ 38 \\ \hline \end{array}$ | $\begin{aligned} & 48 \\ & 58 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} 21 \\ 40 \\ \hline \end{array}$ |  | 41 | $\begin{array}{\|l} 47 \\ 38 \\ \hline \end{array}$ | $\begin{array}{r} 58 \\ 6 \end{array}$ | $\begin{aligned} & 49 \\ & 42 \\ & \hline \end{aligned}$ |  | 19 | $\begin{aligned} & 28 \\ & 37 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 51 \\ 14 \end{array}$ | $\begin{aligned} & \mathbf{3} \\ & 3 \\ & \hline \end{aligned}$ |  | 56 | $\begin{aligned} & 16 \\ & 36 \end{aligned}$ | $\begin{aligned} & 43 \\ & 20 \end{aligned}$ | $\begin{array}{\|l\|} \hline 44 \\ 42 \\ \hline \end{array}$ | 39 |
| 40 | 46 | 24 | $\begin{aligned} & 29 \\ & 39 \end{aligned}$ | $\begin{array}{\|l} \mathbf{5 1} \\ 49 \\ \hline \end{array}$ | $\begin{array}{r} \mathbf{5 1} \\ 3 \end{array}$ | 47 | 3 | $\begin{array}{\|l} 53 \\ 38 \\ \hline \end{array}$ | $\begin{aligned} & 47 \\ & 57 \end{aligned}$ | $\begin{array}{r} 1 \\ 4^{8} \\ \hline \end{array}$ | 47 | 42 | $\begin{aligned} & 26 \\ & 38 \\ & \hline \end{aligned}$ | $\begin{aligned} & 5 \\ & 5 \\ & \hline \end{aligned}$ | $\begin{aligned} & \hline \mathbf{3 1}^{1} \\ & 50 \end{aligned}$ | 48 | 20 | $\begin{array}{\|r\|} \hline 6 \\ 37 \\ \hline \end{array}$ | $\begin{array}{r} 5 \\ 13 \\ \hline \end{array}$ | $\begin{array}{r} 6 \\ 10 \end{array}$ | 48 | 56 | $\begin{aligned} & 53 \\ & 36 \\ & \hline \end{aligned}$ | $\begin{array}{r} 4 \\ 19 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{2 6} \\ & 49 \end{aligned}$ | 40 |
| 41 |  | 25 | $\begin{array}{\|r\|} \hline 9 \\ 39 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 40 \\ 48 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 54 \\ 13 \\ \hline \end{array}$ |  | 4 | $\begin{aligned} & 32 \\ & 38 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 44 \\ 56 \\ \hline \end{array}$ | $\begin{aligned} & 49 \\ & 57 \\ & \hline \end{aligned}$ |  | 43 | $\begin{array}{r\|} \hline 4 \\ 38 \\ \hline \end{array}$ | $\begin{array}{r} 11 \\ \hline 4 \\ \hline \end{array}$ | $\begin{array}{\|l} 21 \\ 58 \\ \hline \end{array}$ |  | 20 | $\begin{aligned} & 43 \\ & 37 \\ & \hline \end{aligned}$ | $\begin{aligned} & 18 \\ & 12 \end{aligned}$ | $\begin{aligned} & 16 \\ & 16 \end{aligned}$ |  | 57 | $\begin{aligned} & 29 \\ & 36 \\ & \hline \end{aligned}$ | $\begin{aligned} & 24 \\ & 18 \end{aligned}$ | $\begin{array}{\|l\|} \hline 15 \\ 55 \\ \hline \end{array}$ | 41 |
| 42 |  | 25 | $\begin{aligned} & 49 \\ & 39 \end{aligned}$ | $\begin{array}{\|l\|} \hline 29 \\ 47 \\ \hline \end{array}$ | $\begin{array}{\|r\|} \hline 7 \\ 22 \\ \hline \end{array}$ |  | 5 | $\begin{array}{\|l\|} \mathbf{1 1} \\ 3^{8} \\ \hline \end{array}$ | $\begin{array}{\|l} \hline \mathbf{4 1} \\ 56 \\ \hline \end{array}$ | $\begin{array}{r} 46 \\ 5 \\ \hline \end{array}$ |  | 43 | $\begin{array}{\|l} 42 \\ 38 \\ \hline \end{array}$ | $\begin{array}{r} 16 \\ \hline 4 \\ \hline \end{array}$ | $\begin{array}{r} 19 \\ \hline \\ \hline \end{array}$ |  | 21 | $\begin{array}{\|l\|} \hline 20 \\ 37 \\ \hline \end{array}$ | $\begin{aligned} & 30 \\ & 11 \end{aligned}$ | $\begin{aligned} & \mathbf{3 2}^{2} \\ & 24 \end{aligned}$ |  | 58 | $\begin{array}{r} 5 \\ 36 \\ \hline \end{array}$ | $\begin{aligned} & 43 \\ & 18 \end{aligned}$ | $\begin{array}{r} 10 \\ 2 \end{array}$ | 42 |
| 43 |  | 26 | $\begin{aligned} & 29 \\ & 39 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 16 \\ 46 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 29 \\ 31 \\ \hline \end{array}$ |  | 5 | $\begin{aligned} & 50 \\ & 38 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 37 \\ 55 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{5 1} \\ & 13 \end{aligned}$ |  | 44 | $\begin{aligned} & 20 \\ & 38 \\ & \hline \end{aligned}$ | $\begin{array}{r} 20 \\ 3 \end{array}$ | $\begin{aligned} & 24 \\ & 13 \\ & \hline \end{aligned}$ |  | 21 | $\begin{aligned} & 57 \\ & 37 \\ & \hline \end{aligned}$ | $\begin{aligned} & 41 \\ & 10 \end{aligned}$ | $\begin{aligned} & 56 \\ & 3^{1} \\ & \hline \end{aligned}$ |  | 58 | $\begin{aligned} & 42 \\ & 36 \end{aligned}$ | 1 17 | $\begin{array}{\|r} \hline 12 \\ \hline \end{array}$ | 43 |
| 44 |  | 27 | $\begin{array}{\|r\|} \hline 9 \\ 39 \\ \hline \end{array}$ | $\begin{array}{r} 3 \\ 45 \\ \hline \end{array}$ | $\begin{array}{r} 10 \\ 40 \\ \hline \end{array}$ |  | 6 | $\begin{array}{\|l} 29 \\ 38 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 33 \\ 54 \\ \hline \end{array}$ | $\begin{array}{r} 4 \\ 21 \end{array}$ |  | 44 | $\begin{aligned} & 58 \\ & 38 \\ & \hline \end{aligned}$ | $\begin{array}{r} 23 \\ 2 \end{array}$ | $\begin{aligned} & 37 \\ & 20 \end{aligned}$ |  | 22 | $\begin{aligned} & 34 \\ & 37 \\ & \hline \end{aligned}$ | $\begin{array}{r} 52 \\ 9 \\ \hline \end{array}$ | $\begin{array}{\|l} \mathbf{2 7} \\ 37 \\ \hline \end{array}$ |  | 59 | $\begin{array}{l\|} \hline 18 \\ 36 \end{array}$ | $\begin{array}{\|l} \hline 18 \\ 16 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 19 \\ 14 \\ \hline \end{array}$ | 44 |
| 45 |  | 27 | $\begin{array}{\|l\|} \hline 48 \\ 39 \\ \hline \end{array}$ | $\begin{aligned} & 48 \\ & 44 \end{aligned}$ | $\begin{array}{\|l} \hline 40 \\ 49 \\ \hline \end{array}$ |  | 7 | $\begin{array}{r} 8 \\ 3^{8} \\ \hline \end{array}$ | $\begin{array}{\|l} \mathbf{2 7} \\ 53 \\ \hline \end{array}$ | $\begin{aligned} & 25 \\ & 30 \\ & \hline \end{aligned}$ |  | 45 | $\begin{aligned} & 36 \\ & 38 \\ & \hline \end{aligned}$ | $\begin{array}{\|r} 25 \\ 1 \end{array}$ | $\begin{array}{\|l} 57 \\ 28 \end{array}$ |  | 23 | $\begin{array}{\|l\|} \hline 12 \\ 37 \\ \hline \end{array}$ | $\begin{aligned} & 2 \\ & 8 \end{aligned}$ | $\begin{array}{r} 4 \\ 45 \\ \hline \end{array}$ |  | 59 | $\begin{aligned} & 54 \\ & 36 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 34 \\ 15 \\ \hline \end{array}$ | $33$ | 45 |
| 46 |  | 28 | $\begin{aligned} & \mathbf{2 8} \\ & 39 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 33 \\ 43 \\ \hline \end{array}$ | $\begin{aligned} & 29 \\ & 58 \\ & \hline \end{aligned}$ |  | 7 | $\begin{aligned} & 47 \\ & 38 \\ & \hline \end{aligned}$ | $\begin{aligned} & 20 \\ & 52 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 55 \\ 39 \\ \hline \end{array}$ |  | 46 | $\begin{aligned} & 14 \\ & 38 \\ & \hline \end{aligned}$ | $\begin{array}{r} 27 \\ 0 \end{array}$ | $\begin{aligned} & 25 \\ & 36 \end{aligned}$ |  | 23 | $\begin{aligned} & 49 \\ & 37 \end{aligned}$ | $\begin{array}{r} 10 \\ \hline \\ \hline \end{array}$ | $\begin{aligned} & 49 \\ & 51 \\ & \hline \end{aligned}$ | 49 | 0 | $\begin{aligned} & 30 \\ & 36 \end{aligned}$ | $\begin{aligned} & 49 \\ & 14 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 54 \\ 26 \end{array}$ | 46 |
| 47 |  | 29 | $\begin{array}{\|r\|} \hline 8 \\ 39 \\ \hline \end{array}$ | $\begin{array}{\|l} 17 \\ 43 \end{array}$ | $\begin{array}{r} 27 \\ 7 \\ \hline \end{array}$ |  | 8 | $\begin{aligned} & 26 \\ & 3^{8} \end{aligned}$ | $\left\lvert\, \begin{aligned} & 13 \\ & 51 \end{aligned}\right.$ | $\begin{aligned} & 34 \\ & 46 \end{aligned}$ |  | 46 | $\begin{aligned} & 52 \\ & 37 \end{aligned}$ | $\begin{aligned} & \mathbf{2 8} \\ & 59 \end{aligned}$ | $\begin{array}{r} \mathbf{1} \\ 43 \\ \hline \end{array}$ |  | 24 | $\begin{array}{\|l\|} \hline 26 \\ 37 \end{array}$ | $\begin{array}{r} 18 \\ 6 \end{array}$ | $\begin{aligned} & 40 \\ & 59 \end{aligned}$ |  | 1 | $\begin{array}{r} 7 \\ 36 \end{array}$ | $\begin{array}{r} 4 \\ 13 \end{array}$ | $\begin{aligned} & \hline 20 \\ & 33 \end{aligned}$ | 47 |
| 48 |  | 29 | $\begin{array}{\|l\|} \hline 48 \\ 39 \\ \hline \end{array}$ | $\begin{array}{r} 0 \\ 42 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 34 \\ 17 \\ \hline \end{array}$ |  | 9 | $\begin{array}{r} 5 \\ 3^{8} \end{array}$ | $\begin{array}{\|r\|} \hline 5 \\ 50 \\ \hline \end{array}$ | $\begin{aligned} & 20 \\ & 55 \end{aligned}$ |  | 47 | $\begin{array}{\|l} \hline 30 \\ 37 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{2 7} \\ & 58 \\ & \hline \end{aligned}$ | $\begin{aligned} & 44 \\ & 51 \\ & \hline \end{aligned}$ |  | 25 | $\begin{array}{\|r\|} \hline 3 \\ 37 \\ \hline \end{array}$ | $\begin{array}{r} 25 \\ 6 \end{array}$ | $\begin{array}{r} 39 \\ \hline \\ \hline \end{array}$ |  | 1 | $\begin{array}{l\|} \hline 43 \\ 36 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 17 \\ 12 \\ \hline \end{array}$ | $\begin{array}{\|l} 53 \\ 39 \\ \hline \end{array}$ | 48 |
| 49 |  | 30 | $\begin{array}{l\|} \hline 27 \\ 39 \end{array}$ | $\begin{aligned} & 42 \\ & 41 \end{aligned}$ | $\begin{array}{\|l} \mathbf{5 1} \\ \mathbf{2 5} \\ \hline \end{array}$ |  | 9 | $\begin{aligned} & 43 \\ & 3^{8} \end{aligned}$ | $\begin{aligned} & 56 \\ & 50 \end{aligned}$ | $\begin{array}{\|r\|} \hline 15 \\ 3 \end{array}$ |  | 48 | $\begin{array}{r} 8 \\ 37 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{2 6} \\ & 57 \end{aligned}$ | $\begin{aligned} & \mathbf{3 5} \\ & 59 \end{aligned}$ |  | 25 | $\begin{array}{\|l\|} \hline 4 \mathbf{0} \\ 37 \\ \hline \end{array}$ | $\begin{array}{r} \mathbf{3 1} \\ 5 \end{array}$ | $\begin{array}{\|l\|} 44 \\ 12 \end{array}$ |  | 2 | $\begin{aligned} & 19 \\ & 36 \end{aligned}$ | $\begin{array}{\|l} 30 \\ 11 \end{array}$ | $\begin{array}{\|l} \hline 3^{2} \\ 45 \end{array}$ | 49 |
| 50 | 46 | 31 | $\begin{array}{\|r\|} \hline 7 \\ 39 \\ \hline \end{array}$ | $\begin{aligned} & 24 \\ & 40 \\ & \hline \end{aligned}$ | $\begin{aligned} & \hline 16 \\ & 34 \\ & \hline \end{aligned}$ | 47 | 10 | $\begin{aligned} & 22 \\ & 38 \\ & \hline \end{aligned}$ | $\begin{aligned} & 46 \\ & 49 \\ & \hline \end{aligned}$ | $\begin{aligned} & 18 \\ & 11 \end{aligned}$ | 47 | 48 | $\begin{aligned} & 46 \\ & 37 \end{aligned}$ | $\begin{array}{\|} \mathbf{2 4} \\ 57 \\ \hline \end{array}$ | $\begin{array}{r} 34 \\ 6 \end{array}$ | 48 | 26 | $\begin{array}{\|l\|} \hline \mathbf{1 7} \\ 37 \\ \hline \end{array}$ | $\begin{array}{r} \hline 36 \\ \hline 4 \\ \hline \end{array}$ | $\begin{aligned} & 56 \\ & 19 \end{aligned}$ | 49 | 2 | $\begin{aligned} & 55 \\ & 36 \\ & \hline \end{aligned}$ | $\begin{aligned} & 42 \\ & 10 \end{aligned}$ | $\begin{array}{\|l} \hline \mathbf{1 7} \\ 5^{2} \\ \hline \end{array}$ | 50 |
| 51 |  | 31 | $\begin{aligned} & 47 \\ & 39 \\ & \hline \end{aligned}$ | $\begin{array}{r} 4 \\ 39 \\ \hline \end{array}$ | $\begin{array}{\|l\|l} \hline 50 \\ 43 \\ \hline \end{array}$ |  | 11 | $\begin{array}{r} \mathbf{1} \\ 3^{8} \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 35 \\ 48 \\ \hline \end{array}$ | $\begin{aligned} & 29 \\ & 20 \end{aligned}$ |  | 49 | $\begin{aligned} & \hline 24 \\ & 37 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 21 \\ 56 \\ \hline \end{array}$ | $\begin{aligned} & 40 \\ & 13 \end{aligned}$ |  | 26 | $\begin{aligned} & \mathbf{5 4} \\ & 37 \\ & \hline \end{aligned}$ | $\begin{array}{r} 4 \mathbf{1} \\ 3 \\ \hline \end{array}$ | $\begin{aligned} & 15 \\ & 26 \\ & \hline \end{aligned}$ |  | 3 | $\begin{array}{\|l\|} \hline \mathbf{3 1} \\ 3^{6} \\ \hline \end{array}$ | $\begin{array}{r} 53 \\ \hline 9 \\ \hline \end{array}$ | $\begin{array}{\|r} \hline 9 \\ 57 \\ \hline \end{array}$ | 51 |
| 52 |  | 32 | $\begin{array}{\|l\|} \hline 26 \\ 39 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 44 \\ 38 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 33 \\ 52 \\ \hline \end{array}$ |  | 11 | $\begin{aligned} & 40 \\ & 3^{8} \end{aligned}$ | $\begin{aligned} & 23 \\ & 47 \\ & \hline \end{aligned}$ | $\begin{aligned} & 49 \\ & 28 \end{aligned}$ |  | 50 | $\begin{array}{r} \mathbf{2} \\ 37 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{1 7} \\ & 55 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 53 \\ 21 \end{array}$ |  | 27 | $\begin{aligned} & \mathbf{3 1} \\ & 37 \\ & \hline \end{aligned}$ | $\begin{array}{r} 44 \\ 2 \end{array}$ | $\begin{aligned} & \mathbf{4 1} \\ & 33 \end{aligned}$ |  | 4 | $\begin{array}{\|r\|} \hline 8 \\ 36 \end{array}$ | 3 9 | $\begin{aligned} & 6 \\ & 4 \end{aligned}$ | 52 |
| 53 |  | 33 | $\begin{array}{\|r\|} \hline 6 \\ 39 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 23 \\ 38 \end{array}$ | $\begin{array}{r} 25 \\ 1 \end{array}$ |  | 12 | $\begin{aligned} & 19 \\ & 38 \end{aligned}$ | $\begin{array}{\|l} 11 \\ 46 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{1 7} \\ & 36 \end{aligned}$ |  | 50 | $\begin{aligned} & 40 \\ & 37 \end{aligned}$ | $\begin{array}{\|l} \mathbf{1 3} \\ 54 \\ \hline \end{array}$ | $\begin{array}{\|l} 14 \\ 29 \\ \hline \end{array}$ |  | 28 | $\begin{array}{\|r\|} \hline 8 \\ 37 \\ \hline \end{array}$ | $\begin{array}{r} 47 \\ 1 \end{array}$ | $\begin{array}{\|l\|} \hline 14 \\ 40 \\ \hline \end{array}$ |  | 4 | $\begin{aligned} & 44 \\ & 36 \end{aligned}$ | $\begin{array}{r} 12 \\ 8 \end{array}$ | $\begin{aligned} & \hline 10 \\ & 10 \end{aligned}$ | 53 |
| 54 |  | 33 | $\begin{array}{\|l\|} \hline 46 \\ 39 \end{array}$ | $\begin{array}{\|r} \mathbf{1} \\ 37 \\ \hline \end{array}$ | $\begin{aligned} & 26 \\ & 10 \end{aligned}$ |  | 12 | $\begin{array}{\|l} 57 \\ 38 \\ \hline \end{array}$ | $\begin{array}{\|} 57 \\ 45 \\ \hline \end{array}$ | $\begin{array}{\|l} 53 \\ 44 \end{array}$ |  | 51 | $\begin{aligned} & 18 \\ & 37 \end{aligned}$ | $\begin{array}{\|r} 7 \\ 53 \end{array}$ | $\begin{aligned} & 43 \\ & 36 \end{aligned}$ |  | 28 | $\begin{aligned} & 45 \\ & 37 \end{aligned}$ | $\begin{gathered} 48 \\ 0 \end{gathered}$ | $\begin{array}{\|l} 54 \\ 46 \\ \hline \end{array}$ |  | 5 | $\begin{aligned} & 20 \\ & 36 \end{aligned}$ | $\begin{array}{r} 20 \\ 7 \end{array}$ | $\begin{array}{\|l} \hline 20 \\ 16 \end{array}$ | 54 |
| 55 |  | 34 | $\begin{aligned} & 25 \\ & 39 \end{aligned}$ | $\begin{aligned} & \hline 38 \\ & 3^{6} \\ & \hline \end{aligned}$ | $\begin{aligned} & 36 \\ & 19 \\ & \hline \end{aligned}$ |  | 13 | $\begin{aligned} & 36 \\ & 3^{8} \end{aligned}$ | $\begin{aligned} & 43 \\ & 44 \end{aligned}$ | $\begin{array}{\|l} 37 \\ 53 \end{array}$ |  | 51 | $\begin{aligned} & 56 \\ & 37 \end{aligned}$ | $\begin{array}{\|r} \mathbf{1} \\ 5^{2} \\ \hline \end{array}$ | $\begin{array}{\|l} 19 \\ 44 \\ \hline \end{array}$ |  | 29 | $\begin{aligned} & 22 \\ & 3^{6} \end{aligned}$ | $\begin{aligned} & 49 \\ & 59 \end{aligned}$ | $\begin{aligned} & 40 \\ & 54 \end{aligned}$ |  | 5 | $\begin{aligned} & 56 \\ & 36 \end{aligned}$ | $\begin{array}{r} 27 \\ 6 \end{array}$ | $\begin{aligned} & 36 \\ & 23 \\ & \hline \end{aligned}$ | 55 |
| 56 |  | 35 | $\begin{array}{\|r\|} \hline 5 \\ 39 \\ \hline \end{array}$ | $\begin{array}{\|l} 14 \\ 35 \\ \hline \end{array}$ | $\begin{aligned} & 55 \\ & 28 \\ & \hline \end{aligned}$ |  | 14 | $\begin{array}{\|l} 15 \\ 3^{8} \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 28 \\ 44 \\ \hline \end{array}$ | $\begin{gathered} 30 \\ 1 \end{gathered}$ |  | 52 | $\begin{array}{\|l\|} \hline 33 \\ 37 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{5 4} \\ & 51 \\ & \hline \end{aligned}$ | $\begin{array}{r} 3 \\ 5^{1} \\ \hline \end{array}$ |  | 29 | $\begin{aligned} & 59 \\ & 36 \\ & \hline \end{aligned}$ | $\begin{aligned} & 49 \\ & 59 \\ & \hline \end{aligned}$ | $\begin{array}{r} 34 \\ 0 \end{array}$ |  | 6 | $\begin{array}{\|l\|} \hline 32 \\ 36 \\ \hline \end{array}$ | $\begin{array}{r} 33 \\ \hline \\ \hline \end{array}$ | $\begin{aligned} & 59 \\ & 28 \end{aligned}$ | 56 |
| 57 |  | 35 | $\begin{array}{\|l} 44 \\ 39 \\ \hline \end{array}$ | $\begin{array}{\|l} 50 \\ 34 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 23 \\ 37 \\ \hline \end{array}$ |  | 14 | $\begin{aligned} & 54 \\ & 38 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \mathbf{1 2} \\ 43 \\ \hline \end{array}$ | $\begin{array}{\|r} \mathbf{3 1} \\ 9 \\ \hline \end{array}$ |  | 53 | $\begin{array}{\|l\|} \hline \mathbf{1 1} \\ 37 \\ \hline \end{array}$ | $\begin{array}{\|l} 45 \\ 50 \\ \hline \end{array}$ | $\begin{aligned} & 54 \\ & 59 \end{aligned}$ |  | 30 | $\begin{array}{\|l\|} \hline 36 \\ 36 \\ \hline \end{array}$ | $\begin{aligned} & 48 \\ & 58 \end{aligned}$ | $\begin{array}{\|r\|} \hline 34 \\ \hline \end{array}$ |  | 7 | $\begin{array}{\|r\|} \hline 8 \\ 3^{6} \\ \hline \end{array}$ | $39$ | $\begin{array}{\|l} 27 \\ 35 \\ \hline \end{array}$ | 57 |
| 58 |  | 36 | $\begin{array}{\|} \mathbf{2 4} \\ 39 \\ \hline \end{array}$ | $\begin{aligned} & 25 \\ & 33 \end{aligned}$ | $\begin{array}{r} \mathbf{o} \\ 45 \end{array}$ |  | 15 | $\begin{aligned} & 3^{2} \\ & 3^{8} \end{aligned}$ | $\begin{aligned} & 55 \\ & 42 \end{aligned}$ | $\begin{aligned} & \mathbf{4 0} \\ & \mathbf{1 0} \end{aligned}$ |  | 53 | $\begin{aligned} & 49 \\ & 37 \end{aligned}$ | $\begin{aligned} & 36 \\ & 50 \end{aligned}$ | $\begin{array}{r} 53 \\ 6 \end{array}$ |  | 31 | $\begin{array}{\|l\|} \hline 13 \\ 36 \\ \hline \end{array}$ | $\begin{aligned} & 46 \\ & 57 \end{aligned}$ | $\begin{aligned} & \mathbf{4 1} \\ & \mathbf{1 3} \end{aligned}$ |  | 7 | $\begin{aligned} & 44 \\ & 36 \end{aligned}$ | $44$ | $\begin{array}{r} 2 \\ 41 \\ \hline \end{array}$ | 58 |
| 59 |  | 37 | $\begin{array}{r} 3 \\ 39 \\ \hline \end{array}$ | $\begin{aligned} & 58 \\ & 3^{2} \end{aligned}$ | $\begin{aligned} & 45 \\ & 55 \\ & \hline \end{aligned}$ |  | 16 | $\begin{array}{\|l\|} \mathbf{1 1} \\ 3^{8} \\ \hline \end{array}$ | $\begin{aligned} & 37 \\ & 41 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 57 \\ 25 \end{array}$ |  | 54 | $\begin{array}{\|l\|} \hline 27 \\ 37 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline \mathbf{2 6} \\ 49 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 59 \\ 14 \end{array}$ |  | 31 | $\begin{array}{\|l\|} \hline 50 \\ 36 \\ \hline \end{array}$ | $\begin{aligned} & 43 \\ & 56 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} 54 \\ 21 \end{array}$ |  | 8 | $\begin{aligned} & 20 \\ & 36 \end{aligned}$ | $\begin{array}{r} 47 \\ 2 \end{array}$ | $\begin{array}{\|l} 43 \\ 47 \\ \hline \end{array}$ | 59 |
| 60 | 46 | 37 | $\begin{array}{\|l} 43 \\ 39 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{3 1} \\ & \mathbf{3}^{2} \\ & \hline \end{aligned}$ | $\begin{array}{r} 40 \\ 3 \end{array}$ | 47 | 16 | $\begin{array}{\|l} 50 \\ 38 \\ \hline \end{array}$ | $\begin{aligned} & 19 \\ & 40 \end{aligned}$ | $\begin{array}{\|l} 22 \\ 33 \\ \hline \end{array}$ | 47 | 55 | $\begin{array}{r} 5 \\ 37 \\ \hline \end{array}$ | $\begin{aligned} & 16 \\ & 48 \\ & \hline \end{aligned}$ | $\left\lvert\, \begin{aligned} & 13 \\ & 21 \end{aligned}\right.$ | 48 | 32 | $\begin{array}{l\|} \hline 27 \\ 36 \\ \hline \end{array}$ | $\begin{aligned} & 40 \\ & 55 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 15 \\ 27 \\ \hline \end{array}$ | 49 | 8 | $\begin{aligned} & 56 \\ & 36 \end{aligned}$ | $\begin{gathered} 50 \\ 1 \end{gathered}$ | $\begin{array}{\|l} 30 \\ 53 \\ \hline \end{array}$ | 60 |

Bürgi's 1' sine table (reconstruction, D. Roegel, 2016)

| , | $55^{\circ}$ |  |  |  |  | $56^{\circ}$ |  |  |  |  | $57^{\circ}$ |  |  |  |  | $58^{\circ}$ |  |  |  |  | $59^{\circ}$ |  |  |  |  | , |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 0 | 49 | 8 | $\begin{array}{\|l\|} \hline 56 \\ 36 \end{array}$ | $\begin{gathered} 50 \\ 1 \end{gathered}$ | $\begin{aligned} & 3 \mathbf{3 0} \\ & 53 \end{aligned}$ | 49 | 44 | $\begin{aligned} & 32 \\ & 35 \end{aligned}$ | $\begin{aligned} & \hline 6 \\ & 7 \\ & \hline \end{aligned}$ | $\begin{aligned} & 56 \\ & 40 \end{aligned}$ | 50 | 19 | $\begin{array}{\|l\|} \hline 12 \\ 34 \\ \hline \end{array}$ | $\begin{aligned} & 50 \\ & 12 \end{aligned}$ | $\begin{aligned} & 34 \\ & 46 \end{aligned}$ | 50 | 52 | $\begin{aligned} & 58 \\ & 33 \end{aligned}$ | $\begin{array}{\|l} 23 \\ 17 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 20 \\ 17 \end{array}$ | 51 | 25 | $\begin{aligned} & 48 \\ & 3^{2} \end{aligned}$ | $\begin{array}{\|r} 8 \\ 21 \end{array}$ | $13$ | 0 |
| 1 |  | 9 | $\begin{aligned} & \hline \mathbf{3 2} \\ & 36 \\ & \hline \end{aligned}$ | $\begin{gathered} 5^{2} \\ 0 \end{gathered}$ | $\begin{array}{\|l\|} \hline 23 \\ 59 \\ \hline \end{array}$ |  | 45 | $\begin{array}{r} 7 \\ 35 \\ \hline \end{array}$ | $\begin{array}{r} 14 \\ \hline \end{array}$ | $\begin{aligned} & 36 \\ & 44 \\ & \hline \end{aligned}$ |  | 19 | $\begin{aligned} & 47 \\ & 34 \\ & \hline \end{aligned}$ | $\begin{array}{r} 3 \\ 11 \\ \hline \end{array}$ | $\begin{aligned} & 20 \\ & 52 \\ & \hline \end{aligned}$ |  | 53 | $\begin{aligned} & \mathbf{3 1} \\ & 33 \\ & \hline \end{aligned}$ | $\begin{aligned} & 40 \\ & 16 \end{aligned}$ | $\begin{aligned} & 37 \\ & 21 \end{aligned}$ |  | 26 | $\begin{aligned} & 20 \\ & 32 \end{aligned}$ | $\begin{aligned} & 29 \\ & 20 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 24 \\ 14 \\ \hline \end{array}$ | 1 |
| 2 |  | 10 | $\begin{array}{\|r\|} \hline 8 \\ 3^{6} \\ \hline \end{array}$ | $\begin{gathered} 53 \\ 0 \end{gathered}$ | $\begin{array}{r} 22 \\ 5 \\ \hline \end{array}$ |  | 45 | $\begin{aligned} & 42 \\ & 35 \\ & \hline \end{aligned}$ | $\begin{array}{r} 21 \\ 5 \end{array}$ | $\begin{aligned} & 20 \\ & 50 \\ & \hline \end{aligned}$ |  | 20 | $\begin{array}{\|l\|} \mathbf{2 1} \\ 34 \\ \hline \end{array}$ | $\left\lvert\, \begin{aligned} & 15 \\ & 10 \end{aligned}\right.$ | $\begin{aligned} & \mathbf{1 2} \\ & 57 \\ & \hline \end{aligned}$ |  | 54 | $\begin{array}{r} 4 \\ 33 \\ \hline \end{array}$ | $\begin{aligned} & 56 \\ & 15 \end{aligned}$ | $\begin{aligned} & 58 \\ & 25 \\ & \hline \end{aligned}$ |  | 26 | $\begin{aligned} & 52 \\ & 32 \end{aligned}$ | $\begin{aligned} & 49 \\ & 19 \end{aligned}$ | $\begin{aligned} & 38 \\ & 18 \end{aligned}$ | 2 |
| 3 |  | 10 | $\begin{aligned} & 44 \\ & 35 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 53 \\ 59 \\ \hline \end{array}$ | $\begin{aligned} & 27 \\ & 11 \end{aligned}$ |  | 46 | $\begin{aligned} & \mathbf{1 7} \\ & 35 \end{aligned}$ | $\begin{array}{r} 27 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{1 0} \\ & 56 \\ & \hline \end{aligned}$ |  | 20 | $\begin{array}{\|} 55 \\ 34 \\ \hline \end{array}$ | $\begin{aligned} & 26 \\ & 10 \\ & \hline \end{aligned}$ | $\begin{aligned} & 9 \\ & 1 \end{aligned}$ |  | 54 | $\begin{aligned} & 38 \\ & 33 \end{aligned}$ | $\begin{aligned} & 12 \\ & 14 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 23 \\ 30 \\ \hline \end{array}$ |  | 27 | $\begin{aligned} & 25 \\ & 3^{2} \\ & \hline \end{aligned}$ | $\begin{array}{r} 8 \\ 18 \\ \hline \end{array}$ | $\begin{gathered} 56 \\ 21 \end{gathered}$ | 3 |
| 4 |  | 11 | $\begin{array}{l\|} \hline 20 \\ 35 \\ \hline \end{array}$ | $\begin{aligned} & 52 \\ & 58 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 38 \\ 17 \\ \hline \end{array}$ |  | 46 | $\begin{aligned} & 52 \\ & 35 \\ & \hline \end{aligned}$ | $\begin{array}{r} 32 \\ 4 \\ \hline \end{array}$ | $6$ |  | 21 | $\begin{array}{r} 29 \\ 34 \\ \hline \end{array}$ | $\begin{array}{r} 36 \\ 9 \end{array}$ | $\begin{array}{r} 10 \\ 6 \end{array}$ |  | 55 | $\begin{aligned} & \mathbf{1 1} \\ & 33 \end{aligned}$ | $\begin{aligned} & 26 \\ & 13 \end{aligned}$ | $\begin{array}{\|l} 53 \\ 33 \\ \hline \end{array}$ |  | 27 | $\begin{aligned} & 57 \\ & 32 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 27 \\ 17 \\ \hline \end{array}$ | $\begin{array}{\|l} \mathbf{1 7} \\ \mathbf{2 5} \\ \hline \end{array}$ | 4 |
| 5 |  | 11 | $\begin{array}{\|l\|} \hline 56 \\ 35 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{5 0} \\ & 57 \\ & \hline \end{aligned}$ | $\begin{aligned} & 55 \\ & 24 \\ & \hline \end{aligned}$ |  | 47 | $\begin{aligned} & \mathbf{2 7} \\ & 35 \end{aligned}$ | $\begin{array}{r} 36 \\ \hline \end{array}$ | $\begin{aligned} & 7 \\ & 6 \end{aligned}$ |  | 22 | $\begin{array}{r} 3 \\ 34 \\ \hline \end{array}$ | $\begin{array}{r} 45 \\ 8 \end{array}$ | $\begin{aligned} & \hline 16 \\ & 11 \end{aligned}$ |  | 55 | $\begin{aligned} & 44 \\ & 33 \\ & \hline \end{aligned}$ | $\begin{aligned} & 40 \\ & 12 \end{aligned}$ | $\begin{aligned} & 26 \\ & 38 \\ & \hline \end{aligned}$ |  | 28 | $\begin{aligned} & 29 \\ & 32 \end{aligned}$ | $\begin{aligned} & 44 \\ & 16 \end{aligned}$ | $\begin{array}{\|l} \hline 42 \\ 29 \\ \hline \end{array}$ | 5 |
| 6 |  | 12 | $\begin{aligned} & \mathbf{3 2}^{2} \\ & 35 \\ & \hline \end{aligned}$ | $\begin{aligned} & 48 \\ & 56 \end{aligned}$ | $\begin{aligned} & 19 \\ & 29 \end{aligned}$ |  | 48 | $\begin{array}{r} 2 \\ 35 \\ \hline \end{array}$ | $\begin{array}{r} 39 \\ 2 \end{array}$ | $\begin{array}{\|l\|} \hline 13 \\ 12 \end{array}$ |  | 22 | $\begin{array}{\|l} 37 \\ 34 \\ \hline \end{array}$ | $\begin{array}{r} 53 \\ 7 \end{array}$ | $\begin{aligned} & 27 \\ & 15 \end{aligned}$ |  | 56 | $\begin{array}{\|l} \mathbf{1 7} \\ \mathbf{3 3} \end{array}$ | $\begin{array}{\|l} 53 \\ 11 \end{array}$ | $\begin{array}{r} 4 \\ 4^{2} \\ \hline \end{array}$ |  | 29 | $\begin{array}{r} 2 \\ 3^{2} \end{array}$ | $\begin{array}{\|r} \mathbf{1} \\ \mathbf{1 5} \\ \hline \end{array}$ | $\begin{array}{\|l\|} \mathbf{1 1} \\ 32 \\ \hline \end{array}$ | 6 |
| 7 |  | 13 | $\begin{array}{\|r\|} \hline 8 \\ 35 \\ \hline \end{array}$ | $\begin{aligned} & 44 \\ & 55 \\ & \hline \end{aligned}$ | $\begin{aligned} & 48 \\ & 35 \\ & \hline \end{aligned}$ |  | 48 | $\begin{aligned} & 37 \\ & 35 \\ & \hline \end{aligned}$ | $\begin{array}{r} 4 \mathbf{1} \\ 1 \end{array}$ | $\begin{array}{\|l} 25 \\ 17 \end{array}$ |  | 23 | $\begin{aligned} & 12 \\ & 34 \\ & \hline \end{aligned}$ | $\begin{aligned} & \mathrm{o} \\ & 6 \end{aligned}$ | $\begin{aligned} & 42 \\ & 20 \end{aligned}$ |  | 56 | $\begin{array}{\|l} \mathbf{5 1} \\ 33 \end{array}$ | $\begin{array}{r} 4 \\ 10 \end{array}$ | $\begin{aligned} & 46 \\ & 46 \end{aligned}$ |  | 29 | $\begin{aligned} & 34 \\ & 3^{2} \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 16 \\ 14 \\ \hline \end{array}$ | $\begin{aligned} & 43 \\ & 35 \\ & \hline \end{aligned}$ | 7 |
| 8 |  | 13 | $\begin{aligned} & 44 \\ & 35 \\ & \hline \end{aligned}$ | $\begin{aligned} & 40 \\ & 54 \end{aligned}$ | $\begin{array}{\|l\|} \hline 23 \\ 42 \\ \hline \end{array}$ |  | 49 | $\begin{aligned} & 12 \\ & 35 \end{aligned}$ | $\begin{gathered} 42 \\ 0 \end{gathered}$ | $\begin{array}{\|l} 42 \\ 22 \end{array}$ |  | 23 | $\begin{aligned} & 46 \\ & 34 \\ & \hline \end{aligned}$ | $\begin{aligned} & 7 \\ & 5 \\ & \hline \end{aligned}$ | $\begin{array}{r} 2 \\ 26 \\ \hline \end{array}$ |  | 57 | $\begin{array}{\|l} 24 \\ 33 \\ \hline \end{array}$ | $\begin{array}{\|r} 15 \\ \hline \end{array}$ | $\begin{aligned} & 3^{2} \\ & 5^{1} \\ & \hline \end{aligned}$ |  | 30 | $\begin{array}{r} 6 \\ 3^{2} \end{array}$ | $\begin{array}{\|l\|} \hline 31 \\ 13 \\ \hline \end{array}$ | $\begin{aligned} & \hline \mathbf{1 8} \\ & 39 \\ & \hline \end{aligned}$ | 8 |
| 9 |  | 14 | $\begin{aligned} & 20 \\ & 35 \\ & \hline \end{aligned}$ | $\begin{aligned} & 35 \\ & 53 \end{aligned}$ | $\begin{array}{r} 5 \\ 47 \\ \hline \end{array}$ |  | 49 | $\begin{aligned} & 47 \\ & 34 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 43 \\ 59 \end{array}$ | $\begin{array}{r} 4 \\ 28 \end{array}$ |  | 24 | $\begin{array}{\|l} 20 \\ 34 \end{array}$ | $\begin{array}{r} 12 \\ 4 \\ \hline \end{array}$ | $\begin{aligned} & 28 \\ & 29 \\ & \hline \end{aligned}$ |  | 57 | $\begin{aligned} & 57 \\ & 33 \\ & \hline \end{aligned}$ | $\begin{array}{r} 25 \\ 8 \end{array}$ | $\begin{array}{\|l} 23 \\ 54 \\ \hline \end{array}$ |  | 30 | $\begin{aligned} & 3^{8} \\ & 3^{2} \end{aligned}$ | $\begin{array}{\|l} 44 \\ 12 \end{array}$ | $\begin{array}{\|l} 57 \\ 43 \\ \hline \end{array}$ | 9 |
| 10 | 49 | 14 | $\begin{array}{\|l\|} \hline 56 \\ 35 \\ \hline \end{array}$ | $\begin{aligned} & 28 \\ & 52 \end{aligned}$ | $\begin{array}{\|} \mathbf{5 2} \\ 54 \\ \hline \end{array}$ | 49 | 50 | $\begin{aligned} & 22 \\ & 34 \end{aligned}$ | $\begin{aligned} & 42 \\ & 58 \\ & \hline \end{aligned}$ | $\begin{aligned} & 32 \\ & 33 \end{aligned}$ | 50 | 24 | $\begin{array}{r} 54 \\ 34 \\ \hline \end{array}$ | $\begin{array}{r} 16 \\ 3 \end{array}$ | $\begin{aligned} & 57 \\ & 35 \\ & \hline \end{aligned}$ | 50 | 58 | $\begin{aligned} & 30 \\ & 33 \end{aligned}$ | $\begin{array}{r} 34 \\ \hline \end{array}$ | $\begin{array}{\|l} \mathbf{1 7} \\ \mathbf{5 9} \\ \hline \end{array}$ | $5^{1}$ | 31 | $\begin{aligned} & 10 \\ & 32 \end{aligned}$ | $57$ | $\begin{aligned} & 40 \\ & 46 \end{aligned}$ | 10 |
| 11 |  | 15 | $\begin{aligned} & \mathbf{3 2}^{2} \\ & 35 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 21 \\ 51 \\ \hline \end{array}$ | $\begin{aligned} & 46 \\ & 59 \\ & \hline \end{aligned}$ |  | 50 | $\begin{aligned} & 57 \\ & 34 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \mathbf{4 1} \\ 57 \\ \hline \end{array}$ | $\begin{array}{r} 5 \\ 3^{8} \\ \hline \end{array}$ |  | 25 | $\begin{aligned} & 28 \\ & 34 \\ & \hline \end{aligned}$ | $\begin{array}{r} 20 \\ 2 \end{array}$ | $\begin{aligned} & \mathbf{3 2} \\ & 39 \\ & \hline \end{aligned}$ |  | 59 | $\begin{array}{r} 3 \\ 33 \\ \hline \end{array}$ | $\begin{array}{r} 42 \\ 7 \\ \hline \end{array}$ | $\begin{array}{r} 16 \\ 2 \end{array}$ |  | 31 | $\begin{array}{\|l} 43 \\ 3^{2} \\ \hline \end{array}$ | $\begin{array}{r} 9 \\ 10 \\ \hline \end{array}$ | $\begin{aligned} & 26 \\ & 50 \end{aligned}$ | 11 |
| 12 |  | 16 | $\begin{array}{\|r\|} \hline 8 \\ 35 \\ \hline \end{array}$ | $\begin{aligned} & 13 \\ & 51 \\ & \hline \end{aligned}$ | $\begin{array}{r} 45 \\ 5 \\ \hline \end{array}$ |  | 51 | $\begin{aligned} & \mathbf{3 2} \\ & 34 \end{aligned}$ | $\begin{aligned} & 38 \\ & 56 \\ & \hline \end{aligned}$ | $\begin{aligned} & 43 \\ & 44 \\ & \hline \end{aligned}$ |  | 26 | $\begin{array}{r} \mathbf{2} \\ 34 \\ \hline \end{array}$ | $\begin{array}{r} 23 \\ 1 \end{array}$ | $\begin{array}{\|l\|} \hline \mathbf{1 1} \\ 44 \\ \hline \end{array}$ |  | 59 | $\begin{aligned} & \mathbf{3 6} \\ & 33 \end{aligned}$ | $\begin{array}{r} 49 \\ 6 \end{array}$ | $\begin{array}{r} \hline 18 \\ 7 \\ \hline \end{array}$ |  | 32 | $\begin{aligned} & 15 \\ & 3^{2} \end{aligned}$ | $\begin{array}{r} 20 \\ \hline 9 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 16 \\ 53 \\ \hline \end{array}$ | 12 |
| 13 |  | 16 | $\begin{aligned} & 44 \\ & 35 \\ & \hline \end{aligned}$ | $\begin{array}{r} 4 \\ 50 \\ \hline \end{array}$ | $\begin{aligned} & 50 \\ & 12 \end{aligned}$ |  | 52 | $\begin{array}{r} 7 \\ 34 \\ \hline \end{array}$ | $\begin{aligned} & 35 \\ & 55 \end{aligned}$ | $\begin{aligned} & 27 \\ & 49 \\ & \hline \end{aligned}$ |  | 26 | $\begin{aligned} & \hline 36 \\ & 34 \\ & \hline \end{aligned}$ | $\begin{array}{r} 24 \\ 0 \end{array}$ | $\begin{array}{\|l} \hline 55 \\ 48 \\ \hline \end{array}$ | 51 | 0 | $\begin{array}{r} 9 \\ 33 \\ \hline \end{array}$ | $\begin{array}{r} 55 \\ 5 \\ \hline \end{array}$ | $\begin{aligned} & 25 \\ & 10 \end{aligned}$ |  | 32 | $\begin{aligned} & 47 \\ & 3^{2} \end{aligned}$ | $\begin{array}{r} 30 \\ \hline 8 \\ \hline \end{array}$ | $\begin{array}{\|r} 9 \\ 57 \\ \hline \end{array}$ | 13 |
| 14 |  | 17 | $\begin{aligned} & 19 \\ & 35 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 55 \\ 49 \\ \hline \end{array}$ | $\begin{array}{\|r} \hline 2 \\ 17 \\ \hline \end{array}$ |  | 52 | $\begin{aligned} & 42 \\ & 34 \end{aligned}$ | $\begin{aligned} & \mathbf{3 1}_{1} \\ & 54 \\ & \hline \end{aligned}$ | $\begin{aligned} & \mathbf{1 6} \\ & 55 \end{aligned}$ |  | 27 | $\begin{aligned} & 10 \\ & 33 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 25 \\ 59 \\ \hline \end{array}$ | $\begin{aligned} & 43 \\ & 53 \end{aligned}$ |  | 0 | $\begin{aligned} & 43 \\ & 33 \\ & \hline \end{aligned}$ | $\begin{aligned} & \hline \mathbf{o} \\ & 4 \\ & \hline \end{aligned}$ | $\begin{aligned} & 35 \\ & 15 \\ & \hline \end{aligned}$ |  | 33 | $\begin{aligned} & 19 \\ & 3^{2} \\ & \hline \end{aligned}$ | $\begin{array}{r} 39 \\ \hline \end{array}$ | $\begin{aligned} & 6 \\ & 0 \end{aligned}$ | 14 |
| 15 |  | 17 | $\begin{aligned} & 55 \\ & 35 \\ & \hline \end{aligned}$ | $\begin{array}{\|} 44 \\ 48 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 19 \\ 23 \\ \hline \end{array}$ |  | 53 | $\begin{aligned} & \hline \mathbf{1 7} \\ & 34 \end{aligned}$ | $\begin{aligned} & \mathbf{2 6} \\ & 53 \end{aligned}$ | $\begin{array}{\|l\|} \hline \mathbf{1 1} \\ 59 \\ \hline \end{array}$ |  | 27 | $\begin{array}{\|} 44 \\ 33 \\ \hline \end{array}$ | $\begin{aligned} & 25 \\ & 58 \\ & \hline \end{aligned}$ | $\begin{aligned} & 36 \\ & 58 \\ & \hline \end{aligned}$ |  | 1 | $\begin{aligned} & 16 \\ & 33 \end{aligned}$ | $\begin{aligned} & 4 \\ & 3 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 50 \\ 19 \\ \hline \end{array}$ |  | 33 | $\begin{array}{\|l} \mathbf{5}^{1} \\ 3^{2} \\ \hline \end{array}$ | $\begin{array}{r} 47 \\ \hline \end{array}$ | $\begin{aligned} & \hline 6 \\ & 3 \\ & \hline \end{aligned}$ | 15 |
| 16 |  | 18 | $\begin{aligned} & \mathbf{3 1} \\ & 35 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \mathbf{3 2} \\ 47 \\ \hline \end{array}$ | $\begin{aligned} & 42 \\ & 29 \\ & \hline \end{aligned}$ |  | 53 | $\begin{aligned} & 5 \mathbf{5} \\ & 34 \end{aligned}$ | $\begin{aligned} & 20 \\ & 53 \end{aligned}$ | $\begin{array}{r} 10 \\ 5 \end{array}$ |  | 28 | $\begin{aligned} & 18 \\ & 33 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 24 \\ 58 \\ \hline \end{array}$ | $\begin{array}{r} 34 \\ 3 \end{array}$ |  | 1 | $\begin{aligned} & 49 \\ & 33 \\ & \hline \end{aligned}$ | $\begin{aligned} & 8 \\ & 2 \end{aligned}$ | $\begin{array}{r} 9 \\ 23 \\ \hline \end{array}$ |  | 34 | $\begin{aligned} & 23 \\ & 3^{2} \\ & \hline \end{aligned}$ | $\begin{array}{r} 54 \\ 6 \end{array}$ | $\begin{aligned} & 9 \\ & 7 \\ & \hline \end{aligned}$ | 16 |
| 17 |  | 19 | $\begin{array}{\|r\|} \hline 7 \\ 35 \\ \hline \end{array}$ | $\begin{aligned} & 20 \\ & 46 \end{aligned}$ | $\begin{aligned} & \hline 11 \\ & 35 \end{aligned}$ |  | 54 | $\begin{aligned} & 27 \\ & 34 \end{aligned}$ | $\begin{aligned} & 13 \\ & 5^{2} \\ & \hline \end{aligned}$ | $\begin{aligned} & 15 \\ & 10 \end{aligned}$ |  | 28 | $\begin{aligned} & \mathbf{5 2} \\ & 33 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \mathbf{2 2} \\ 57 \\ \hline \end{array}$ | $\begin{array}{\|r} \hline 37 \\ \hline \end{array}$ |  | 2 | $\begin{aligned} & 22 \\ & 33 \end{aligned}$ | $\begin{array}{\|r} 10 \\ 1 \end{array}$ | $\begin{aligned} & 32 \\ & 27 \\ & \hline \end{aligned}$ |  | 34 | $\begin{aligned} & 56 \\ & 3^{2} \end{aligned}$ | $\begin{aligned} & \hline 0 \\ & 5 \\ & \hline \end{aligned}$ | $\begin{aligned} & \hline 16 \\ & 10 \end{aligned}$ | 17 |
| 18 |  | 19 | $\begin{aligned} & 43 \\ & 35 \end{aligned}$ | $\begin{array}{r} 6 \\ 45 \end{array}$ | $\begin{aligned} & 46 \\ & 41 \end{aligned}$ |  | 55 | $\begin{array}{r} 2 \\ 34 \\ \hline \end{array}$ | $\begin{array}{r} 5 \\ 51 \end{array}$ | $\begin{aligned} & 25 \\ & 16 \end{aligned}$ |  | 29 | $\begin{aligned} & 26 \\ & 33 \end{aligned}$ | $\begin{aligned} & 19 \\ & 56 \end{aligned}$ | $\begin{aligned} & 44 \\ & 12 \end{aligned}$ |  | 2 | $\begin{array}{\|l} 55 \\ 33 \end{array}$ | $\begin{array}{r} \mathbf{1 1} \\ 0 \end{array}$ | $\begin{array}{\|l} 59 \\ 31 \\ \hline \end{array}$ |  | 35 | $\begin{aligned} & 28 \\ & 32 \end{aligned}$ | $\begin{aligned} & 5 \\ & 4 \end{aligned}$ | $\begin{array}{\|l\|} \hline 26 \\ 14 \end{array}$ | 18 |
| 19 |  | 20 | $\begin{array}{\|l\|} \hline \mathbf{1 8} \\ \mathbf{3 5} \\ \hline \end{array}$ | $\begin{array}{\|l} \mathbf{5}^{2} \\ 44 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 27 \\ 47 \\ \hline \end{array}$ |  | 55 | $\begin{aligned} & 36 \\ & 34 \\ & \hline \end{aligned}$ | $\begin{aligned} & 56 \\ & 50 \\ & \hline \end{aligned}$ | $\begin{aligned} & \mathbf{4 1} \\ & \mathbf{2 1} \end{aligned}$ |  | 30 | $\begin{array}{r} \mathbf{o} \\ 33 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 15 \\ 55 \\ \hline \end{array}$ | $\begin{aligned} & 56 \\ & 16 \\ & \hline \end{aligned}$ |  | 3 | $\begin{aligned} & 28 \\ & 32 \end{aligned}$ | $\begin{aligned} & 12 \\ & 59 \\ & \hline \end{aligned}$ | $\begin{aligned} & 30 \\ & 34 \\ & \hline \end{aligned}$ |  | 36 | $\begin{array}{r} \mathbf{0} \\ 3^{2} \\ \hline \end{array}$ | 9 3 | $\begin{array}{\|l} \hline \mathbf{4 0} \\ 17 \\ \hline \end{array}$ | 19 |
| 20 | 49 | 20 | $\begin{array}{\|l\|} \hline 54 \\ 35 \\ \hline \end{array}$ | $\begin{array}{\|l} 37 \\ 43 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 14 \\ 53 \\ \hline \end{array}$ | 49 | 56 | $\begin{aligned} & \hline \mathbf{1 1} \\ & 34 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 47 \\ 49 \\ \hline \end{array}$ | $\begin{array}{r} 2 \\ 26 \\ \hline \end{array}$ | 50 | 30 | $\begin{aligned} & 34 \\ & 33 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \mathbf{1 1} \\ 54 \\ \hline \end{array}$ | $\begin{aligned} & \hline 12 \\ & 21 \end{aligned}$ | 51 | 4 | $\begin{array}{\|r} 1 \\ 3^{2} \\ \hline \end{array}$ | $\begin{aligned} & 12 \\ & 58 \end{aligned}$ | $\begin{array}{r} 4 \\ 39 \end{array}$ | $5^{1}$ | 36 | $\begin{aligned} & 3^{2} \\ & 3^{2} \end{aligned}$ | $\begin{array}{r} 12 \\ 2 \end{array}$ | $\begin{array}{\|l} \hline 57 \\ 21 \end{array}$ | 20 |
| 21 |  | 21 | $\begin{aligned} & 30 \\ & 35 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 21 \\ 42 \\ \hline \end{array}$ | $\begin{array}{r} 7 \\ 58 \\ \hline \end{array}$ |  | 56 | $\begin{aligned} & 46 \\ & 34 \end{aligned}$ | $\begin{aligned} & 36 \\ & 48 \end{aligned}$ | $\begin{aligned} & 28 \\ & 31 \end{aligned}$ |  | 31 | $\begin{array}{r} 8 \\ 33 \\ \hline \end{array}$ | $\begin{array}{r} 5 \\ 53 \\ \hline \end{array}$ | $\begin{aligned} & 33 \\ & 26 \end{aligned}$ |  | 4 | $\begin{aligned} & 34 \\ & 3^{2} \\ & \hline \end{aligned}$ | $\begin{aligned} & \mathbf{1 0} \\ & 57 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 43 \\ 43 \\ \hline \end{array}$ |  | 37 | $\begin{array}{r} 4 \\ 3^{2} \end{array}$ | $15$ | $\begin{array}{\|l\|} \hline 18 \\ 24 \\ \hline \end{array}$ | 21 |
| 22 |  | 22 | $\begin{array}{\|r\|} \hline 6 \\ 35 \\ \hline \end{array}$ | $\begin{array}{r} 4 \\ 42 \\ \hline \end{array}$ | $\begin{aligned} & 5 \\ & 5 \\ & \hline \end{aligned}$ |  | 57 | $\begin{aligned} & 21 \\ & 34 \\ & \hline \end{aligned}$ | $\begin{aligned} & \mathbf{2 4} \\ & 47 \end{aligned}$ | $\begin{aligned} & 59 \\ & 36 \end{aligned}$ |  | $3^{1}$ | $\begin{aligned} & \mathbf{4 1} \\ & 33 \end{aligned}$ | $\begin{aligned} & 58 \\ & 52 \end{aligned}$ | $\begin{aligned} & 59 \\ & 30 \end{aligned}$ |  | 5 | $\begin{array}{r} 7 \\ 3^{2} \end{array}$ | $\begin{array}{r} 8 \\ 56 \end{array}$ | $\begin{aligned} & \mathbf{2 6} \\ & 47 \end{aligned}$ |  | 37 | $\begin{aligned} & 3^{6} \\ & 3^{2} \end{aligned}$ | $\begin{array}{r} 16 \\ 0 \end{array}$ | $\begin{array}{\|l} \hline 42 \\ 27 \end{array}$ | 22 |
| 23 |  | 22 | $\begin{aligned} & \mathbf{4 1} \\ & \mathbf{3 5} \end{aligned}$ | $\begin{aligned} & 4^{6} \\ & 4^{1} \\ & \hline \end{aligned}$ | $\begin{aligned} & 10 \\ & 10 \end{aligned}$ |  | 57 | $\begin{aligned} & 56 \\ & 34 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} 12 \\ 46 \\ \hline \end{array}$ | $\begin{aligned} & 35 \\ & 42 \end{aligned}$ |  | 32 | $\begin{array}{\|l} 15 \\ 33 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{5 1} \\ & 51 \\ & \hline \end{aligned}$ | $\begin{aligned} & 29 \\ & 35 \\ & \hline \end{aligned}$ |  | 5 | $\begin{aligned} & 40 \\ & 3^{2} \end{aligned}$ | $\begin{array}{r} 5 \\ 55 \\ \hline \end{array}$ | $\begin{array}{\|l} 13 \\ 51 \\ \hline \end{array}$ |  | 38 | $\begin{array}{r} 8 \\ 3^{1} \end{array}$ | $\begin{array}{\|l} \hline 17 \\ 59 \\ \hline \end{array}$ | $\begin{array}{r} 9 \\ 3^{1} \end{array}$ | 23 |
| 24 |  | 23 | $\begin{aligned} & \mathbf{1 7} \\ & \mathbf{3 5} \\ & \hline \end{aligned}$ | $\begin{aligned} & 27 \\ & 40 \\ & \hline \end{aligned}$ | $\begin{aligned} & \hline 20 \\ & 16 \\ & \hline \end{aligned}$ |  | 58 | $\begin{aligned} & \mathbf{3 0} \\ & 34 \end{aligned}$ | $\begin{aligned} & 59 \\ & 45 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \mathbf{1 7} \\ \mathbf{4 7} \\ \hline \end{array}$ |  | 32 | $\begin{aligned} & 49 \\ & 33 \\ & \hline \end{aligned}$ | $\begin{aligned} & 43 \\ & 50 \\ & \hline \end{aligned}$ | $\begin{array}{r} 4 \\ 39 \\ \hline \end{array}$ |  | 6 | $\begin{aligned} & 13 \\ & 3^{2} \\ & \hline \end{aligned}$ | $\begin{array}{\|r} \mathbf{1} \\ 54 \\ \hline \end{array}$ | $\begin{array}{r} 4 \\ 55 \\ \hline \end{array}$ |  | 38 | $\begin{aligned} & 4^{0} \\ & 3^{1} \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline \mathbf{1 6} \\ 58 \\ \hline \end{array}$ | $\begin{aligned} & 40 \\ & 34 \\ & \hline \end{aligned}$ | 24 |
| 25 |  | 23 | $\begin{aligned} & \hline 53 \\ & 35 \\ & \hline \end{aligned}$ | $\begin{array}{r} 7 \\ 39 \\ \hline \end{array}$ | $\begin{aligned} & 36 \\ & 22 \end{aligned}$ |  | 59 | $\begin{array}{r} \mathbf{5} \\ 34 \\ \hline \end{array}$ | $\begin{array}{\|} 45 \\ 44 \\ \hline \end{array}$ | $\begin{array}{r} 4 \\ 5^{2} \end{array}$ |  | 33 | $\begin{aligned} & 23 \\ & 33 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 33 \\ 49 \\ \hline \end{array}$ | $\begin{aligned} & 43 \\ & 44 \\ & \hline \end{aligned}$ |  | 6 | $\begin{aligned} & 45 \\ & 3^{2} \end{aligned}$ | $\begin{array}{\|l} 55 \\ 53 \\ \hline \end{array}$ | $\begin{aligned} & 59 \\ & 59 \end{aligned}$ |  | 39 | $\begin{aligned} & 12 \\ & 31 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline \mathbf{1 5} \\ 57 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 14 \\ 38 \\ \hline \end{array}$ | 25 |
| 26 |  | 24 | $\begin{array}{\|l\|} \hline 28 \\ 35 \\ \hline \end{array}$ | $\begin{aligned} & 46 \\ & 38 \\ & \hline \end{aligned}$ | $\begin{aligned} & 58 \\ & 28 \end{aligned}$ |  | 59 | $\begin{aligned} & 40 \\ & 34 \\ & \hline \end{aligned}$ | $\begin{array}{\|} 29 \\ 43 \\ \hline \end{array}$ | $\begin{aligned} & 56 \\ & 57 \\ & \hline \end{aligned}$ |  | 33 | $\begin{array}{\|l} 57 \\ 33 \end{array}$ | $\begin{array}{\|l} 23 \\ 48 \\ \hline \end{array}$ | $\begin{array}{\|l} \mathbf{2 7} \\ 49 \\ \hline \end{array}$ |  | 7 | $\begin{aligned} & 18 \\ & 3^{2} \end{aligned}$ | $\begin{aligned} & 49 \\ & 53 \\ & \hline \end{aligned}$ | $\begin{array}{r} 58 \\ 2 \end{array}$ |  | 39 | $\begin{aligned} & 44 \\ & 3^{1} \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 12 \\ 56 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 52 \\ 4^{1} \\ \hline \end{array}$ | 26 |
| 27 |  | 25 | $\begin{array}{\|r\|} \hline 4 \\ 35 \\ \hline \end{array}$ | $\begin{array}{\|l} 25 \\ 37 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 26 \\ 34 \\ \hline \end{array}$ | 50 | 0 | $\begin{aligned} & 15 \\ & 34 \\ & \hline \end{aligned}$ | $\begin{aligned} & 13 \\ & 43 \\ & \hline \end{aligned}$ | $\begin{array}{r} 53 \\ 2 \end{array}$ |  | 34 | $\begin{array}{\|l} \mathbf{3 1} \\ 33 \\ \hline \end{array}$ | $\begin{array}{\|l} 12 \\ 47 \\ \hline \end{array}$ | $\begin{aligned} & \hline 16 \\ & 53 \\ & \hline \end{aligned}$ |  | 7 | $\begin{array}{\|l} 51 \\ 3^{2} \\ \hline \end{array}$ | $\begin{array}{\|l} 43 \\ 52 \\ \hline \end{array}$ | 0 7 |  | 40 | $\begin{aligned} & 16 \\ & 3^{1} \\ & \hline \end{aligned}$ | $\begin{array}{r} 9 \\ 55 \\ \hline \end{array}$ | $\begin{array}{\|l} 33 \\ 44 \\ \hline \end{array}$ | 27 |
| 28 |  | 25 | $\begin{array}{\|l\|} \hline 40 \\ 35 \\ \hline \end{array}$ | $\begin{array}{r} 3 \\ 3^{6} \\ \hline \end{array}$ | $\begin{array}{\|r} \hline \mathbf{o} \\ 39 \\ \hline \end{array}$ |  | 0 | $\begin{aligned} & 49 \\ & 34 \end{aligned}$ | $\begin{aligned} & 5^{6} \\ & 4^{2} \end{aligned}$ | $\begin{array}{r} 55 \\ 8 \end{array}$ |  | 35 | $\begin{array}{r} 5 \\ 33 \\ \hline \end{array}$ | $\begin{array}{r} \hline \mathbf{o} \\ 46 \\ \hline \end{array}$ | $\begin{array}{r} 9 \\ 57 \\ \hline \end{array}$ |  | 8 | $\begin{aligned} & 24 \\ & 3^{2} \end{aligned}$ | $\begin{aligned} & 35 \\ & 51 \\ & \hline \end{aligned}$ | $\begin{array}{r} 7 \\ 10 \end{array}$ |  | 40 | $\begin{aligned} & 4^{8} \\ & 3^{1} \end{aligned}$ | $\begin{array}{r} 5 \\ 54 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline \mathbf{1 7} \\ 47 \\ \hline \end{array}$ | 28 |
| 29 |  | 26 | $\begin{array}{\|l\|} \hline 15 \\ 35 \\ \hline \end{array}$ | $\begin{aligned} & 39 \\ & 35 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 39 \\ 45 \\ \hline \end{array}$ |  | 1 | $\begin{aligned} & 24 \\ & 34 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 39 \\ 41 \end{array}$ | $\begin{array}{r} 3 \\ 12 \end{array}$ |  | 35 | $\begin{aligned} & 38 \\ & 33 \\ & \hline \end{aligned}$ | $\begin{aligned} & 47 \\ & 46 \end{aligned}$ | $\begin{aligned} & 6 \\ & 2 \end{aligned}$ |  | 8 | $\begin{array}{\|l} 57 \\ 3^{2} \\ \hline \end{array}$ | $\begin{aligned} & 26 \\ & 50 \end{aligned}$ | $\begin{array}{\|l} \mathbf{1 7} \\ 15 \\ \hline \end{array}$ |  | 41 | $\begin{aligned} & 20 \\ & 3^{1} \\ & \hline \end{aligned}$ | $\begin{array}{\|r} \mathbf{0} \\ 53 \\ \hline \end{array}$ | $\begin{array}{r} 4 \\ 51 \\ \hline \end{array}$ | 29 |
| 30 | 49 | 26 | $\begin{aligned} & \mathbf{5 1} \\ & 35 \end{aligned}$ | $\begin{aligned} & 15 \\ & 34 \end{aligned}$ | $\begin{array}{\|l\|} \hline 24 \\ 51 \\ \hline \end{array}$ | 50 | 1 | $\begin{aligned} & 59 \\ & 34 \\ & \hline \end{aligned}$ | $\begin{aligned} & 20 \\ & 40 \end{aligned}$ | $\begin{aligned} & 15 \\ & 18 \end{aligned}$ | 50 | $3^{6}$ | $\begin{aligned} & 12 \\ & 33 \end{aligned}$ | $\begin{aligned} & 33 \\ & 45 \\ & \hline \end{aligned}$ | $\begin{aligned} & \hline 8 \\ & 7 \\ & \hline \end{aligned}$ | 51 | 9 | $\begin{aligned} & 30 \\ & 3^{2} \end{aligned}$ | $\begin{aligned} & \mathbf{1 6} \\ & 49 \\ & \hline \end{aligned}$ | $\begin{aligned} & 32 \\ & 18 \end{aligned}$ | $5^{1}$ | 41 | $\begin{array}{\|l} 5^{1} \\ 3^{1} \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 53 \\ 52 \\ \hline \end{array}$ | $\begin{aligned} & 55 \\ & 54 \\ & \hline \end{aligned}$ | 30 |

Bürgi's 1' sine table (reconstruction, D. Roegel, 2016)

| , | $55^{\circ}$ |  |  |  |  | $56^{\circ}$ |  |  |  |  | $57^{\circ}$ |  |  |  |  | $58^{\circ}$ |  |  |  |  | $59^{\circ}$ |  |  |  |  | , |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 30 | 49 | 26 | $\begin{array}{\|l\|} \hline 51 \\ 35 \end{array}$ | $\begin{aligned} & 15 \\ & 34 \end{aligned}$ | $\begin{aligned} & 24 \\ & 51 \\ & \hline \end{aligned}$ | 50 | 1 | $\begin{array}{\|l\|} \hline \mathbf{5 9} \\ 34 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 20 \\ 40 \\ \hline \end{array}$ | $\begin{aligned} & 15 \\ & 18 \end{aligned}$ | 50 | 36 | $\begin{aligned} & \hline 12 \\ & 33 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 33 \\ 45 \\ \hline \end{array}$ | $\begin{aligned} & \hline 8 \\ & 7 \\ & \hline \end{aligned}$ | 51 | 9 | $\begin{aligned} & 30 \\ & 32 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline \mathbf{1 6} \\ 49 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{3 2}^{2} \\ & 18 \end{aligned}$ | 51 | 41 | $\begin{aligned} & \hline \mathbf{5 1} \\ & 31 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 53 \\ 52 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 55 \\ 54 \\ \hline \end{array}$ | 30 |
| 31 |  | 27 | $\begin{aligned} & 26 \\ & 35 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 50 \\ 33 \\ \hline \end{array}$ | $\begin{aligned} & 15 \\ & 57 \end{aligned}$ |  | 2 | $\begin{array}{\|l\|} \hline 34 \\ 34 \\ \hline \end{array}$ | $\begin{array}{r} \mathbf{o} \\ 39 \\ \hline \end{array}$ | $\begin{aligned} & 33 \\ & 23 \\ & \hline \end{aligned}$ |  | 36 | $\begin{aligned} & 46 \\ & 33 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline \mathbf{1 8} \\ 44 \\ \hline \end{array}$ | $\begin{aligned} & 15 \\ & 11 \end{aligned}$ |  | 10 | $\begin{array}{r} 3 \\ 3^{2} \\ \hline \end{array}$ | $\begin{array}{r} 5 \\ 48 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{5 0} \\ & 22 \end{aligned}$ |  | 42 | $\begin{aligned} & 23 \\ & 31 \\ & \hline \end{aligned}$ | $\begin{aligned} & 46 \\ & 51 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 49 \\ 58 \\ \hline \end{array}$ | 31 |
| 32 |  | 28 | $\begin{array}{r} 2 \\ 35 \end{array}$ | $\begin{array}{\|l} \mathbf{2 4} \\ 33 \\ \hline \end{array}$ | $\begin{array}{r} 12 \\ 2 \end{array}$ |  | 3 | $\begin{array}{r} 8 \\ 34 \\ \hline \end{array}$ | $\begin{aligned} & 39 \\ & 38 \\ & \hline \end{aligned}$ | $\begin{aligned} & 56 \\ & 28 \end{aligned}$ |  | 37 | $\begin{aligned} & 20 \\ & 33 \\ & \hline \end{aligned}$ | $\begin{array}{\|r} \hline \mathbf{2} \\ 43 \\ \hline \end{array}$ | $\begin{aligned} & 26 \\ & 15 \end{aligned}$ |  | 10 | $\begin{aligned} & 35 \\ & 32 \\ & \hline \end{aligned}$ | $\begin{array}{\|} \mathbf{5 4} \\ \mathbf{4 7} \\ \hline \end{array}$ | $\begin{aligned} & 12 \\ & 26 \end{aligned}$ |  | 42 | $\begin{aligned} & 55 \\ & 31 \\ & \hline \end{aligned}$ | $\begin{aligned} & 38 \\ & 51 \\ & \hline \end{aligned}$ | $\begin{array}{r} 47 \\ 0 \end{array}$ | $3^{2}$ |
| 33 |  | 28 | $\begin{array}{\|l} 37 \\ 35 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 57 \\ 3^{2} \\ \hline \end{array}$ | $\begin{array}{r} 14 \\ \hline 9 \\ \hline \end{array}$ |  | 3 | $\begin{array}{\|l\|} \hline 43 \\ 34 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline \mathbf{1 8} \\ 37 \\ \hline \end{array}$ | $\begin{array}{\|l} \mathbf{2 4} \\ 33 \\ \hline \end{array}$ |  | 37 | $\begin{array}{\|l} 53 \\ 33 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 45 \\ 42 \\ \hline \end{array}$ | $\begin{aligned} & 41 \\ & 20 \\ & \hline \end{aligned}$ |  | 11 | $\begin{array}{\|r} 8 \\ 3^{2} \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 41 \\ 46 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 3^{8} \\ 30 \\ \hline \end{array}$ |  | 43 | $\begin{aligned} & 27 \\ & 31 \\ & \hline \end{aligned}$ | $\begin{aligned} & 29 \\ & 50 \\ & \hline \end{aligned}$ | $\begin{array}{r} 47 \\ \hline \\ \hline \end{array}$ | 33 |
| 34 |  | 29 | $\begin{array}{\|l} \hline \mathbf{1 3} \\ 35 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 29 \\ 31 \\ \hline \end{array}$ | $\begin{aligned} & 23 \\ & 14 \\ & \hline \end{aligned}$ |  | 4 | $\begin{aligned} & 17 \\ & 34 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 55 \\ 36 \\ \hline \end{array}$ | $\begin{array}{\|l} 57 \\ 38 \\ \hline \end{array}$ |  | $3^{8}$ | $\begin{array}{\|l\|} \hline 27 \\ 33 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 28 \\ 41 \\ \hline \end{array}$ | $\begin{array}{r} 1 \\ \mathbf{2 5} \\ \hline \end{array}$ |  | 11 | $\begin{array}{\|l\|} \hline 4^{1} \\ 3^{2} \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline \mathbf{2 8} \\ 45 \\ \hline \end{array}$ | $\begin{array}{\|r} \hline 8 \\ 34 \\ \hline \end{array}$ |  | 43 | $\begin{aligned} & \hline 59 \\ & 31 \\ & \hline \end{aligned}$ | $\begin{aligned} & \hline 19 \\ & 49 \\ & \hline \end{aligned}$ | $\begin{array}{r} 51 \\ 8 \end{array}$ | 34 |
| 35 |  | 29 | $\begin{aligned} & 49 \\ & 35 \end{aligned}$ | $\begin{gathered} \mathrm{o} \\ 30 \end{gathered}$ | $\begin{aligned} & 37 \\ & 19 \end{aligned}$ |  | 4 | $\begin{array}{\|l\|} \hline \mathbf{5 2} \\ 34 \\ \hline \end{array}$ | $\begin{aligned} & 32 \\ & 35 \end{aligned}$ | $\begin{aligned} & 35 \\ & 43 \end{aligned}$ |  | 39 | $\begin{array}{r} \mathbf{1} \\ 33 \\ \hline \end{array}$ | $\begin{array}{r} 9 \\ 40 \\ \hline \end{array}$ | $\begin{aligned} & 26 \\ & 29 \end{aligned}$ |  | 12 | $\begin{aligned} & 14 \\ & 3^{2} \end{aligned}$ | $\begin{array}{\|l\|} \hline 13 \\ 44 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{4 2} \\ & 38 \end{aligned}$ |  | 44 | $\begin{aligned} & \hline \mathbf{3 1} \\ & 31 \\ & \hline \end{aligned}$ | $\begin{array}{r} 8 \\ 48 \\ \hline \end{array}$ | $\begin{aligned} & 59 \\ & 10 \end{aligned}$ | 35 |
| 36 |  | 30 | $\begin{array}{\|l} \mathbf{2 4} \\ 35 \\ \hline \end{array}$ | $\begin{aligned} & 30 \\ & 29 \\ & \hline \end{aligned}$ | $\begin{aligned} & 56 \\ & 26 \end{aligned}$ |  | 5 | $\begin{array}{\|l\|} \hline 27 \\ 34 \\ \hline \end{array}$ | $\begin{array}{\|r\|} \hline 8 \\ 34 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline \mathbf{1 8} \\ 49 \\ \hline \end{array}$ |  | 39 | $\begin{aligned} & 34 \\ & 33 \\ & \hline \end{aligned}$ | $\begin{aligned} & 49 \\ & 39 \\ & \hline \end{aligned}$ | $\begin{aligned} & \mathbf{5 5} \\ & 33 \end{aligned}$ |  | 12 | $\begin{aligned} & 4^{6} \\ & 3^{2} \end{aligned}$ | $\begin{array}{\|l\|} \hline 58 \\ 43 \\ \hline \end{array}$ | $\begin{aligned} & 20 \\ & 41 \end{aligned}$ |  | 45 | $\begin{array}{r} 2 \\ 31 \\ \hline \end{array}$ | $\begin{aligned} & \hline 57 \\ & 47 \\ & \hline \end{aligned}$ | 9 14 | 36 |
| 37 |  | 31 | $\begin{array}{r} \mathbf{0} \\ 35 \\ \hline \end{array}$ | $\begin{array}{r} \mathbf{0} \\ 28 \\ \hline \end{array}$ | $\begin{aligned} & 22 \\ & 3^{1} \\ & \hline \end{aligned}$ |  | 6 | $\begin{array}{r} \mathbf{1} \\ 34 \\ \hline \end{array}$ | $\begin{aligned} & 43 \\ & 33 \end{aligned}$ | $\begin{array}{r} 7 \\ 53 \\ \hline \end{array}$ |  | 40 | $\begin{array}{\|r\|} \hline 8 \\ 33 \\ \hline \end{array}$ | $\begin{aligned} & 29 \\ & 38 \\ & \hline \end{aligned}$ | $\begin{aligned} & 28 \\ & 38 \\ & \hline \end{aligned}$ |  | 13 | $\begin{aligned} & 19 \\ & 3^{2} \end{aligned}$ | $\begin{array}{\|l} \hline 42 \\ 42 \\ \hline \end{array}$ | $\begin{array}{r} 1 \\ 4^{6} \\ \hline \end{array}$ |  | 45 | $\begin{aligned} & \hline 34 \\ & 31 \\ & \hline \end{aligned}$ | $\begin{array}{r} 44 \\ 46 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 23 \\ 17 \\ \hline \end{array}$ | 37 |
| $3^{8}$ |  | 31 | $\begin{aligned} & 35 \\ & 35 \\ & \hline \end{aligned}$ | $\begin{aligned} & 28 \\ & 27 \\ & \hline \end{aligned}$ | $\begin{aligned} & 53 \\ & 36 \\ & \hline \end{aligned}$ |  | 6 | $\begin{aligned} & 36 \\ & 34 \\ & \hline \end{aligned}$ | $\begin{aligned} & 17 \\ & 32 \end{aligned}$ | $\begin{array}{r} \mathbf{o} \\ 59 \\ \hline \end{array}$ |  | 40 | $\begin{array}{\|l\|} \hline \mathbf{4 2} \\ 33 \\ \hline \end{array}$ | $\begin{array}{\|r} \hline 8 \\ 37 \\ \hline \end{array}$ | $\begin{array}{r} 6 \\ 42 \\ \hline \end{array}$ |  | 13 | $\begin{aligned} & 5^{2} \\ & 3^{2} \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 24 \\ 41 \\ \hline \end{array}$ | $\begin{array}{\|l} 47 \\ 49 \\ \hline \end{array}$ |  | 46 | $\begin{array}{r} 6 \\ 31 \\ \hline \end{array}$ | $\begin{aligned} & 30 \\ & 45 \\ & \hline \end{aligned}$ | $\begin{gathered} 40 \\ 20 \end{gathered}$ | $3^{8}$ |
| 39 |  | 32 | $\begin{aligned} & 10 \\ & 35 \\ & \hline \end{aligned}$ | $\begin{aligned} & 56 \\ & 26 \end{aligned}$ | $\begin{aligned} & 29 \\ & 43 \end{aligned}$ |  | 7 | $\begin{aligned} & 10 \\ & 34 \\ & \hline \end{aligned}$ | $\begin{aligned} & 49 \\ & 32 \\ & \hline \end{aligned}$ | $\begin{array}{\|r} 59 \\ 3 \end{array}$ |  | 41 | $\begin{aligned} & 15 \\ & 33 \end{aligned}$ | $\begin{aligned} & 45 \\ & 36 \\ & \hline \end{aligned}$ | $\begin{aligned} & 48 \\ & 47 \end{aligned}$ |  | 14 | $\begin{aligned} & 25 \\ & 3^{2} \end{aligned}$ | $\begin{array}{r} 6 \\ 40 \\ \hline \end{array}$ | $\begin{aligned} & 36 \\ & 53 \end{aligned}$ |  | 46 | $\begin{aligned} & 38 \\ & 31 \\ & \hline \end{aligned}$ | $\begin{aligned} & \hline \mathbf{1 6} \\ & 44 \\ & \hline \end{aligned}$ | $\begin{array}{r} 10 \\ 24 \\ \hline \end{array}$ | 39 |
| 40 | 49 | 32 | $\begin{gathered} 46 \\ 35 \end{gathered}$ | $\begin{array}{\|l} 23 \\ 25 \end{array}$ | $\begin{aligned} & 12 \\ & 48 \end{aligned}$ | 50 | 7 | $\begin{aligned} & 45 \\ & 34 \end{aligned}$ | $\begin{aligned} & 22 \\ & 31 \end{aligned}$ | $\begin{aligned} & 2 \\ & 9 \\ & \hline \end{aligned}$ | 50 | 41 | $\begin{aligned} & 49 \\ & 33 \end{aligned}$ | $\begin{aligned} & 22 \\ & 35 \end{aligned}$ | $\begin{aligned} & 35 \\ & 51 \end{aligned}$ | 51 | 14 | $\begin{aligned} & 57 \\ & 32 \end{aligned}$ | $\begin{aligned} & 47 \\ & 39 \\ & \hline \end{aligned}$ | $\begin{aligned} & 29 \\ & 57 \end{aligned}$ | 51 | 47 | $\begin{aligned} & 10 \\ & 31 \end{aligned}$ | $\begin{array}{r} \mathbf{0} \\ 43 \end{array}$ | $\begin{aligned} & 24 \\ & 26 \end{aligned}$ | 40 |
| 41 |  | 33 | $\begin{aligned} & 21 \\ & 35 \end{aligned}$ | $\begin{aligned} & 49 \\ & 24 \end{aligned}$ | $\begin{array}{r} \mathbf{o} \\ 54 \\ \hline \end{array}$ |  | 8 | $\begin{aligned} & 19 \\ & 34 \end{aligned}$ | $\begin{aligned} & 53 \\ & 30 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 11 \\ 13 \\ \hline \end{array}$ |  | 42 | $\begin{aligned} & 22 \\ & 33 \end{aligned}$ | $\begin{array}{\|l} \hline 58 \\ 34 \\ \hline \end{array}$ | $\begin{aligned} & 26 \\ & 56 \end{aligned}$ |  | 15 | $\begin{aligned} & 30 \\ & 32 \end{aligned}$ | $\begin{aligned} & 27 \\ & 39 \end{aligned}$ | $\begin{array}{r} 26 \\ 0 \end{array}$ |  | 47 | $\begin{aligned} & 41 \\ & 31 \\ & \hline \end{aligned}$ | $\begin{aligned} & 43 \\ & 42 \end{aligned}$ | $\begin{aligned} & 50 \\ & 30 \end{aligned}$ | 41 |
| 42 |  | 33 | $\begin{aligned} & 57 \\ & 35 \end{aligned}$ | $\begin{aligned} & 13 \\ & 23 \\ & \hline \end{aligned}$ | $\begin{aligned} & 54 \\ & 59 \end{aligned}$ |  | 8 | $\begin{aligned} & 54 \\ & 34 \end{aligned}$ | $\begin{aligned} & 23 \\ & 29 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 24 \\ 19 \end{array}$ |  | 42 | $\begin{aligned} & \mathbf{5 6} \\ & 33 \end{aligned}$ | $\begin{aligned} & 33 \\ & 33 \end{aligned}$ | $\begin{aligned} & 22 \\ & 59 \end{aligned}$ |  | 16 | $\begin{array}{r} 3 \\ 32 \end{array}$ | $\begin{array}{r} 6 \\ 38 \\ \hline \end{array}$ | $\begin{array}{r} 26 \\ 5 \end{array}$ |  | 48 | $\begin{aligned} & 13 \\ & 31 \\ & \hline \end{aligned}$ | $\begin{aligned} & 26 \\ & 41 \end{aligned}$ | $\begin{array}{\|} \mathbf{2 0} \\ 33 \\ \hline \end{array}$ | 42 |
| 43 |  | 34 | $\begin{aligned} & \mathbf{3 2}^{2} \\ & 35 \end{aligned}$ | $\begin{aligned} & 37 \\ & 23 \\ & \hline \end{aligned}$ | $\begin{array}{\|c} 53 \\ 5 \\ \hline \end{array}$ |  | 9 | $\begin{array}{\|l\|} \hline 28 \\ 34 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{5 2} \\ & 28 \end{aligned}$ | $\begin{array}{\|l} \hline 43 \\ 23 \\ \hline \end{array}$ |  | 43 | $\begin{array}{\|l\|} \hline \mathbf{3 0} \\ 33 \\ \hline \end{array}$ | $\begin{array}{r} 7 \\ 33 \\ \hline \end{array}$ | $\begin{array}{r} 21 \\ \hline \end{array}$ |  | 16 | $\begin{aligned} & 35 \\ & 3^{2} \end{aligned}$ | $\begin{array}{\|l\|} \hline 44 \\ 37 \\ \hline \end{array}$ | $\begin{array}{r} \mathbf{3 1} \\ 8 \end{array}$ |  | 48 | $\begin{aligned} & 45 \\ & 31 \\ & \hline \end{aligned}$ | $\begin{array}{r} 7 \\ 40 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 53 \\ 36 \\ \hline \end{array}$ | 43 |
| 44 |  | 35 | $\begin{array}{r} 8 \\ 35 \\ \hline \end{array}$ | $\begin{array}{r} 0 \\ 22 \end{array}$ | $\begin{aligned} & \hline 58 \\ & 11 \end{aligned}$ |  | 10 | $\begin{array}{r} 3 \\ 34 \end{array}$ | $\begin{array}{\|l} \mathbf{2 1} \\ \mathbf{2 7} \\ \hline \end{array}$ | $\begin{array}{r} 6 \\ 29 \end{array}$ |  | 44 | $\begin{array}{r} 3 \\ 33 \\ \hline \end{array}$ | $\begin{aligned} & 40 \\ & 32 \end{aligned}$ | $\begin{array}{r} 26 \\ 8 \end{array}$ |  | 17 | $\begin{array}{r} 8 \\ 32 \end{array}$ | $\begin{aligned} & \mathbf{2 1} \\ & 36 \\ & \hline \end{aligned}$ | $\left\lvert\, \begin{aligned} & 39 \\ & 12 \end{aligned}\right.$ |  | 49 | $\begin{aligned} & \hline 16 \\ & 31 \\ & \hline \end{aligned}$ | $\begin{aligned} & 48 \\ & 39 \end{aligned}$ | $\begin{array}{\|l} 29 \\ 40 \\ \hline \end{array}$ | 44 |
| 45 |  | 35 | $\begin{aligned} & 43 \\ & 35 \\ & \hline \end{aligned}$ | $\begin{aligned} & 23 \\ & 21 \\ & \hline \end{aligned}$ | $\begin{array}{r} 9 \\ 16 \\ \hline \end{array}$ |  | 10 | $\begin{aligned} & 37 \\ & 34 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 48 \\ 26 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 35 \\ 33 \\ \hline \end{array}$ |  | 44 | $\begin{array}{\|l\|} \hline 37 \\ 33 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 12 \\ 31 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 34 \\ 13 \\ \hline \end{array}$ |  | 17 | $\begin{array}{\|l} \hline 4^{0} \\ 3^{2} \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 57 \\ 35 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline \mathbf{5 1} \\ \mathbf{1 5} \\ \hline \end{array}$ |  | 49 | $\begin{aligned} & 4^{8} \\ & 31 \\ & \hline \end{aligned}$ | $\begin{aligned} & \hline 28 \\ & 38 \\ & \hline \end{aligned}$ | $\begin{array}{r} 9 \\ 4^{2} \\ \hline \end{array}$ | 45 |
| 46 |  | 36 | $\begin{aligned} & \hline \mathbf{1 8} \\ & \mathbf{3 5} \\ & \hline \end{aligned}$ | $\begin{aligned} & 44 \\ & 20 \end{aligned}$ | $\begin{aligned} & 25 \\ & 22 \end{aligned}$ |  | 11 | $\begin{array}{\|l} 12 \\ 34 \\ \hline \end{array}$ | $\begin{aligned} & 15 \\ & 25 \\ & \hline \end{aligned}$ | $\begin{array}{r} 8 \\ 39 \\ \hline \end{array}$ |  | 45 | $\begin{aligned} & \mathbf{1 0} \\ & 33 \end{aligned}$ | $\begin{aligned} & 43 \\ & 30 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 47 \\ 17 \\ \hline \end{array}$ |  | 18 | $\begin{aligned} & 13 \\ & 3^{2} \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 33 \\ 34 \\ \hline \end{array}$ | $\begin{array}{r} 6 \\ 20 \end{array}$ |  | 50 | $\begin{aligned} & 20 \\ & 31 \\ & \hline \end{aligned}$ | $\begin{array}{r} 6 \\ 37 \end{array}$ | $\begin{array}{\|l} \mathbf{5 1} \\ 46 \\ \hline \end{array}$ | 46 |
| 47 |  | 36 | $\begin{aligned} & 54 \\ & 35 \\ & \hline \end{aligned}$ | $\begin{array}{r} 4 \\ 19 \\ \hline \end{array}$ | $\begin{aligned} & 47 \\ & 28 \end{aligned}$ |  | 11 | $\begin{aligned} & 46 \\ & 34 \end{aligned}$ | $\begin{aligned} & 40 \\ & 24 \end{aligned}$ | $\begin{array}{\|l} 47 \\ 43 \end{array}$ |  | 45 | $\begin{array}{\|l} 44 \\ 33 \\ \hline \end{array}$ | $\begin{array}{\|l} 14 \\ 29 \\ \hline \end{array}$ | $\begin{array}{r} 4 \\ 22 \end{array}$ |  | 18 | $\begin{aligned} & 4^{6} \\ & 3^{2} \end{aligned}$ | $\begin{array}{r} 7 \\ 33 \end{array}$ | $\begin{array}{\|l} \hline 26 \\ 23 \\ \hline \end{array}$ |  | 50 | $\begin{aligned} & 5^{1} \\ & 31 \\ & \hline \end{aligned}$ | $\begin{aligned} & 44 \\ & 36 \\ & \hline \end{aligned}$ | $\begin{array}{r} 37 \\ 49 \\ \hline \end{array}$ | 47 |
| 48 |  | 37 | $\begin{aligned} & 29 \\ & 35 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 24 \\ 18 \end{array}$ | $\begin{aligned} & 15 \\ & 33 \end{aligned}$ |  | 12 | $\begin{aligned} & 21 \\ & 34 \\ & \hline \end{aligned}$ | $\begin{array}{\|r} \hline 5 \\ 23 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{3 0} \\ & 48 \end{aligned}$ |  | 46 | $\begin{aligned} & 17 \\ & 33 \\ & \hline \end{aligned}$ | $\begin{aligned} & 43 \\ & 28 \end{aligned}$ | $\begin{aligned} & 26 \\ & 26 \end{aligned}$ |  | 19 | $\begin{aligned} & 18 \\ & 32 \end{aligned}$ | $\begin{array}{\|l} \hline 40 \\ 32 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 49 \\ 27 \\ \hline \end{array}$ |  | 51 | $\begin{aligned} & 23 \\ & 31 \\ & \hline \end{aligned}$ | $\begin{aligned} & 21 \\ & 35 \\ & \hline \end{aligned}$ | $\begin{aligned} & 26 \\ & 52 \\ & \hline \end{aligned}$ | 48 |
| 49 |  | 38 | $\begin{array}{r} 4 \\ 35 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{4 2} \\ & 17 \end{aligned}$ | $\begin{aligned} & 48 \\ & 38 \end{aligned}$ |  | 12 | $\begin{aligned} & 55 \\ & 34 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 29 \\ 22 \end{array}$ | $\begin{aligned} & \mathbf{1 8} \\ & 54 \end{aligned}$ |  | 46 | $\begin{array}{\|l\|} \hline \mathbf{5 1} \\ 33 \end{array}$ | $\begin{array}{\|l\|} \hline 11 \\ 27 \\ \hline \end{array}$ | $\begin{aligned} & 5^{2} \\ & 30 \\ & \hline \end{aligned}$ |  | 19 | $\begin{aligned} & 5^{1} \\ & 3^{2} \end{aligned}$ | $\begin{aligned} & \hline 13 \\ & 31 \\ & \hline \end{aligned}$ | $\begin{aligned} & 16 \\ & 30 \\ & \hline \end{aligned}$ |  | 51 | $\begin{aligned} & 54 \\ & 31 \\ & \hline \end{aligned}$ | $\begin{aligned} & 57 \\ & 34 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 18 \\ 55 \\ \hline \end{array}$ | 49 |
| 50 | 49 | $3^{8}$ | $\begin{array}{\|l} 40 \\ 35 \\ \hline \end{array}$ | $\begin{array}{r} 0 \\ 16 \end{array}$ | $\begin{aligned} & \mathbf{2 6} \\ & 44 \\ & \hline \end{aligned}$ | 50 | 13 | $\begin{array}{r} 29 \\ 34 \\ \hline \end{array}$ | $\begin{aligned} & 52 \\ & 21 \end{aligned}$ | $\begin{array}{\|l\|} \mathbf{1 2} \\ 58 \\ \hline \end{array}$ | 50 | 47 | $\begin{aligned} & 24 \\ & 33 \\ & \hline \end{aligned}$ | $\begin{aligned} & 39 \\ & 26 \end{aligned}$ | $\begin{aligned} & 22 \\ & 35 \\ & \hline \end{aligned}$ | 51 | 20 | $\begin{aligned} & 23 \\ & 32 \end{aligned}$ | $\begin{aligned} & 44 \\ & 30 \\ & \hline \end{aligned}$ | $\begin{aligned} & 46 \\ & 34 \end{aligned}$ | $5^{1}$ | 52 | $\begin{aligned} & 26 \\ & 31 \\ & \hline \end{aligned}$ | $\begin{aligned} & \mathbf{3 2} \\ & 33 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 13 \\ 58 \\ \hline \end{array}$ | 50 |
| 51 |  | 39 | $\begin{aligned} & 15 \\ & 35 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \mathbf{1 7} \\ 15 \\ \hline \end{array}$ | $\begin{aligned} & 10 \\ & 50 \\ & \hline \end{aligned}$ |  | 14 | $\begin{array}{r} 4 \\ 34 \\ \hline \end{array}$ | $\begin{aligned} & 14 \\ & 21 \end{aligned}$ | $\begin{array}{r} 10 \\ 3 \end{array}$ |  | 47 | $\begin{aligned} & 58 \\ & 33 \end{aligned}$ | $\begin{array}{r} 5 \\ 25 \\ \hline \end{array}$ | $\begin{array}{\|l} 57 \\ 39 \\ \hline \end{array}$ |  | 20 | $\begin{aligned} & 56 \\ & 32 \end{aligned}$ | $\begin{array}{\|l\|} \hline 15 \\ 29 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 20 \\ 38 \\ \hline \end{array}$ |  | 52 | $\begin{aligned} & 58 \\ & 31 \\ & \hline \end{aligned}$ | $\begin{array}{r} 6 \\ 33 \\ \hline \end{array}$ | $\begin{array}{r} 11 \\ 2 \end{array}$ | 51 |
| 52 |  | 39 | $\begin{aligned} & 50 \\ & 35 \\ & \hline \end{aligned}$ | $\begin{aligned} & 33 \\ & 14 \\ & \hline \end{aligned}$ | $\begin{array}{r} \mathbf{0} \\ 55 \\ \hline \end{array}$ |  | 14 | $\begin{array}{\|l\|} \hline 38 \\ 34 \\ \hline \end{array}$ | $\begin{array}{l\|l\|} \hline 35 \\ 20 \end{array}$ | $\begin{array}{r} 13 \\ 8 \end{array}$ |  | 48 | $\begin{aligned} & \mathbf{3 1} \\ & 33 \end{aligned}$ | $\begin{array}{\|l} \hline 3 \mathbf{1} \\ 24 \\ \hline \end{array}$ | $\begin{aligned} & 36 \\ & 43 \end{aligned}$ |  | 21 | $\begin{aligned} & 28 \\ & 32 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 44 \\ 28 \\ \hline \end{array}$ | $\begin{aligned} & 58 \\ & 4^{2} \end{aligned}$ |  | 53 | $\begin{aligned} & 29 \\ & 31 \\ & \hline \end{aligned}$ | $\begin{aligned} & \hline 39 \\ & 32 \\ & \hline \end{aligned}$ | $\begin{array}{\|r} \hline 13 \\ \hline \end{array}$ | 52 |
| 53 |  | 40 | $\begin{aligned} & 25 \\ & 35 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 47 \\ 14 \end{array}$ | $\begin{array}{r} 55 \\ 1 \end{array}$ |  | 15 | $\begin{array}{\|l} 12 \\ 34 \\ \hline \end{array}$ | $\begin{aligned} & 55 \\ & 19 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 21 \\ 13 \\ \hline \end{array}$ |  | 49 | $\begin{array}{r} 4 \\ 33 \end{array}$ | $\begin{aligned} & 56 \\ & 23 \\ & \hline \end{aligned}$ | $19$ |  | 22 | $\begin{array}{r} 1 \\ 3^{2} \end{array}$ | $\begin{array}{\|l\|} \hline 13 \\ 27 \\ \hline \end{array}$ | $\begin{aligned} & 40 \\ & 45 \end{aligned}$ |  | 54 | $\begin{array}{r} 1 \\ 3^{1} \end{array}$ | $\begin{aligned} & 11 \\ & 31 \\ & \hline \end{aligned}$ | $\begin{array}{r} 17 \\ 8 \end{array}$ | 53 |
| 54 |  | 41 | $\begin{array}{r} 1 \\ 35 \\ \hline \end{array}$ | $\begin{array}{r} \mathbf{1} \\ \mathbf{1 3} \\ \hline \end{array}$ | $\begin{array}{r} 56 \\ \hline \\ \hline \end{array}$ |  | 15 | $\begin{array}{\|l\|} \hline 47 \\ 34 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 14 \\ 18 \end{array}$ | $\begin{aligned} & 34 \\ & 18 \end{aligned}$ |  | 49 | $\begin{aligned} & 38 \\ & 33 \\ & \hline \end{aligned}$ | $\begin{aligned} & 20 \\ & 22 \end{aligned}$ | $\begin{array}{r} 6 \\ 52 \\ \hline \end{array}$ |  | 22 | $\begin{array}{\|l\|} \hline 33 \\ 32 \\ \hline \end{array}$ | $\begin{aligned} & \hline 41 \\ & 26 \end{aligned}$ | $\begin{array}{\|l} \hline \mathbf{2 5} \\ 49 \\ \hline \end{array}$ |  | 54 | $\begin{aligned} & \hline 3^{2} \\ & 31 \\ & \hline \end{aligned}$ | $\begin{aligned} & 42 \\ & 30 \\ & \hline \end{aligned}$ | $\begin{aligned} & 25 \\ & 10 \end{aligned}$ | 54 |
| 55 |  | 41 | $\begin{aligned} & 36 \\ & 35 \end{aligned}$ | $\begin{array}{\|l\|} \hline 15 \\ 12 \end{array}$ | $\begin{array}{\|r} 3 \\ 11 \end{array}$ |  | 16 | $\begin{aligned} & \mathbf{2 1} \\ & 34 \end{aligned}$ | $\begin{aligned} & \mathbf{3 2} \\ & \mathbf{1 7} \\ & \hline \end{aligned}$ | $\begin{aligned} & 52 \\ & 22 \end{aligned}$ |  | 50 | $\begin{aligned} & \mathbf{1 1} \\ & 33 \end{aligned}$ | $\begin{aligned} & 42 \\ & 21 \end{aligned}$ | $\begin{aligned} & 58 \\ & 56 \end{aligned}$ |  | 23 | $\begin{array}{r} 6 \\ 3^{2} \end{array}$ | $\begin{array}{\|r} \hline 8 \\ 25 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{1 4} \\ & 52 \end{aligned}$ |  | 55 | $\begin{array}{r} 4 \\ 31 \end{array}$ | $\begin{aligned} & 12 \\ & 29 \\ & \hline \end{aligned}$ | $\begin{aligned} & 35 \\ & 14 \end{aligned}$ | 55 |
| 56 |  | 42 | $\begin{array}{\|l\|} \mathbf{1 1} \\ 35 \\ \hline \end{array}$ | $\begin{aligned} & 27 \\ & 11 \end{aligned}$ | $\begin{array}{\|l\|} \hline 14 \\ 18 \end{array}$ |  | 16 | $\begin{aligned} & 55 \\ & 34 \end{aligned}$ | $\begin{aligned} & 50 \\ & 16 \end{aligned}$ | $\begin{array}{\|l\|} \hline \mathbf{1 4} \\ 28 \end{array}$ |  | 50 | $\begin{aligned} & 45 \\ & 33 \end{aligned}$ | $\begin{array}{\|r} 4 \\ 21 \end{array}$ | $\begin{gathered} 54 \\ 0 \end{gathered}$ |  | 23 | $\begin{aligned} & 3^{8} \\ & 3^{2} \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 34 \\ 24 \\ \hline \end{array}$ | $\begin{array}{r} 6 \\ 57 \\ \hline \end{array}$ |  | 55 | $\begin{aligned} & 35 \\ & 31 \\ & \hline \end{aligned}$ | $\begin{aligned} & \mathbf{4 1} \\ & \mathbf{2 8} \end{aligned}$ | $\begin{array}{\|l} 49 \\ 17 \\ \hline \end{array}$ | 56 |
| 57 |  | 42 | $\begin{aligned} & 46 \\ & 35 \end{aligned}$ | $\begin{aligned} & 38 \\ & 10 \end{aligned}$ | $\begin{aligned} & 32 \\ & 22 \end{aligned}$ |  | 17 | $\begin{aligned} & 30 \\ & 34 \end{aligned}$ | $\begin{array}{r} 6 \\ 15 \end{array}$ | $\begin{aligned} & \mathbf{4 2} \\ & 32 \\ & \hline \end{aligned}$ |  | 51 | $\begin{aligned} & 18 \\ & 33 \end{aligned}$ | $\begin{aligned} & 25 \\ & 20 \end{aligned}$ | $\begin{array}{r} 54 \\ 4 \\ \hline \end{array}$ |  | 24 | $\begin{aligned} & 10 \\ & 32 \end{aligned}$ | $\begin{aligned} & 59 \\ & 24 \end{aligned}$ | $\begin{aligned} & \mathbf{3} \\ & \mathbf{0} \end{aligned}$ |  | 56 | $\begin{array}{r} 7 \\ 31 \\ \hline \end{array}$ | $\begin{aligned} & 10 \\ & \mathbf{2 7} \\ & \hline \end{aligned}$ | 6 19 | 57 |
| 58 |  | 43 | $\begin{aligned} & \mathbf{2 1} \\ & 35 \end{aligned}$ | $\begin{array}{r} 48 \\ 9 \end{array}$ | $\begin{array}{\|l} 54 \\ 29 \\ \hline \end{array}$ |  | 18 | $\begin{array}{r} 4 \\ 34 \\ \hline \end{array}$ | $\begin{array}{\|l} 22 \\ 14 \\ \hline \end{array}$ | $\begin{array}{\|l} 14 \\ 38 \\ \hline \end{array}$ |  | 51 | $\begin{aligned} & \mathbf{5 1} \\ & 33 \end{aligned}$ | $\begin{aligned} & 45 \\ & 19 \\ & \hline \end{aligned}$ | $\begin{array}{r} 58 \\ 9 \end{array}$ |  | 24 | $\begin{aligned} & 43 \\ & 32 \end{aligned}$ | $\begin{array}{\|l} 23 \\ 23 \\ \hline \end{array}$ | $3$ |  | 56 | $\begin{aligned} & 3^{8} \\ & 3^{1} \\ & \hline \end{aligned}$ | $\begin{aligned} & 37 \\ & 26 \end{aligned}$ | $\begin{array}{\|l} 25 \\ 23 \\ \hline \end{array}$ | 58 |
| 59 |  | 43 | $\begin{aligned} & 56 \\ & 35 \end{aligned}$ | $\begin{array}{r} 58 \\ 8 \end{array}$ | $\begin{array}{\|l} 23 \\ 33 \\ \hline \end{array}$ |  | 18 | $\begin{aligned} & 38 \\ & 34 \end{aligned}$ | $\begin{aligned} & 36 \\ & 13 \end{aligned}$ | $\begin{aligned} & 52 \\ & 42 \\ & \hline \end{aligned}$ |  | 52 | $\begin{aligned} & 25 \\ & 33 \\ & \hline \end{aligned}$ | $\begin{array}{r} 5 \\ 18 \end{array}$ | $\begin{array}{r} 7 \\ 13 \\ \hline \end{array}$ |  | 25 | $\begin{aligned} & 15 \\ & 32 \end{aligned}$ | $\begin{aligned} & 46 \\ & 22 \end{aligned}$ | $6$ |  | 57 | $\begin{aligned} & 10 \\ & 31 \end{aligned}$ | $\begin{array}{r} 3 \\ 25 \\ \hline \end{array}$ | $\begin{aligned} & 48 \\ & 26 \end{aligned}$ | 59 |
| 60 | 49 | 44 | $\begin{aligned} & \mathbf{3 2}^{2} \\ & 35 \end{aligned}$ | $\begin{aligned} & \hline 6 \\ & 7 \\ & \hline \end{aligned}$ | $\begin{aligned} & 5^{6} \\ & 4^{0} \\ & \hline \end{aligned}$ | 50 | 19 | $\begin{aligned} & 12 \\ & 34 \\ & \hline \end{aligned}$ | $\begin{aligned} & 50 \\ & 12 \end{aligned}$ | $\begin{array}{\|l} 34 \\ 46 \\ \hline \end{array}$ | 50 | 52 | $\begin{array}{\|l\|} \hline 58 \\ 33 \\ \hline \end{array}$ | $\begin{aligned} & 23 \\ & 17 \end{aligned}$ | $\begin{aligned} & 20 \\ & 17 \end{aligned}$ | 51 | 25 | $\begin{aligned} & 48 \\ & 32 \end{aligned}$ | $\begin{array}{\|r\|} \hline 8 \\ 21 \end{array}$ | $\begin{aligned} & 13 \\ & 11 \end{aligned}$ | $5^{1}$ | 57 | $\begin{aligned} & 41 \\ & 31 \end{aligned}$ | $\begin{aligned} & 29 \\ & 24 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 14 \\ 29 \\ \hline \end{array}$ | 60 |

Bürgi's 1' sine table (reconstruction, D. Roegel, 2016)

| , | $60^{\circ}$ |  |  |  |  | $61^{\circ}$ |  |  |  |  | $62^{\circ}$ |  |  |  |  | $63^{\circ}$ |  |  |  |  | $64^{\circ}$ |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 0 | 51 | 57 | $\begin{aligned} & \mathbf{4 1} \\ & 3^{1} \end{aligned}$ | $\begin{array}{\|l} 29 \\ 24 \\ \hline \end{array}$ | $\begin{aligned} & 14 \\ & 29 \\ & \hline \end{aligned}$ | 52 | 28 | $\begin{aligned} & 37 \\ & 30 \end{aligned}$ | $\begin{aligned} & \mathbf{5 1} \\ & \mathbf{2 7} \end{aligned}$ | $\begin{array}{\|l} 24 \\ 13 \\ \hline \end{array}$ | 52 | 58 | $\begin{aligned} & 3^{6} \\ & 29 \end{aligned}$ | $\begin{array}{\|l} \hline 40 \\ 29 \\ \hline \end{array}$ | $\begin{aligned} & 48 \\ & 23 \end{aligned}$ | 53 | 27 | $\begin{array}{\|l} 37 \\ 28 \end{array}$ | $\begin{array}{\|l} 24 \\ 31 \\ \hline \end{array}$ | $\begin{array}{r} 33 \\ 1 \end{array}$ | 53 | 55 | $\begin{aligned} & 39 \\ & 27 \end{aligned}$ | $\begin{aligned} & 30 \\ & 32 \end{aligned}$ | $\begin{gathered} 50 \\ 8 \end{gathered}$ | 0 |
| 1 |  | 58 | $\begin{aligned} & 12 \\ & 31 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 53 \\ 23 \\ \hline \end{array}$ | $\begin{array}{\|l} 43 \\ 32 \\ \hline \end{array}$ |  | 29 | $\begin{array}{r} 8 \\ 30 \end{array}$ | $\begin{aligned} & 18 \\ & 26 \end{aligned}$ | $\begin{array}{\|l} 37 \\ 15 \\ \hline \end{array}$ |  | 59 | 6 29 | $\begin{array}{\|l} 10 \\ 28 \end{array}$ | $\begin{aligned} & 11 \\ & 25 \\ & \hline \end{aligned}$ |  | 28 | +5 | $\begin{aligned} & 55 \\ & 30 \end{aligned}$ | $\begin{gathered} 34 \\ 2 \end{gathered}$ |  | 56 | $\begin{array}{r}7 \\ 27 \\ \hline\end{array}$ | $\begin{array}{r} 2 \\ 31 \\ \hline \end{array}$ | $\begin{array}{r} 58 \\ 9 \end{array}$ | 1 |
| 2 |  | 58 | $\begin{array}{\|l\|} \hline 44 \\ 31 \\ \hline \end{array}$ | $\begin{aligned} & 17 \\ & 22 \end{aligned}$ | $\begin{aligned} & \hline 15 \\ & 35 \\ & \hline \end{aligned}$ |  | 29 | $\begin{aligned} & 3^{8} \\ & 3^{0} \end{aligned}$ | $\begin{aligned} & 44 \\ & 25 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 5^{2} \\ 17 \\ \hline \end{array}$ |  | 59 | $\begin{aligned} & 35 \\ & 29 \end{aligned}$ | $\begin{array}{\|l} \hline 38 \\ 27 \\ \hline \end{array}$ | $\begin{aligned} & 36 \\ & 27 \\ & \hline \end{aligned}$ |  | 28 | $\begin{aligned} & 34 \\ & 28 \end{aligned}$ | $\begin{aligned} & 25 \\ & 29 \end{aligned}$ | $\begin{array}{r} 36 \\ \hline 4 \\ \hline \end{array}$ |  | 56 | $\begin{aligned} & 34 \\ & 27 \end{aligned}$ | $\begin{array}{\|l\|} \hline \mathbf{3 4} \\ 30 \\ \hline \end{array}$ | $\begin{aligned} & 7 \\ & 9 \\ & \hline \end{aligned}$ | 2 |
| 3 |  | 59 | $\begin{array}{\|l\|} \hline 15 \\ 3^{1} \\ \hline \end{array}$ | $\begin{aligned} & 39 \\ & 21 \end{aligned}$ | $\begin{array}{\|l\|} \hline 50 \\ 37 \\ \hline \end{array}$ |  | 30 | $\begin{array}{r} 9 \\ 30 \\ \hline \end{array}$ | $\begin{aligned} & \hline 10 \\ & 24 \\ & \hline \end{aligned}$ | $\begin{array}{r} 9 \\ 20 \end{array}$ | 53 | 0 | $\begin{array}{r} 5 \\ 29 \\ \hline \end{array}$ | $\begin{array}{r} 6 \\ 26 \end{array}$ | $\begin{array}{r} 3 \\ 28 \end{array}$ |  | 29 | $\begin{array}{r} 2 \\ 28 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 54 \\ 28 \end{array}$ | $\begin{array}{r} 40 \\ 5 \\ \hline \end{array}$ |  | 57 | $\begin{array}{\|r} \hline 2 \\ 27 \\ \hline \end{array}$ | $\begin{array}{r} 4 \\ 29 \\ \hline \end{array}$ | $\begin{aligned} & 16 \\ & 10 \end{aligned}$ | 3 |
| 4 |  | 59 | $\begin{array}{\|l} 47 \\ 31 \\ \hline \end{array}$ | $\begin{array}{r} 1 \\ 20 \\ \hline \end{array}$ | $\begin{array}{\|l} 27 \\ 41 \\ \hline \end{array}$ |  | 30 | $\begin{aligned} & 39 \\ & 30 \\ & \hline \end{aligned}$ | $\begin{aligned} & 34 \\ & 23 \\ & \hline \end{aligned}$ | $\begin{aligned} & 29 \\ & 22 \end{aligned}$ |  | 0 | $\begin{array}{\|l} 34 \\ 29 \\ \hline \end{array}$ | $\begin{array}{\|l} \mathbf{3 2} \\ \mathbf{2 5} \\ \hline \end{array}$ | $\begin{array}{\|l} \mathbf{3 1} \\ \mathbf{3 1}^{1} \\ \hline \end{array}$ |  | 29 | $\begin{aligned} & \mathbf{3 1} \\ & \mathbf{2 1} \end{aligned}$ | $\begin{array}{\|l} \mathbf{2 2} \\ \mathbf{2 7} \\ \hline \end{array}$ | $\begin{array}{r} 45 \\ 6 \end{array}$ |  | 57 | $\begin{array}{\|l} 29 \\ 27 \\ \hline \end{array}$ | $\begin{aligned} & 33 \\ & 28 \end{aligned}$ | $\begin{array}{\|l\|} \hline 26 \\ 11 \end{array}$ | 4 |
| 5 | 52 | 0 | $\begin{aligned} & 18 \\ & 31 \\ & \hline \end{aligned}$ | $\begin{aligned} & \mathbf{2 2} \\ & 19 \end{aligned}$ | $\begin{array}{\|r} \hline 8 \\ 44 \\ \hline \end{array}$ |  | 31 | $\begin{array}{r} 9 \\ 30 \end{array}$ | $\begin{aligned} & 57 \\ & 22 \end{aligned}$ | $\begin{array}{\|l} \mathbf{5 1} \\ \mathbf{2 5} \\ \hline \end{array}$ |  | 1 | $\begin{array}{r} 3 \\ 29 \\ \hline \end{array}$ | $\begin{aligned} & 58 \\ & 24 \\ & \hline \end{aligned}$ | $\begin{array}{r} 2 \\ 32 \\ \hline \end{array}$ |  | 29 | $\begin{array}{\|l} 59 \\ 28 \end{array}$ | $\begin{aligned} & 49 \\ & 26 \end{aligned}$ | $\begin{array}{r} 51 \\ 8 \end{array}$ |  | 57 | $\begin{array}{\|l} 57 \\ 27 \\ \hline \end{array}$ | $\begin{array}{\|r} \mathbf{1} \\ \mathbf{2 7} \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 37 \\ 12 \end{array}$ | 5 |
| 6 |  | 0 | $\begin{array}{\|l} 49 \\ 31 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{4 1} \\ & 18 \end{aligned}$ | $\begin{array}{\|l} \mathbf{5 2} \\ 47 \\ \hline \end{array}$ |  | 31 | $\begin{aligned} & 40 \\ & 30 \\ & \hline \end{aligned}$ | $\begin{aligned} & 20 \\ & 21 \end{aligned}$ | $\begin{aligned} & 16 \\ & 27 \end{aligned}$ |  | 1 | $\begin{array}{\|l} 33 \\ 29 \end{array}$ | $\begin{array}{\|l} 22 \\ 23 \end{array}$ | $\begin{array}{\|} 34 \\ 34 \\ \hline \end{array}$ |  | 30 | $\begin{array}{\|l\|} \hline 28 \\ 28 \end{array}$ | $\begin{aligned} & 15 \\ & 25 \end{aligned}$ | $\begin{array}{r} 59 \\ 9 \end{array}$ |  | 58 | $\begin{aligned} & 24 \\ & 27 \\ & \hline \end{aligned}$ | $\begin{aligned} & 28 \\ & 26 \end{aligned}$ | $\begin{array}{\|l} \hline 49 \\ 13 \end{array}$ | 6 |
| 7 |  | 1 | $\begin{aligned} & \hline 21 \\ & 31 \end{aligned}$ | $\begin{array}{r\|} \hline \mathbf{o} \\ \mathbf{1} 7 \end{array}$ | $\begin{aligned} & 39 \\ & 49 \end{aligned}$ |  | 32 | $\begin{aligned} & 10 \\ & 30 \\ & \hline \end{aligned}$ | $\begin{aligned} & 41 \\ & 20 \end{aligned}$ | $\begin{aligned} & 43 \\ & 30 \end{aligned}$ |  | 2 | $\begin{array}{r} 2 \\ 29 \\ \hline \end{array}$ | $\begin{aligned} & 46 \\ & 22 \end{aligned}$ | $\begin{array}{r} 8 \\ 36 \end{array}$ |  | 30 | $\begin{aligned} & 56 \\ & 28 \end{aligned}$ | $\begin{aligned} & \mathbf{4 1} \\ & \mathbf{2 4} \end{aligned}$ | $\begin{array}{r} 8 \\ 10 \end{array}$ |  | 58 | $\begin{array}{\|l} \mathbf{5 1} \\ \mathbf{2 7} \end{array}$ | $\begin{aligned} & 55 \\ & 25 \end{aligned}$ | $\begin{array}{\|r} 2 \\ 13 \\ \hline \end{array}$ | 7 |
| 8 |  | 1 | $\begin{array}{\|l} 5^{2} \\ 3^{1} \\ \hline \end{array}$ | $\begin{aligned} & 18 \\ & 16 \end{aligned}$ | $\begin{aligned} & \mathbf{2 8} \\ & 53 \end{aligned}$ |  | 32 | $\begin{aligned} & \mathbf{4 1}^{1} \\ & \mathbf{3}^{\mathbf{0}} \end{aligned}$ | $\begin{array}{\|r} 2 \\ 19 \\ \hline \end{array}$ | $\begin{array}{\|l} 13 \\ 3^{2} \\ \hline \end{array}$ |  | 2 | $\begin{array}{\|l} 32 \\ 29 \\ \hline \end{array}$ | $\begin{array}{\|r} \hline 8 \\ 21 \end{array}$ | $\begin{aligned} & 44 \\ & 38 \\ & \hline \end{aligned}$ |  | 31 | $\begin{aligned} & 25 \\ & 28 \end{aligned}$ | $\begin{array}{r} 5 \\ 23 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 18 \\ 12 \end{array}$ |  | 59 | $\begin{aligned} & 19 \\ & 27 \\ & \hline \end{aligned}$ | $\begin{aligned} & 20 \\ & 24 \end{aligned}$ | $\begin{array}{\|l} \hline 15 \\ 14 \end{array}$ | 8 |
| 9 |  | 2 | $\left\lvert\, \begin{aligned} & 23 \\ & 31 \end{aligned}\right.$ | $\begin{aligned} & 35 \\ & 15 \\ & \hline \end{aligned}$ | $\begin{aligned} & 21 \\ & 56 \\ & \hline \end{aligned}$ |  | 33 | $\begin{aligned} & 11 \\ & 30 \\ & \hline \end{aligned}$ | $\begin{aligned} & 21 \\ & 18 \end{aligned}$ | $\begin{aligned} & 45 \\ & 34 \end{aligned}$ |  | 3 | $\begin{array}{r} 1 \\ 29 \\ \hline \end{array}$ | $\left\lvert\, \begin{aligned} & 30 \\ & 20 \end{aligned}\right.$ | $\begin{aligned} & 22 \\ & 40 \\ & \hline \end{aligned}$ |  | 31 | $\begin{array}{\|l} 53 \\ 28 \end{array}$ | $\begin{array}{\|l\|} \hline 28 \\ 22 \end{array}$ | $\begin{aligned} & 30 \\ & 13 \\ & \hline \end{aligned}$ |  | 59 | $\begin{aligned} & 46 \\ & 27 \end{aligned}$ | $\begin{array}{\|l} 44 \\ 23 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 29 \\ 15 \end{array}$ | 9 |
| 10 | 52 | 2 | $\begin{aligned} & 54 \\ & 31 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 51 \\ 14 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 17 \\ 58 \\ \hline \end{array}$ | 52 | 33 | $\begin{aligned} & \mathbf{4 1} \\ & \mathbf{3 0}^{\mathbf{0}} \end{aligned}$ | $\begin{array}{\|l} \hline 40 \\ 17 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 19 \\ 36 \\ \hline \end{array}$ | 53 | 3 | $\begin{aligned} & 30 \\ & 29 \end{aligned}$ | $\begin{array}{\|l\|} \hline \mathbf{5 1} \\ 19 \\ \hline \end{array}$ | $\begin{array}{r} 2 \\ 41 \\ \hline \end{array}$ | 53 | 32 | $\begin{aligned} & \mathbf{2 1} \\ & \mathbf{2 8} \\ & \hline \end{aligned}$ | $\begin{aligned} & 50 \\ & 21 \\ & \hline \end{aligned}$ | $\begin{aligned} & 43 \\ & 14 \\ & \hline \end{aligned}$ | 54 | 0 | $\begin{aligned} & 14 \\ & 27 \\ & \hline \end{aligned}$ | $\begin{array}{r} 7 \\ 22 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 44 \\ 16 \\ \hline \end{array}$ |  |
| 11 |  | 3 | $\begin{aligned} & 26 \\ & 31 \\ & \hline \end{aligned}$ | $\begin{array}{\|r\|} \hline 6 \\ 14 \\ \hline \end{array}$ | $\begin{array}{r} 15 \\ 2 \end{array}$ |  | 34 | $\begin{aligned} & 11 \\ & 30 \\ & \hline \end{aligned}$ | $\begin{aligned} & 57 \\ & 16 \end{aligned}$ | $\begin{array}{\|l} \hline 55 \\ 39 \\ \hline \end{array}$ |  | 4 | $\begin{array}{r} \mathbf{0} \\ 29 \end{array}$ | $\begin{aligned} & 10 \\ & 18 \end{aligned}$ | $\begin{aligned} & 43 \\ & 43 \end{aligned}$ |  | 32 | $\begin{aligned} & 50 \\ & 28 \end{aligned}$ | $\begin{aligned} & 11 \\ & 20 \end{aligned}$ | $\begin{aligned} & 57 \\ & 15 \\ & \hline \end{aligned}$ |  | 0 | $\begin{aligned} & \mathbf{4 1} \\ & \mathbf{2 7} \end{aligned}$ | $\begin{aligned} & 30 \\ & 21 \end{aligned}$ | $\begin{array}{\|r} \hline \mathbf{0} \\ \mathbf{1 7} \\ \hline \end{array}$ |  |
| 12 |  | 3 | $\begin{aligned} & 57 \\ & 31 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 20 \\ 13 \\ \hline \end{array}$ | $\begin{array}{\|r\|} \hline 17 \\ \hline \end{array}$ |  | 34 | $\begin{aligned} & 4^{2} \\ & 30 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 14 \\ 15 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 34 \\ 42 \\ \hline \end{array}$ |  | 4 | $\begin{array}{\|l} 29 \\ 29 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 29 \\ 17 \\ \hline \end{array}$ | $\begin{aligned} & 26 \\ & 45 \end{aligned}$ |  | 33 | $\begin{aligned} & 18 \\ & 28 \end{aligned}$ | $\begin{aligned} & \mathbf{3 2} \\ & 19 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 12 \\ 17 \\ \hline \end{array}$ |  | 1 | $\begin{array}{\|r\|} \hline 8 \\ 27 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{5 1} \\ & 20 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 17 \\ 17 \\ \hline \end{array}$ |  |
| 13 |  | 4 | $\begin{aligned} & 28 \\ & 31 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 33 \\ 12 \\ \hline \end{array}$ | $\begin{array}{r} 21 \\ \hline 7 \\ \hline \end{array}$ |  | 35 | $\begin{aligned} & 12 \\ & 30 \\ & \hline \end{aligned}$ | $\begin{aligned} & 30 \\ & 14 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline \mathbf{1 6} \\ 43 \\ \hline \end{array}$ |  | 4 | $\begin{aligned} & 58 \\ & 29 \end{aligned}$ | $\begin{aligned} & 47 \\ & 16 \end{aligned}$ | $\begin{array}{\|l\|} 11 \\ 47 \\ \hline \end{array}$ |  | 33 | $\begin{aligned} & 46 \\ & 28 \end{aligned}$ | $\begin{aligned} & \mathbf{5 1} \\ & \mathbf{1 8} \end{aligned}$ | $\begin{aligned} & 29 \\ & 18 \end{aligned}$ |  | 1 | $\begin{aligned} & 36 \\ & 27 \end{aligned}$ | $\begin{array}{\|l\|} \hline 11 \\ 19 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 34 \\ 18 \end{array}$ |  |
| 14 |  | 4 | $\begin{array}{\|l} 59 \\ 31 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 45 \\ 11 \end{array}$ | $\begin{aligned} & 28 \\ & 10 \\ & \hline \end{aligned}$ |  | 35 | $\begin{aligned} & 42 \\ & 30 \\ & \hline \end{aligned}$ | $\begin{aligned} & 44 \\ & 13 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 59 \\ 46 \\ \hline \end{array}$ |  | 5 | $\begin{aligned} & 28 \\ & 29 \end{aligned}$ | $\begin{array}{r} 3 \\ 15 \\ \hline \end{array}$ | $\begin{aligned} & 58 \\ & 49 \end{aligned}$ |  | 34 | $\begin{array}{\|l} 15 \\ 28 \end{array}$ | $\begin{array}{\|r} \hline 9 \\ 17 \\ \hline \end{array}$ | $\begin{aligned} & 47 \\ & 19 \\ & \hline \end{aligned}$ |  | 2 | $\begin{array}{r} 3 \\ 27 \\ \hline \end{array}$ | $\begin{aligned} & 30 \\ & 18 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 52 \\ 19 \\ \hline \end{array}$ |  |
| 15 |  | 5 | $\begin{aligned} & 30 \\ & 31 \\ & \hline \end{aligned}$ | $\begin{aligned} & 56 \\ & 10 \end{aligned}$ | $\begin{array}{\|l\|} \hline 38 \\ 13 \\ \hline \end{array}$ |  | 36 | $\begin{aligned} & 12 \\ & 30 \\ & \hline \end{aligned}$ | $\begin{aligned} & 58 \\ & 12 \end{aligned}$ | $\begin{array}{\|l} \hline 45 \\ 48 \\ \hline \end{array}$ |  | 5 | $\begin{array}{\|l} 57 \\ 29 \end{array}$ | $\begin{array}{\|l\|} \hline 19 \\ 14 \\ \hline \end{array}$ | $\begin{aligned} & 47 \\ & 50 \\ & \hline \end{aligned}$ |  | 34 | $\begin{array}{\|l} 43 \\ 28 \end{array}$ | $\begin{aligned} & 27 \\ & 16 \end{aligned}$ | $\begin{array}{r} 6 \\ 21 \\ \hline \end{array}$ |  | 2 | $\begin{array}{\|l} \mathbf{3 0} \\ \mathbf{2 7} \\ \hline \end{array}$ | $\begin{array}{\|l} 49 \\ 17 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 11 \\ 19 \\ \hline \end{array}$ |  |
| 16 |  | 6 | $\begin{array}{r} 2 \\ 31 \\ \hline \end{array}$ | $\begin{aligned} & 6 \\ & 9 \\ & \hline \end{aligned}$ | $\begin{aligned} & 51 \\ & 16 \end{aligned}$ |  | 36 | $\begin{aligned} & 43 \\ & 30 \end{aligned}$ | $\begin{aligned} & 11 \\ & 11 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 33 \\ 51 \\ \hline \end{array}$ |  | 6 | $\begin{aligned} & 26 \\ & 29 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 34 \\ 13 \\ \hline \end{array}$ | $\begin{aligned} & 37 \\ & 52 \end{aligned}$ |  | 35 | $\begin{aligned} & 11 \\ & 28 \end{aligned}$ | $\begin{aligned} & 43 \\ & 15 \\ & \hline \end{aligned}$ | $\begin{aligned} & 27 \\ & 22 \end{aligned}$ |  | 2 | $\begin{aligned} & 58 \\ & 27 \end{aligned}$ | $\begin{array}{r} 6 \\ 16 \end{array}$ | $\begin{array}{\|c} 30 \\ 21 \end{array}$ |  |
| 17 |  | 6 | $\begin{aligned} & 33 \\ & 31 \\ & \hline \end{aligned}$ | $\begin{array}{\|r\|} \hline 16 \\ 8 \end{array}$ | $\begin{array}{r} 7 \\ 19 \\ \hline \end{array}$ |  | 37 | $\begin{aligned} & 13 \\ & 30 \\ & \hline \end{aligned}$ | $\begin{aligned} & 23 \\ & 10 \end{aligned}$ | $\begin{array}{\|l} \mathbf{2 4} \\ 53 \\ \hline \end{array}$ |  | 6 | $\begin{aligned} & 55 \\ & 29 \end{aligned}$ | $\begin{aligned} & 48 \\ & 12 \end{aligned}$ | $\begin{aligned} & 29 \\ & 54 \\ & \hline \end{aligned}$ |  | 35 | $\begin{aligned} & 39 \\ & 28 \end{aligned}$ | $\begin{aligned} & 58 \\ & 14 \\ & \hline \end{aligned}$ | $\begin{aligned} & 49 \\ & 23 \\ & \hline \end{aligned}$ |  | 3 | $\begin{array}{\|l} 25 \\ 27 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 22 \\ 15 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{5 1} \\ & \mathbf{2 1} \end{aligned}$ |  |
| 18 |  | 7 | $\begin{array}{r} 4 \\ 3^{1} \\ \hline \end{array}$ | $\begin{array}{\|r\|} \hline 24 \\ 7 \\ \hline \end{array}$ | $\begin{aligned} & 26 \\ & 21 \end{aligned}$ |  | 37 | $\begin{aligned} & 43 \\ & 30 \\ & \hline \end{aligned}$ | $\begin{array}{r} 34 \\ 9 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{1 7} \\ & 55 \\ & \hline \end{aligned}$ |  | 7 | $\begin{aligned} & 25 \\ & 29 \\ & \hline \end{aligned}$ | $\begin{array}{\|r} 1 \\ 11 \end{array}$ | $\begin{aligned} & 23 \\ & 56 \\ & \hline \end{aligned}$ |  | 36 | $\begin{array}{\|r} 8 \\ 28 \end{array}$ | $\begin{array}{\|l} 13 \\ 13 \\ \hline \end{array}$ | $\begin{array}{\|l} 12 \\ 24 \\ \hline \end{array}$ |  | 3 | $\begin{aligned} & 5^{2} \\ & 27 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 38 \\ 14 \\ \hline \end{array}$ | $\begin{aligned} & 12 \\ & 22 \end{aligned}$ |  |
| 19 |  | 7 | $\begin{aligned} & 35 \\ & 31 \\ & \hline \end{aligned}$ | $\begin{array}{r} 31 \\ 6 \end{array}$ | $\begin{aligned} & 47 \\ & 25 \\ & \hline \end{aligned}$ |  | $3^{8}$ | $\begin{aligned} & 13 \\ & 30 \\ & \hline \end{aligned}$ | $\begin{array}{r} 44 \\ 8 \end{array}$ | $\begin{array}{\|l} \hline 12 \\ 57 \\ \hline \end{array}$ |  | 7 | $\begin{aligned} & 54 \\ & 29 \end{aligned}$ | $\begin{array}{\|l} 13 \\ 10 \end{array}$ | $\begin{aligned} & 19 \\ & 57 \\ & \hline \end{aligned}$ |  | 36 | $\begin{aligned} & 36 \\ & 28 \end{aligned}$ | $\begin{aligned} & \hline 26 \\ & 12 \end{aligned}$ | $\begin{array}{\|l} 36 \\ 25 \\ \hline \end{array}$ |  | 4 | $\begin{aligned} & 19 \\ & 27 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 5^{2} \\ 13 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 34 \\ 22 \end{array}$ |  |
| 20 | 52 | 8 | $\begin{array}{r} 6 \\ 31 \end{array}$ | $\begin{array}{r} 38 \\ 5 \end{array}$ | $\begin{array}{\|l} 12 \\ 27 \\ \hline \end{array}$ | 52 | 38 | $\begin{aligned} & 43 \\ & 30 \end{aligned}$ | $\begin{array}{r} 53 \\ 8 \end{array}$ | $\begin{aligned} & 9 \\ & 0 \end{aligned}$ | 53 | 8 | $\begin{array}{\|l} 23 \\ 29 \\ \hline \end{array}$ | $\begin{array}{\|l\|} 24 \\ 10 \end{array}$ | $\begin{gathered} 16 \\ 0 \end{gathered}$ | 53 | 37 | $\begin{array}{\|r} 4 \\ 28 \end{array}$ | $\left\|\begin{array}{l} 39 \\ 11 \end{array}\right\|$ | $\begin{array}{\|r} \mathbf{1} \\ \mathbf{2 7} \\ \hline \end{array}$ | 54 | 4 | $\begin{array}{\|l} 47 \\ 27 \\ \hline \end{array}$ | $\begin{array}{r} 5 \\ 12 \end{array}$ | $\begin{array}{\|l} 56 \\ 23 \\ \hline \end{array}$ |  |
| 21 |  | 8 | $\begin{aligned} & 37 \\ & 31 \\ & \hline \end{aligned}$ | $43$ | $\begin{aligned} & 39 \\ & 30 \\ & \hline \end{aligned}$ |  | 39 | $\begin{aligned} & 14 \\ & 30 \\ & \hline \end{aligned}$ | $\begin{aligned} & \mathbf{1} \\ & 7 \\ & \hline \end{aligned}$ | $\begin{aligned} & 9 \\ & 2 \end{aligned}$ |  | 8 | $\begin{aligned} & 52 \\ & 29 \\ & \hline \end{aligned}$ | $\begin{array}{r} 34 \\ \hline 9 \end{array}$ | $\begin{gathered} 16 \\ 0 \end{gathered}$ |  | 37 | $\begin{aligned} & 32 \\ & 28 \end{aligned}$ | $\begin{aligned} & 50 \\ & 10 \end{aligned}$ | $\begin{aligned} & 28 \\ & 27 \\ & \hline \end{aligned}$ |  | 5 | $\begin{array}{\|l} 14 \\ \mathbf{2 7} \\ \hline \end{array}$ | $\begin{aligned} & \hline 18 \\ & 11 \end{aligned}$ | $\begin{array}{\|l} \hline 19 \\ 24 \\ \hline \end{array}$ |  |
| 22 |  | 9 | $\begin{array}{r} 8 \\ 31 \end{array}$ | $\begin{array}{r} 48 \\ 3 \end{array}$ | $\begin{array}{\|r\|} \hline 9 \\ 33 \end{array}$ |  | 39 | $\begin{aligned} & 44 \\ & 30 \end{aligned}$ | $\begin{aligned} & 8 \\ & 6 \end{aligned}$ | $\begin{array}{r} 11 \\ \hline \end{array}$ |  | 9 | $\begin{array}{\|l} 21 \\ 29 \\ \hline \end{array}$ | $\begin{array}{r} 43 \\ 8 \end{array}$ | $\begin{array}{r} 16 \\ 3 \end{array}$ |  | $3^{8}$ | $\begin{array}{\|r} 1 \\ 28 \\ \hline \end{array}$ | $\begin{aligned} & 0 \\ & 9 \\ & \hline \end{aligned}$ | $\begin{aligned} & 55 \\ & 29 \\ & \hline \end{aligned}$ |  | 5 | $\begin{aligned} & \mathbf{4 1} \\ & \mathbf{2 7} \end{aligned}$ | $\begin{aligned} & 29 \\ & 10 \end{aligned}$ | $\begin{array}{\|l\|} \hline 43 \\ 24 \end{array}$ |  |
| 23 |  | 9 | $\begin{aligned} & 39 \\ & 31 \\ & \hline \end{aligned}$ | $\begin{array}{r} 51 \\ 2 \end{array}$ | $\begin{array}{\|l\|} \hline 42 \\ 35 \\ \hline \end{array}$ |  | 40 | $\begin{aligned} & 14 \\ & 30 \\ & \hline \end{aligned}$ | $\begin{array}{r} 14 \\ 5 \\ \hline \end{array}$ | $15$ |  | 9 | $\begin{aligned} & 50 \\ & 29 \end{aligned}$ | $\begin{array}{r} \mathbf{5 1}^{1} \\ \hline \end{array}$ | $\begin{array}{r} 19 \\ \hline \\ \hline \end{array}$ |  | 38 | $\begin{aligned} & 29 \\ & 28 \end{aligned}$ | $\begin{array}{r} 10 \\ 8 \end{array}$ | $\begin{array}{\|l\|} \hline 24 \\ 31 \\ \hline \end{array}$ |  | 6 | $\begin{array}{r} 8 \\ 27 \\ \hline \end{array}$ | $\begin{array}{r} 40 \\ \hline 9 \end{array}$ | 7 ${ }^{7}$ |  |
| 24 |  | 10 | $\begin{array}{\|l} 10 \\ 31 \\ \hline \end{array}$ | $\left[\begin{array}{c} 54 \\ 1 \end{array}\right.$ | $\begin{array}{\|l} \mathbf{1 7} \\ \mathbf{3 9} \\ \hline \end{array}$ |  | 40 | $\begin{aligned} & 44 \\ & 30 \\ & \hline \end{aligned}$ | $\begin{array}{r} 19 \\ 4 \end{array}$ | $\begin{array}{r} 22 \\ 8 \end{array}$ |  | 10 | $\begin{array}{\|l} 19 \\ 29 \end{array}$ | $\begin{array}{r} 58 \\ 6 \end{array}$ | $\begin{array}{r} 23 \\ 6 \end{array}$ |  | 38 | $\begin{array}{\|l} 57 \\ 28 \\ \hline \end{array}$ | $\begin{array}{r} 18 \\ \hline 7 \end{array}$ | $\begin{aligned} & 55 \\ & 31 \\ & \hline \end{aligned}$ |  | 6 | $\begin{array}{\|l} 35 \\ 27 \\ \hline \end{array}$ | $\begin{array}{r} 49 \\ 8 \end{array}$ | $\begin{array}{\|l} 33 \\ 25 \\ \hline \end{array}$ |  |
| 25 |  | 10 | $\begin{aligned} & \hline \mathbf{4 1} \\ & \mathbf{3}^{1} \\ & \hline \end{aligned}$ | $\begin{array}{r} 55 \\ 0 \end{array}$ | $\begin{array}{\|l} \hline 56 \\ 41 \\ \hline \end{array}$ |  | 41 | $\begin{aligned} & 14 \\ & 30 \\ & \hline \end{aligned}$ | $\begin{array}{\|r} 23 \\ \hline \\ \hline \end{array}$ | $\begin{aligned} & 30 \\ & 11 \end{aligned}$ |  | 10 | $\begin{aligned} & 49 \\ & 29 \end{aligned}$ | $\begin{aligned} & 4 \\ & 5 \\ & \hline \end{aligned}$ | $\begin{array}{r} 29 \\ \hline \end{array}$ |  | 39 | $\begin{aligned} & 25 \\ & 28 \end{aligned}$ | $\begin{array}{r} 26 \\ 6 \end{array}$ | $\begin{array}{\|l\|} \hline 26 \\ 32 \\ \hline \end{array}$ |  | 7 | $\begin{array}{r} 2 \\ 27 \\ \hline \end{array}$ | $\begin{array}{r} 57 \\ \hline 7 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 58 \\ 27 \\ \hline \end{array}$ |  |
| 26 |  | 11 | $\begin{aligned} & 12 \\ & 30 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 56 \\ 59 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 37 \\ 44 \\ \hline \end{array}$ |  | 41 | $\begin{aligned} & 44 \\ & 30 \end{aligned}$ | $\begin{array}{\|r\|} \hline 26 \\ 2 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 41 \\ 13 \\ \hline \end{array}$ |  | 11 | $\begin{array}{\|l} \hline 18 \\ 29 \\ \hline \end{array}$ | $9$ | $\begin{array}{r} 37 \\ \hline 9 \\ \hline \end{array}$ |  | 39 | $\begin{aligned} & 53 \\ & 28 \end{aligned}$ | $\begin{array}{r} \mathbf{3 2} \\ 5 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 58 \\ 34 \\ \hline \end{array}$ |  | 7 | $\begin{aligned} & 30 \\ & 27 \\ & \hline \end{aligned}$ | $\begin{aligned} & 5 \\ & 6 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 25 \\ 27 \\ \hline \end{array}$ |  |
| 27 |  | 11 | $\begin{aligned} & 43 \\ & 30 \end{aligned}$ | $\begin{aligned} & 56 \\ & 58 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 21 \\ 46 \\ \hline \end{array}$ |  | 42 | $\begin{aligned} & 14 \\ & 30 \\ & \hline \end{aligned}$ | $\begin{array}{r} 28 \\ 1 \end{array}$ | $\begin{aligned} & 54 \\ & 16 \end{aligned}$ |  | 11 | $\begin{array}{\|l} 47 \\ 29 \\ \hline \end{array}$ | $13$ | $\begin{aligned} & 46 \\ & 11 \end{aligned}$ |  | 40 | $\begin{aligned} & 21 \\ & 28 \end{aligned}$ | $\begin{array}{\|r\|} \hline 3^{8} \\ 4 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{3 2} \\ & 35 \\ & \hline \end{aligned}$ |  | 7 | $\begin{aligned} & 57 \\ & 27 \\ & \hline \end{aligned}$ | $\begin{array}{\|r} 11 \\ \hline \end{array}$ | $\begin{aligned} & 52 \\ & 28 \end{aligned}$ | 7 |
| 28 |  | 12 | $\begin{aligned} & 14 \\ & 30 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 55 \\ 57 \\ \hline \end{array}$ | $\begin{array}{r} 7 \\ 50 \\ \hline \end{array}$ |  | 42 | $\begin{aligned} & 44 \\ & 30 \end{aligned}$ | $\begin{gathered} 30 \\ 0 \end{gathered}$ | $\begin{array}{\|l} \hline 10 \\ 17 \\ \hline \end{array}$ |  | 12 | $\begin{aligned} & 16 \\ & 29 \end{aligned}$ | $\begin{array}{r} 16 \\ 2 \end{array}$ | $\begin{array}{\|l} 57 \\ 13 \end{array}$ |  | 40 | $\begin{aligned} & 49 \\ & 28 \end{aligned}$ | $\begin{array}{\|c} 43 \\ 3 \end{array}$ | $\begin{array}{r} 7 \\ 36 \\ \hline \end{array}$ |  | 8 | $\begin{aligned} & 24 \\ & 27 \\ & \hline \end{aligned}$ | $\begin{array}{r} 17 \\ 4 \end{array}$ | $\begin{aligned} & 20 \\ & 28 \end{aligned}$ |  |
| 29 |  | 12 | $\begin{aligned} & 45 \\ & 30 \\ & \hline \end{aligned}$ | $\begin{aligned} & 52 \\ & 56 \\ & \hline \end{aligned}$ | $\begin{aligned} & 57 \\ & 52 \\ & \hline \end{aligned}$ |  | 43 | $\begin{array}{\|l} 14 \\ 29 \\ \hline \end{array}$ | $\begin{array}{\|l} 30 \\ 59 \\ \hline \end{array}$ | $\begin{array}{\|l} 27 \\ 20 \\ \hline \end{array}$ |  | 12 | $\begin{array}{\|l} 45 \\ 29 \\ \hline \end{array}$ | $\begin{array}{r} 19 \\ 1 \end{array}$ | $\begin{array}{\|l} 10 \\ 14 \\ \hline \end{array}$ |  | 41 | $\begin{array}{\|l} \mathbf{1 7} \\ \mathbf{2 8} \end{array}$ | $\begin{array}{r} 46 \\ 2 \end{array}$ | $\begin{array}{\|l} 43 \\ 37 \\ \hline \end{array}$ |  | 8 | $\begin{array}{\|l} \mathbf{5 1}^{1} \\ \mathbf{2 7} \\ \hline \end{array}$ | $\begin{array}{\|r} 21 \\ 3 \\ \hline \end{array}$ | $\begin{aligned} & \hline 48 \\ & 29 \end{aligned}$ |  |
| 30 | 52 | 13 | $\begin{aligned} & 16 \\ & 30 \end{aligned}$ | $\begin{array}{\|c\|} \hline 49 \\ 55 \\ \hline \end{array}$ | $\begin{gathered} 49 \\ 55 \\ \hline \end{gathered}$ | 52 | 43 | $\begin{aligned} & 44 \\ & 29 \end{aligned}$ | $\begin{aligned} & 29 \\ & 58 \\ & \hline \end{aligned}$ | $\begin{aligned} & 47 \\ & 22 \end{aligned}$ | 53 | 13 | $\begin{aligned} & 14 \\ & 29 \end{aligned}$ | $\begin{array}{r} 20 \\ 0 \end{array}$ | $\begin{aligned} & 24 \\ & 16 \end{aligned}$ | 53 | 41 | $\begin{aligned} & 45 \\ & 28 \end{aligned}$ | $\begin{gathered} 49 \\ 1 \end{gathered}$ | $\begin{aligned} & 20 \\ & 38 \\ & \hline \end{aligned}$ | 54 | 9 | $\begin{aligned} & 18 \\ & 27 \\ & \hline \end{aligned}$ | $\begin{array}{r} 25 \\ \hline 2 \\ \hline \end{array}$ | $\begin{aligned} & 17 \\ & 30 \end{aligned}$ |  |

Bürgi's 1' sine table (reconstruction, D. Roegel, 2016)

| , | $60^{\circ}$ |  |  |  |  | $61^{\circ}$ |  |  |  |  | $62^{\circ}$ |  |  |  |  | $63^{\circ}$ |  |  |  |  | $64^{\circ}$ |  |  |  |  | , |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 30 | 52 | 13 | $\begin{aligned} & 16 \\ & 30 \\ & \hline \end{aligned}$ | $\begin{aligned} & 49 \\ & 55 \\ & \hline \end{aligned}$ | $\begin{array}{\|c} 49 \\ 55 \\ \hline \end{array}$ | 52 | 43 | $\begin{aligned} & 44 \\ & 29 \end{aligned}$ | $\begin{aligned} & 29 \\ & 58 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 47 \\ 22 \end{array}$ | 53 | 13 | $\begin{array}{\|l\|} \hline 14 \\ 29 \\ \hline \end{array}$ | $\begin{array}{r} 20 \\ 0 \\ \hline \end{array}$ | $\begin{aligned} & 24 \\ & 16 \end{aligned}$ | 53 | 41 | $\begin{aligned} & 45 \\ & 28 \end{aligned}$ | $\begin{array}{r} 49 \\ 1 \end{array}$ | $\begin{aligned} & 20 \\ & 3^{8} \\ & \hline \end{aligned}$ | 54 | 9 | $\begin{aligned} & 18 \\ & 27 \\ & \hline \end{aligned}$ | $\begin{array}{r} 25 \\ \hline 2 \\ \hline \end{array}$ | $\begin{aligned} & 17 \\ & 30 \\ & \hline \end{aligned}$ | 30 |
| 31 |  | 13 | $\begin{aligned} & 47 \\ & 30 \end{aligned}$ | $\begin{aligned} & 45 \\ & 54 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 44 \\ 58 \\ \hline \end{array}$ |  | 44 | $\begin{array}{\|l} 14 \\ 29 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 28 \\ 57 \\ \hline \end{array}$ | $\begin{array}{r} 9 \\ 24 \\ \hline \end{array}$ |  | 13 | $\begin{aligned} & 43 \\ & 28 \end{aligned}$ | $\begin{array}{\|l} \hline 20 \\ 59 \\ \hline \end{array}$ | $\begin{aligned} & 40 \\ & 17 \\ & \hline \end{aligned}$ |  | 42 | $\begin{aligned} & 13 \\ & 28 \end{aligned}$ | $\begin{gathered} 50 \\ 0 \end{gathered}$ | $\begin{aligned} & 58 \\ & 39 \\ & \hline \end{aligned}$ |  | 9 | $\begin{aligned} & 45 \\ & 27 \end{aligned}$ | $\begin{array}{r} 27 \\ \hline 1 \\ \hline \end{array}$ | $\begin{aligned} & 47 \\ & 30 \\ & \hline \end{aligned}$ | 31 |
| 32 |  | 14 | $\begin{aligned} & 18 \\ & 30 \\ & \hline \end{aligned}$ | $\begin{aligned} & 40 \\ & 54 \\ & \hline \end{aligned}$ | $\begin{gathered} 42 \\ 0 \end{gathered}$ |  | 44 | $\begin{array}{\|l} 44 \\ 29 \\ \hline \end{array}$ | $\begin{aligned} & 25 \\ & 56 \\ & \hline \end{aligned}$ | $\begin{aligned} & 33 \\ & 26 \end{aligned}$ |  | 14 | $\begin{aligned} & 12 \\ & 28 \end{aligned}$ | $\begin{aligned} & 19 \\ & 58 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 57 \\ 19 \\ \hline \end{array}$ |  | 42 | $\begin{array}{\|l} \mathbf{4 1} \\ \mathbf{2 7} \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline \mathbf{5 1} \\ 59 \\ \hline \end{array}$ | $\begin{array}{\|l} 37 \\ 40 \\ \hline \end{array}$ |  | 10 | $\begin{aligned} & 12 \\ & 27 \\ & \hline \end{aligned}$ | $\begin{array}{r} 29 \\ \hline 0 \end{array}$ | $\begin{array}{\|l\|} \hline \mathbf{1 7} \\ \mathbf{3 1}^{1} \\ \hline \end{array}$ | $3^{2}$ |
| 33 |  | 14 | $\begin{aligned} & 49 \\ & 30 \end{aligned}$ | $\begin{array}{\|l} 34 \\ 53 \\ \hline \end{array}$ | $\begin{array}{\|c} \hline 42 \\ 3 \\ \hline \end{array}$ |  | 45 | $\begin{aligned} & 14 \\ & 29 \\ & \hline \end{aligned}$ | $\begin{aligned} & \hline 21 \\ & 55 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 59 \\ 28 \end{array}$ |  | 14 | $\begin{aligned} & \mathbf{4 1} \\ & \mathbf{2 8} \end{aligned}$ | $\begin{array}{\|l\|} \hline \mathbf{1 8} \\ 57 \\ \hline \end{array}$ | $\begin{aligned} & 16 \\ & 21 \end{aligned}$ |  | 43 | $\begin{array}{r} 9 \\ 27 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \mathbf{5 1} \\ 58 \\ \hline \end{array}$ | $\begin{array}{\|l} 17 \\ 4^{2} \\ \hline \end{array}$ |  | 10 | $\begin{aligned} & 39 \\ & 26 \end{aligned}$ | $\begin{array}{\|l} \hline 29 \\ 59 \\ \hline \end{array}$ | $\begin{aligned} & 48 \\ & 31 \\ & \hline \end{aligned}$ | 33 |
| 34 |  | 15 | $\begin{aligned} & 20 \\ & 30 \end{aligned}$ | $\begin{aligned} & 27 \\ & 52 \\ & \hline \end{aligned}$ | $\begin{array}{r} 45 \\ 6 \end{array}$ |  | 45 | $\begin{array}{\|l} 44 \\ 29 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{1 7} \\ & \mathbf{5 4} \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 27 \\ 31 \\ \hline \end{array}$ |  | 15 | $\begin{array}{\|l\|l\|} \hline 10 \\ 28 \end{array}$ | $\begin{aligned} & 15 \\ & 56 \\ & \hline \end{aligned}$ | $\begin{aligned} & 37 \\ & 23 \\ & \hline \end{aligned}$ |  | 43 | $\begin{array}{\|l} 37 \\ 27 \\ \hline \end{array}$ | $\begin{array}{\|} 49 \\ 57 \\ \hline \end{array}$ | $\begin{array}{\|l} 59 \\ 4^{2} \\ \hline \end{array}$ |  | 11 | $\begin{array}{r} 6 \\ 26 \end{array}$ | $\begin{array}{\|l} \hline 29 \\ 58 \\ \hline \end{array}$ | $\begin{aligned} & 19 \\ & 3^{2} \end{aligned}$ | 34 |
| 35 |  | 15 | $\begin{aligned} & \mathbf{5}^{1} \\ & 3^{0} \\ & \hline \end{aligned}$ | $\begin{aligned} & 19 \\ & 51 \\ & \hline \end{aligned}$ | $\begin{array}{r} \mathbf{5 1} \\ 9 \end{array}$ |  | 46 | $\begin{aligned} & 14 \\ & 29 \\ & \hline \end{aligned}$ | $\begin{aligned} & 11 \\ & 53 \end{aligned}$ | $\begin{aligned} & 58 \\ & 3^{2} \end{aligned}$ |  | 15 | $\begin{aligned} & 39 \\ & 28 \end{aligned}$ | $\begin{aligned} & 12 \\ & 55 \end{aligned}$ | $\begin{array}{r} 10 \\ 23 \\ \hline \end{array}$ |  | 44 | $\begin{array}{r} 5 \\ 27 \\ \hline \end{array}$ | $\begin{aligned} & 47 \\ & 56 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 41 \\ 44 \\ \hline \end{array}$ |  | 11 | $\begin{aligned} & 33 \\ & 26 \end{aligned}$ | $\begin{array}{\|} \mathbf{2 7} \\ 57 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline \mathbf{5 1} \\ 33 \end{array}$ | 35 |
| 36 |  | 16 | $\begin{aligned} & 22 \\ & 30 \end{aligned}$ | $\begin{aligned} & 11 \\ & 50 \\ & \hline \end{aligned}$ | $\begin{array}{r} 0 \\ 11 \end{array}$ |  | 46 | $\begin{aligned} & 44 \\ & 29 \end{aligned}$ | $\begin{array}{r} 5 \\ 52 \\ \hline \end{array}$ | $\begin{aligned} & 30 \\ & 35 \\ & \hline \end{aligned}$ |  | 16 | $\begin{array}{r} 8 \\ 28 \end{array}$ | $\begin{array}{r} 7 \\ 54 \\ \hline \end{array}$ | $\begin{aligned} & 23 \\ & 26 \end{aligned}$ |  | 44 | $\begin{array}{\|l} 33 \\ 27 \\ \hline \end{array}$ | $\begin{aligned} & 44 \\ & 55 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 25 \\ 44 \\ \hline \end{array}$ |  | 12 | $\begin{array}{r} \mathbf{o} \\ 26 \end{array}$ | $\begin{aligned} & 25 \\ & 56 \end{aligned}$ | $\begin{array}{\|l} 24 \\ 33 \\ \hline \end{array}$ | 36 |
| 37 |  | 16 | $\begin{aligned} & 53 \\ & 30 \end{aligned}$ | $\begin{array}{r} \hline \mathbf{1} \\ 49 \\ \hline \end{array}$ | $\begin{array}{\|l\|l\|} \hline 11 \\ 13 \\ \hline \end{array}$ |  | 47 | $\begin{array}{\|l} 13 \\ 29 \end{array}$ | $\begin{aligned} & 58 \\ & 51 \\ & \hline \end{aligned}$ | $\begin{array}{r} 5 \\ 37 \end{array}$ |  | 16 | $\begin{aligned} & 37 \\ & 28 \end{aligned}$ | $\begin{array}{r} \mathbf{1} \\ 53 \end{array}$ | $\begin{aligned} & 49 \\ & 27 \\ & \hline \end{aligned}$ |  | 45 | $\begin{array}{\|r} \mathbf{1} \\ \mathbf{2 7} \\ \hline \end{array}$ | $\begin{aligned} & 40 \\ & 54 \end{aligned}$ | $\begin{array}{r} 9 \\ 46 \\ \hline \end{array}$ |  | 12 | $\begin{aligned} & 27 \\ & 26 \end{aligned}$ | $\begin{array}{\|l} \mathbf{2 1} \\ 55 \\ \hline \end{array}$ | $\begin{array}{\|l} 57 \\ 34 \\ \hline \end{array}$ | 37 |
| $3^{8}$ |  | 17 | $\begin{aligned} & 23 \\ & 30 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 50 \\ 48 \\ \hline \end{array}$ | $\begin{array}{\|} \hline 24 \\ 17 \\ \hline \end{array}$ |  | 47 | $\begin{aligned} & 43 \\ & 29 \\ & \hline \end{aligned}$ | $\begin{aligned} & 49 \\ & 50 \\ & \hline \end{aligned}$ | $\begin{aligned} & 42 \\ & 39 \\ & \hline \end{aligned}$ |  | 17 | $\begin{array}{r} 5 \\ 28 \end{array}$ | $\begin{aligned} & 55 \\ & 52 \\ & \hline \end{aligned}$ | $\begin{aligned} & 16 \\ & 29 \\ & \hline \end{aligned}$ |  | 45 | $\begin{array}{\|l} 29 \\ 27 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{3 4} \\ & 53 \end{aligned}$ | $\begin{array}{\|l} 55 \\ 47 \\ \hline \end{array}$ |  | 12 | $\begin{aligned} & 54 \\ & 26 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline \mathbf{1 7} \\ 54 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline \mathbf{3 1} \\ 34 \\ \hline \end{array}$ | $3^{8}$ |
| 39 |  | 17 | $\begin{aligned} & 54 \\ & 30 \\ & \hline \end{aligned}$ | $\begin{aligned} & 38 \\ & 47 \end{aligned}$ | $\begin{aligned} & \mathbf{4 1} \\ & 19 \\ & \hline \end{aligned}$ |  | 48 | $\begin{array}{\|l} 13 \\ 29 \\ \hline \end{array}$ | $\begin{aligned} & 40 \\ & 49 \\ & \hline \end{aligned}$ | $\begin{aligned} & 21 \\ & 41 \end{aligned}$ |  | 17 | $\begin{array}{\|l} 34 \\ 28 \end{array}$ | $\begin{array}{\|l} 47 \\ 51 \\ \hline \end{array}$ | $\begin{aligned} & 45 \\ & 30 \\ & \hline \end{aligned}$ |  | 45 | $\begin{array}{\|l} \mathbf{5 7} \\ 27 \\ \hline \end{array}$ | $\begin{aligned} & 28 \\ & 52 \end{aligned}$ | $\begin{array}{\|l} 42 \\ 48 \\ \hline \end{array}$ |  | 13 | $\begin{aligned} & \mathbf{2 1} \\ & \mathbf{2 6} \end{aligned}$ | $\begin{array}{\|l} \mathbf{1 2} \\ 53 \\ \hline \end{array}$ | $\begin{array}{r} 5 \\ 35 \end{array}$ | 39 |
| 40 | 52 | 18 | $\begin{aligned} & 25 \\ & 30 \\ & \hline \end{aligned}$ | $\begin{aligned} & 26 \\ & 46 \\ & \hline \end{aligned}$ | $\begin{array}{r} 0 \\ 22 \end{array}$ | 52 | 48 | $\begin{aligned} & 43 \\ & 29 \end{aligned}$ | $\begin{aligned} & 30 \\ & 48 \\ & \hline \end{aligned}$ | $\begin{array}{r} 2 \\ 43 \\ \hline \end{array}$ | 53 | 18 | $\begin{array}{r} 3 \\ 28 \end{array}$ | $\begin{aligned} & 39 \\ & 50 \\ & \hline \end{aligned}$ | $\begin{aligned} & 15 \\ & 3^{2} \end{aligned}$ | 53 | 46 | $\begin{array}{\|l} 25 \\ 27 \\ \hline \end{array}$ | $\begin{aligned} & 21 \\ & 51 \\ & \hline \end{aligned}$ | $\begin{aligned} & 30 \\ & 48 \\ & \hline \end{aligned}$ | 54 | 13 | $\begin{gathered} 48 \\ 26 \end{gathered}$ | $\begin{array}{r} 5 \\ 52 \\ \hline \end{array}$ | $\begin{aligned} & 40 \\ & 35 \end{aligned}$ | 40 |
| 41 |  | 18 | $\begin{aligned} & 56 \\ & 3^{6} \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \mathbf{1 2} \\ 45 \\ \hline \end{array}$ | $\begin{array}{\|l} 22 \\ 24 \\ \hline \end{array}$ |  | 49 | $\begin{aligned} & 13 \\ & 29 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline \mathbf{1 8} \\ 47 \\ \hline \end{array}$ | $\begin{aligned} & 45 \\ & 45 \\ & \hline \end{aligned}$ |  | 18 | $\begin{aligned} & 32 \\ & 28 \end{aligned}$ | $\begin{array}{\|l} 29 \\ 49 \\ \hline \end{array}$ | $\begin{array}{\|l\|} 47 \\ 33 \\ \hline \end{array}$ |  | 46 | $\begin{array}{\|l} 53 \\ 27 \\ \hline \end{array}$ | $\begin{aligned} & 13 \\ & 50 \\ & \hline \end{aligned}$ | $\begin{aligned} & 18 \\ & 50 \\ & \hline \end{aligned}$ |  | 14 | $\begin{aligned} & 14 \\ & 26 \end{aligned}$ | $\begin{aligned} & \hline 58 \\ & 51 \\ & \hline \end{aligned}$ | $\begin{aligned} & 15 \\ & 36 \\ & \hline \end{aligned}$ | $4^{1}$ |
| 42 |  | 19 | $\begin{aligned} & 26 \\ & 30 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 57 \\ 44 \\ \hline \end{array}$ | $\begin{aligned} & 46 \\ & 27 \end{aligned}$ |  | 49 | $\begin{aligned} & 43 \\ & 29 \end{aligned}$ | $\begin{array}{r} 6 \\ 46 \end{array}$ | $\begin{aligned} & 30 \\ & 47 \end{aligned}$ |  | 19 | $\begin{array}{r} 1 \\ \mathbf{2} \end{array}$ | $\begin{array}{\|l} 19 \\ 48 \\ \hline \end{array}$ | $\begin{aligned} & 20 \\ & 35 \end{aligned}$ |  | 47 | $\begin{array}{\|l} \mathbf{2 1} \\ \mathbf{2 7} \\ \hline \end{array}$ | $\begin{array}{r} 4 \\ 49 \\ \hline \end{array}$ | $\begin{array}{r} 8 \\ 51 \end{array}$ |  | 14 | $\begin{aligned} & 41 \\ & \mathbf{2 6} \end{aligned}$ | $\begin{aligned} & 49 \\ & 50 \end{aligned}$ | $\begin{array}{\|l} \mathbf{5 1} \\ 36 \\ \hline \end{array}$ | 42 |
| 43 |  | 19 | $\begin{aligned} & 57 \\ & 30 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 42 \\ 43 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 13 \\ 30 \\ \hline \end{array}$ |  | 50 | $\begin{aligned} & 12 \\ & 29 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 53 \\ 45 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{1 7} \\ & 50 \\ & \hline \end{aligned}$ |  | 19 | $\begin{aligned} & 30 \\ & 28 \end{aligned}$ | $\begin{array}{r} 7 \\ 47 \\ \hline \end{array}$ | $\begin{aligned} & 55 \\ & 36 \end{aligned}$ |  | 47 | $\begin{aligned} & 48 \\ & 27 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 53 \\ 48 \\ \hline \end{array}$ | $\begin{aligned} & 59 \\ & 52 \\ & \hline \end{aligned}$ |  | 15 | $\begin{array}{r} 8 \\ 26 \end{array}$ | $\begin{array}{\|l} \hline \mathbf{4 0} \\ 49 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline \mathbf{2 7} \\ 37 \\ \hline \end{array}$ | 43 |
| 44 |  | 20 | $\begin{aligned} & 28 \\ & 30 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 25 \\ 4^{2} \\ \hline \end{array}$ | $\begin{aligned} & 43 \\ & 32 \\ & \hline \end{aligned}$ |  | 50 | $\begin{aligned} & 42 \\ & 29 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 39 \\ 44 \\ \hline \end{array}$ | $\begin{array}{r} 7 \\ 51 \\ \hline \end{array}$ |  | 19 | $\begin{aligned} & 58 \\ & 28 \end{aligned}$ | $\begin{array}{\|l} 55 \\ 46 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{3 1} \\ & 38 \\ & \hline \end{aligned}$ |  | 48 | $\begin{array}{\|l} \hline 16 \\ \mathbf{2 7} \\ \hline \end{array}$ | $\begin{aligned} & 42 \\ & 47 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \mathbf{5 1} \\ 53 \\ \hline \end{array}$ |  | 15 | $\begin{aligned} & 35 \\ & 26 \end{aligned}$ | $\begin{array}{\|l} \hline 30 \\ 48 \\ \hline \end{array}$ | $\begin{array}{r} 4 \\ 37 \\ \hline \end{array}$ | 44 |
| 45 |  | 20 | $\begin{aligned} & 59 \\ & 30 \\ & \hline \end{aligned}$ | $\begin{array}{r} 8 \\ 41 \\ \hline \end{array}$ | $\begin{aligned} & \hline 15 \\ & 35 \\ & \hline \end{aligned}$ |  | 51 | $\begin{aligned} & 12 \\ & 29 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 23 \\ 43 \\ \hline \end{array}$ | $\begin{aligned} & 58 \\ & 53 \end{aligned}$ |  | 20 | $\begin{aligned} & 27 \\ & 28 \end{aligned}$ | $\begin{array}{\|l} 42 \\ 45 \\ \hline \end{array}$ | $\begin{array}{r} 9 \\ 40 \\ \hline \end{array}$ |  | 48 | $\begin{array}{\|l} 44 \\ 27 \\ \hline \end{array}$ | $\begin{aligned} & 30 \\ & 46 \end{aligned}$ | $\begin{array}{\|} 44 \\ 54 \\ \hline \end{array}$ |  | 16 | $\begin{array}{r} 2 \\ 26 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline \mathbf{1 8} \\ 47 \\ \hline \end{array}$ | $\begin{array}{\|l} \mathbf{4 1} \\ 38 \\ \hline \end{array}$ | 45 |
| 46 |  | 21 | $\begin{aligned} & 29 \\ & 30 \\ & \hline \end{aligned}$ | $\begin{aligned} & 49 \\ & 40 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 50 \\ 37 \\ \hline \end{array}$ |  | 51 | $\begin{array}{\|l} 42 \\ 29 \\ \hline \end{array}$ | $\begin{array}{r} 7 \\ 42 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline \mathbf{5 1} \\ 56 \end{array}$ |  | 20 | $\begin{aligned} & 56 \\ & 28 \end{aligned}$ | $\begin{array}{\|} 27 \\ 44 \\ \hline \end{array}$ | $\begin{aligned} & 49 \\ & 40 \end{aligned}$ |  | 49 | $\begin{array}{\|l} 12 \\ \mathbf{2 7} \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{1 7} \\ & \mathbf{4 5} \end{aligned}$ | $\begin{aligned} & 38 \\ & 54 \\ & \hline \end{aligned}$ |  | 16 | $\begin{aligned} & 29 \\ & 26 \end{aligned}$ | $\begin{array}{r} 6 \\ 46 \\ \hline \end{array}$ | $\begin{aligned} & 19 \\ & 38 \\ & \hline \end{aligned}$ | 46 |
| 47 |  | 22 | $\begin{array}{r} \mathbf{o} \\ 30 \\ \hline \end{array}$ | $\begin{aligned} & 30 \\ & 39 \\ & \hline \end{aligned}$ | $\begin{aligned} & 27 \\ & 40 \\ & \hline \end{aligned}$ |  | 52 | $\begin{aligned} & 11 \\ & 29 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 50 \\ 41 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 47 \\ 57 \\ \hline \end{array}$ |  | 21 | $\begin{aligned} & 25 \\ & 28 \end{aligned}$ | $\begin{array}{\|l\|} \mathbf{1 2} \\ 43 \\ \hline \end{array}$ | $\begin{aligned} & \hline 29 \\ & 43 \\ & \hline \end{aligned}$ |  | 49 | $\begin{aligned} & 40 \\ & 27 \\ & \hline \end{aligned}$ | $\begin{array}{r} 3 \\ 44 \\ \hline \end{array}$ | $\begin{aligned} & 32 \\ & 5^{2} \\ & \hline \end{aligned}$ |  | 16 | $\begin{aligned} & 55 \\ & 26 \end{aligned}$ | $\begin{array}{\|l} \hline 52 \\ 45 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 57 \\ 39 \\ \hline \end{array}$ | 47 |
| 48 |  | 22 | $\begin{aligned} & \mathbf{3 1} \\ & 30 \end{aligned}$ | $\begin{aligned} & 10 \\ & 38 \end{aligned}$ | $\begin{array}{r} 7 \\ 43 \\ \hline \end{array}$ |  | 52 | $\begin{aligned} & 41 \\ & \mathbf{2 9} \end{aligned}$ | $\begin{aligned} & 32 \\ & 41 \end{aligned}$ | $\begin{gathered} 44 \\ 0 \end{gathered}$ |  | 21 | $\begin{aligned} & 53 \\ & 28 \end{aligned}$ | $\begin{aligned} & 56 \\ & 42 \end{aligned}$ | $\begin{array}{\|l} 12 \\ 44 \\ \hline \end{array}$ |  | 50 | $\begin{array}{r} 7 \\ 27 \\ \hline \end{array}$ | $\begin{aligned} & 48 \\ & 43 \end{aligned}$ | $\begin{aligned} & \mathbf{2 8} \\ & 57 \end{aligned}$ |  | 17 | $\begin{aligned} & 22 \\ & 26 \end{aligned}$ | $\begin{array}{\|l} \hline 38 \\ 44 \\ \hline \end{array}$ | $\begin{aligned} & 36 \\ & 39 \end{aligned}$ | 48 |
| 49 |  | 23 | $\begin{array}{r} 1 \\ 30 \\ \hline \end{array}$ | $\begin{aligned} & 48 \\ & 37 \end{aligned}$ | $\begin{array}{\|l\|} \hline 50 \\ 45 \\ \hline \end{array}$ |  | 53 | $\begin{array}{\|l} 11 \\ 29 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 13 \\ 40 \\ \hline \end{array}$ | $\begin{array}{r} 44 \\ 1 \end{array}$ |  | 22 | $\begin{aligned} & 22 \\ & 28 \end{aligned}$ | $\begin{array}{\|l\|} \hline 38 \\ 41 \\ \hline \end{array}$ | $\begin{aligned} & 56 \\ & 45 \\ & \hline \end{aligned}$ |  | 50 | $\begin{aligned} & 35 \\ & 27 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 32 \\ 42 \\ \hline \end{array}$ | $\begin{aligned} & 25 \\ & 58 \\ & \hline \end{aligned}$ |  | 17 | $\begin{aligned} & 49 \\ & 26 \end{aligned}$ | $\begin{array}{\|l} \hline 23 \\ 43 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 15 \\ 40 \\ \hline \end{array}$ | 49 |
| 50 | 52 | 23 | $\begin{aligned} & \mathbf{3 2}^{2} \\ & 3^{0} \end{aligned}$ | $\begin{aligned} & 26 \\ & 36 \end{aligned}$ | $\begin{aligned} & 35 \\ & 48 \end{aligned}$ | 52 | 53 | $\begin{aligned} & 40 \\ & 29 \\ & \hline \end{aligned}$ | $\begin{aligned} & 53 \\ & 39 \end{aligned}$ | $\begin{array}{r} 45 \\ 4 \end{array}$ | 53 | 22 | $\begin{aligned} & \mathbf{5 1} \\ & \mathbf{2 8} \end{aligned}$ | $\begin{aligned} & 20 \\ & 40 \\ & \hline \end{aligned}$ | $\begin{aligned} & \mathbf{4 1} \\ & 47 \end{aligned}$ | 53 | 51 | $\begin{array}{r} 3 \\ 27 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 15 \\ 41 \\ \hline \end{array}$ | $\begin{array}{\|l} 23 \\ 58 \\ \hline \end{array}$ | 54 | 18 | $\begin{aligned} & 16 \\ & 26 \end{aligned}$ | $\begin{array}{r} 6 \\ 42 \\ \hline \end{array}$ | $\begin{array}{\|l} 55 \\ 40 \\ \hline \end{array}$ | 50 |
| 51 |  | 24 | $\begin{array}{r} 3 \\ 30 \\ \hline \end{array}$ | $\begin{array}{r} 3 \\ 35 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 23 \\ 50 \\ \hline \end{array}$ |  | 54 | $\begin{array}{\|l} 10 \\ 29 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 32 \\ 38 \\ \hline \end{array}$ | $\begin{array}{r} 49 \\ 5 \\ \hline \end{array}$ |  | 23 | $\begin{aligned} & 20 \\ & 28 \end{aligned}$ | $\begin{array}{r} \mathbf{1} \\ 39 \\ \hline \end{array}$ | $\begin{aligned} & 28 \\ & 48 \\ & \hline \end{aligned}$ |  | 51 | $\begin{array}{\|l} 30 \\ 27 \\ \hline \end{array}$ | $\begin{array}{\|l} 57 \\ 41 \\ \hline \end{array}$ | $\begin{array}{r} 21 \\ 0 \end{array}$ |  | 18 | $\begin{aligned} & 42 \\ & 26 \end{aligned}$ | $\begin{array}{\|l} \hline 49 \\ 41 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 35 \\ 41 \\ \hline \end{array}$ | 51 |
| 52 |  | 24 | $\begin{aligned} & 33 \\ & 30 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 39 \\ 34 \end{array}$ | $13$ |  | 54 | $\begin{aligned} & 40 \\ & 29 \end{aligned}$ | $\begin{aligned} & 10 \\ & 37 \end{aligned}$ | $\begin{array}{r} 54 \\ 8 \end{array}$ |  | 23 | $\begin{aligned} & 48 \\ & 28 \end{aligned}$ | $\begin{aligned} & 41 \\ & 38 \end{aligned}$ | $\begin{aligned} & 16 \\ & 50 \end{aligned}$ |  | 51 | $\begin{aligned} & 58 \\ & 27 \end{aligned}$ | $\begin{aligned} & 38 \\ & 40 \end{aligned}$ | $\begin{array}{r} 21 \\ 0 \end{array}$ |  | 19 | $\begin{array}{\|r} 9 \\ 26 \end{array}$ | $\begin{aligned} & 31 \\ & 40 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 16 \\ 41 \\ \hline \end{array}$ | 52 |
| 53 |  | 25 | $\begin{array}{r} 4 \\ 30 \\ \hline \end{array}$ | $\begin{array}{\|l} 14 \\ 33 \\ \hline \end{array}$ | $\begin{array}{r} 5 \\ 56 \\ \hline \end{array}$ |  | 55 | $\begin{array}{r} 9 \\ 29 \\ \hline \end{array}$ | $\begin{aligned} & 48 \\ & 36 \end{aligned}$ | $\begin{aligned} & \hline 2 \\ & 9 \\ & \hline \end{aligned}$ |  | 24 | $\begin{aligned} & \mathbf{1 7} \\ & \mathbf{2 8} \end{aligned}$ | $\begin{aligned} & 20 \\ & 37 \\ & \hline \end{aligned}$ | $\begin{array}{r} 6 \\ 51 \\ \hline \end{array}$ |  | 52 | $\begin{aligned} & 26 \\ & 27 \\ & \hline \end{aligned}$ | $\begin{aligned} & \mathbf{1 8} \\ & 39 \end{aligned}$ | $\begin{array}{r} 21 \\ 2 \end{array}$ |  | 19 | $\begin{aligned} & 36 \\ & 26 \end{aligned}$ | $\begin{array}{\|l\|} \hline \mathbf{1 1} \\ 39 \\ \hline \end{array}$ | $\begin{array}{\|l} 57 \\ 41 \\ \hline \end{array}$ | 53 |
| 54 |  | 25 | $\begin{aligned} & 34 \\ & 30 \end{aligned}$ | $\begin{aligned} & 4^{8} \\ & 3^{2} \end{aligned}$ | $\begin{array}{\|r} \hline \mathbf{1} \\ 57 \\ \hline \end{array}$ |  | 55 | $\begin{aligned} & 39 \\ & 29 \end{aligned}$ | $\begin{array}{\|l} 24 \\ 35 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 11 \\ 11 \\ \hline \end{array}$ |  | 24 | $\begin{aligned} & 45 \\ & 28 \end{aligned}$ | $\begin{aligned} & 57 \\ & 36 \\ & \hline \end{aligned}$ | $\begin{aligned} & 57 \\ & 52 \\ & \hline \end{aligned}$ |  | 52 | $\begin{aligned} & 53 \\ & 27 \\ & \hline \end{aligned}$ | $\begin{array}{\|} 57 \\ 38 \\ \hline \end{array}$ | $\begin{array}{r} 23 \\ 2 \end{array}$ |  | 20 | $\begin{array}{r} 2 \\ 26 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline \mathbf{5 1} \\ 38 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 38 \\ 4^{2} \\ \hline \end{array}$ | 54 |
| 55 |  | 26 | $\begin{array}{r} 5 \\ 30 \\ \hline \end{array}$ | $\begin{aligned} & 20 \\ & 32 \\ & \hline \end{aligned}$ | $58$ |  | 56 | $\begin{array}{r} 8 \\ 29 \\ \hline \end{array}$ | $\begin{aligned} & 59 \\ & 34 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 22 \\ 14 \\ \hline \end{array}$ |  | 25 | $\begin{aligned} & 14 \\ & 28 \end{aligned}$ | $\begin{array}{\|l\|} \hline \mathbf{3 4} \\ 35 \\ \hline \end{array}$ | $\begin{aligned} & 49 \\ & 54 \\ & \hline \end{aligned}$ |  | 53 | $\begin{aligned} & 21 \\ & 27 \end{aligned}$ | $\begin{aligned} & 35 \\ & 37 \\ & \hline \end{aligned}$ | $\begin{array}{r} 25 \\ \hline 4 \\ \hline \end{array}$ |  | 20 | $\begin{aligned} & 29 \\ & 26 \end{aligned}$ | $\begin{array}{\|l} \hline 30 \\ 37 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 20 \\ 42 \\ \hline \end{array}$ | 55 |
| 56 |  | 26 | $\begin{aligned} & 35 \\ & 30 \end{aligned}$ | $\begin{aligned} & 5^{2} \\ & 3^{1} \\ & \hline \end{aligned}$ | $\begin{array}{r} 59 \\ 2 \end{array}$ |  | 56 | $\begin{aligned} & 38 \\ & 29 \end{aligned}$ | $\begin{aligned} & 33 \\ & 33 \\ & \hline \end{aligned}$ | $\begin{aligned} & 36 \\ & 15 \end{aligned}$ |  | 25 | $\begin{aligned} & 43 \\ & 28 \end{aligned}$ | $\begin{aligned} & 10 \\ & 34 \\ & \hline \end{aligned}$ | $\begin{aligned} & 43 \\ & 56 \\ & \hline \end{aligned}$ |  | 53 | $\begin{array}{\|l} 49 \\ 27 \\ \hline \end{array}$ | $\begin{aligned} & 12 \\ & 36 \\ & \hline \end{aligned}$ | $\begin{array}{r} 29 \\ 4 \\ \hline \end{array}$ |  | 20 | $\begin{aligned} & 56 \\ & 26 \end{aligned}$ | $\begin{array}{\|r} \hline 8 \\ 3^{6} \\ \hline \end{array}$ | $\begin{array}{\|r} \hline \mathbf{2} \\ 43 \\ \hline \end{array}$ | 56 |
| 57 |  | 27 | $\begin{array}{r} 6 \\ 30 \\ \hline \end{array}$ | $\begin{aligned} & 24 \\ & 30 \\ & \hline \end{aligned}$ | $\begin{aligned} & \mathbf{1} \\ & 5 \\ & \hline \end{aligned}$ |  | 57 | $\begin{array}{r} 8 \\ 29 \\ \hline \end{array}$ | $\begin{array}{r} 6 \\ 3^{2} \\ \hline \end{array}$ | $\begin{array}{\|l} \mathbf{5 1} \\ \mathbf{1 7} \\ \hline \end{array}$ |  | 26 | $\left\lvert\, \begin{aligned} & 11 \\ & 28 \end{aligned}\right.$ | $\begin{aligned} & 45 \\ & 33 \end{aligned}$ | $\begin{array}{\|l} 39 \\ 57 \\ \hline \end{array}$ |  | 54 | $\begin{aligned} & 16 \\ & 27 \\ & \hline \end{aligned}$ | $\begin{aligned} & 48 \\ & 35 \end{aligned}$ | $\begin{array}{r} 33 \\ 5 \\ \hline \end{array}$ |  | 21 | $\begin{aligned} & 22 \\ & 26 \end{aligned}$ | $\begin{aligned} & 44 \\ & 35 \\ & \hline \end{aligned}$ | $\begin{aligned} & 45 \\ & 43 \\ & \hline \end{aligned}$ | 57 |
| 58 |  | 27 | $\begin{aligned} & 3^{6} \\ & 3^{\mathrm{o}} \\ & \hline \end{aligned}$ | $\begin{aligned} & 54 \\ & 29 \\ & \hline \end{aligned}$ | $\begin{aligned} & 6 \\ & 8 \end{aligned}$ |  | 57 | $\begin{aligned} & 37 \\ & 29 \\ & \hline \end{aligned}$ | $\begin{aligned} & 39 \\ & 31 \\ & \hline \end{aligned}$ | $\begin{array}{r} 8 \\ 19 \\ \hline \end{array}$ |  | 26 | $\begin{aligned} & 40 \\ & 28 \end{aligned}$ | $\begin{aligned} & 19 \\ & 3^{2} \end{aligned}$ | $\begin{aligned} & 36 \\ & 58 \\ & \hline \end{aligned}$ |  | 54 | $\begin{aligned} & 44 \\ & 27 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 23 \\ 34 \\ \hline \end{array}$ | $\begin{array}{r} 38 \\ 6 \end{array}$ |  | 21 | $\begin{aligned} & 49 \\ & 26 \end{aligned}$ | $\begin{array}{\|l\|} \hline 20 \\ 34 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{2 8} \\ & 43 \end{aligned}$ | 58 |
| 59 |  | 28 | $\begin{array}{r} 7 \\ 30 \\ \hline \end{array}$ | $\begin{array}{\|l} 23 \\ 28 \end{array}$ | $\left(\begin{array}{l} 14 \\ 10 \end{array}\right.$ |  | 58 | $\begin{array}{r} 7 \\ 29 \\ \hline \end{array}$ | $\begin{aligned} & 10 \\ & 30 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 27 \\ 21 \end{array}$ |  | 27 | $\begin{array}{r} 8 \\ 28 \end{array}$ | $\begin{array}{\|l} 52 \\ 31 \\ \hline \end{array}$ | $\begin{array}{\|l} \mathbf{3 4} \\ 59 \\ \hline \end{array}$ |  | 55 | $\begin{array}{\|l\|l\|} \mathbf{1 1} \\ \mathbf{2 7} \\ \hline \end{array}$ | $\begin{array}{\|l} 57 \\ 33 \\ \hline \end{array}$ | $\begin{array}{r} 44 \\ \hline \end{array}$ |  | 22 | $\begin{aligned} & 15 \\ & 26 \end{aligned}$ | $\begin{array}{\|l} 55 \\ 33 \end{array}$ | $\begin{array}{\|l\|} \mathbf{1 1} \\ 44 \\ \hline \end{array}$ | 59 |
| 60 | 52 | 28 | $\begin{aligned} & 37 \\ & 30 \end{aligned}$ | $\begin{aligned} & \mathbf{5 1} \\ & \mathbf{2 7} \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 24 \\ 13 \\ \hline \end{array}$ | 52 | 58 | $\begin{aligned} & 36 \\ & 29 \end{aligned}$ | $\begin{aligned} & 40 \\ & 29 \end{aligned}$ | $\begin{aligned} & 48 \\ & 23 \end{aligned}$ | 53 | 27 | $\begin{aligned} & 37 \\ & 28 \end{aligned}$ | $\begin{aligned} & 24 \\ & 31 \\ & \hline \end{aligned}$ | $\begin{array}{r} 33 \\ 1 \end{array}$ | 53 | 55 | $\begin{aligned} & 39 \\ & 27 \\ & \hline \end{aligned}$ | $\begin{aligned} & 30 \\ & 32 \end{aligned}$ | $\begin{array}{r} 50 \\ 8 \\ \hline \end{array}$ | 54 | 22 | $\begin{aligned} & 42 \\ & 26 \end{aligned}$ | $\begin{aligned} & 28 \\ & 32 \\ & \hline \end{aligned}$ | $55$ | 60 |

Bürgi's 1' sine table (reconstruction, D. Roegel, 2016)

| , | $65^{\circ}$ |  |  |  |  | $66^{\circ}$ |  |  |  |  | $67^{\circ}$ |  |  |  |  | $68^{\circ}$ |  |  |  |  | $69^{\circ}$ |  |  |  |  | , |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 0 | 54 | 22 | $\begin{aligned} & 42 \\ & 26 \end{aligned}$ | $\begin{array}{\|l\|} \hline 28 \\ 32 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 55 \\ 44 \end{array}$ | 54 | 48 | $\begin{aligned} & 45 \\ & 25 \\ & \hline \end{aligned}$ | $\begin{aligned} & 49 \\ & 32 \end{aligned}$ | $\begin{array}{r} 8 \\ 51 \\ \hline \end{array}$ | 55 | 13 | $\begin{aligned} & 49 \\ & 24 \\ & \hline \end{aligned}$ | $\begin{array}{r} 2 \\ 32 \\ \hline \end{array}$ | $\begin{aligned} & 54 \\ & 31 \end{aligned}$ | 55 | 37 | $\begin{array}{l\|} \mathbf{5 1} \\ \mathbf{2 3} \end{array}$ | $\begin{aligned} & \mathbf{4 2}^{2} \\ & 3^{1} \end{aligned}$ | $\begin{aligned} & 45 \\ & 44 \end{aligned}$ | 56 | 0 | $\begin{array}{\|l} 53 \\ 22 \end{array}$ | $\begin{aligned} & 22 \\ & 30 \\ & \hline \end{aligned}$ | $\begin{aligned} & 20 \\ & 30 \end{aligned}$ | 0 |
| 1 |  | 23 | $\begin{array}{r\|} \hline 9 \\ 26 \\ \hline \end{array}$ | $\begin{array}{r} 1 \\ 31 \\ \hline \end{array}$ | $\begin{array}{\|l} 39 \\ 45 \\ \hline \end{array}$ |  | 49 | $\begin{aligned} & 11 \\ & 25 \\ & \hline \end{aligned}$ | $\begin{aligned} & 21 \\ & 31 \\ & \hline \end{aligned}$ | $\begin{aligned} & 59 \\ & 52 \\ & \hline \end{aligned}$ |  | 14 | $\begin{aligned} & \hline 13 \\ & 24 \\ & \hline \end{aligned}$ | $\begin{aligned} & 35 \\ & 3^{1} \end{aligned}$ | $\begin{aligned} & 25 \\ & 30 \\ & \hline \end{aligned}$ |  | 38 | $\begin{aligned} & 15 \\ & 23 \end{aligned}$ | $\begin{aligned} & 14 \\ & 30 \\ & \hline \end{aligned}$ | $\begin{aligned} & 29 \\ & 4^{2} \\ & \hline \end{aligned}$ |  | 1 | $\begin{aligned} & 15 \\ & 22 \end{aligned}$ | $\begin{aligned} & 52 \\ & 29 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 50 \\ 29 \\ \hline \end{array}$ | 1 |
| 2 |  | 23 | $\begin{array}{\|l\|} \hline 35 \\ 26 \\ \hline \end{array}$ | $\begin{aligned} & 33 \\ & 30 \end{aligned}$ | $\begin{array}{\|l\|} \hline 24 \\ 45 \\ \hline \end{array}$ |  | 49 | $\begin{aligned} & 36 \\ & 25 \end{aligned}$ | $\begin{aligned} & 53 \\ & 30 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 51 \\ 51 \\ \hline \end{array}$ |  | 14 | $\begin{aligned} & 38 \\ & 24 \\ & \hline \end{aligned}$ | $\begin{array}{\|r\|} \hline 6 \\ 30 \\ \hline \end{array}$ | $\begin{aligned} & 55 \\ & 30 \\ & \hline \end{aligned}$ |  | $3^{8}$ | $\begin{aligned} & 38 \\ & 23 \\ & \hline \end{aligned}$ | $\begin{aligned} & 45 \\ & 29 \end{aligned}$ | $\begin{aligned} & 11 \\ & 42 \\ & \hline \end{aligned}$ |  | 1 | $\begin{aligned} & 3^{8} \\ & 22 \end{aligned}$ | $\left\|\begin{array}{l} 22 \\ 28 \end{array}\right\|$ | $\begin{array}{\|l\|} \hline 19 \\ 27 \\ \hline \end{array}$ | 2 |
| 3 |  | 24 | $\begin{array}{r} 2 \\ 26 \\ \hline \end{array}$ | $\begin{array}{r} 4 \\ 29 \\ \hline \end{array}$ | $\begin{array}{r} 9 \\ 45 \\ \hline \end{array}$ |  | 50 | $\begin{array}{r} 2 \\ 25 \\ \hline \end{array}$ | $\begin{aligned} & 24 \\ & 29 \\ & \hline \end{aligned}$ | $\begin{aligned} & 42 \\ & 52 \\ & \hline \end{aligned}$ |  | 15 | $\begin{array}{r} 2 \\ 24 \\ \hline \end{array}$ | $\begin{aligned} & 37 \\ & 29 \\ & \hline \end{aligned}$ | $\begin{aligned} & 25 \\ & 30 \\ & \hline \end{aligned}$ |  | 39 | $\begin{array}{r} 2 \\ 23 \\ \hline \end{array}$ | $\begin{aligned} & 14 \\ & 28 \end{aligned}$ | $\begin{array}{\|l} 53 \\ 40 \\ \hline \end{array}$ |  | 2 | $\begin{array}{r} 0 \\ 22 \\ \hline \end{array}$ | $\begin{aligned} & 50 \\ & 27 \\ & \hline \end{aligned}$ | $\begin{aligned} & 46 \\ & 26 \end{aligned}$ | 3 |
| 4 |  | 24 | $\begin{array}{\|l\|} \hline 28 \\ 26 \end{array}$ | $\begin{aligned} & 33 \\ & 28 \end{aligned}$ | $\begin{aligned} & 54 \\ & 46 \\ & \hline \end{aligned}$ |  | 50 | $\begin{array}{\|l} 27 \\ 25 \\ \hline \end{array}$ | $\begin{array}{\|l} 54 \\ 28 \end{array}$ | $\begin{array}{\|l} 34 \\ 51 \\ \hline \end{array}$ |  | 15 | $\begin{aligned} & 27 \\ & 24 \\ & \hline \end{aligned}$ | $\begin{array}{\|r\|} \hline 6 \\ 28 \\ \hline \end{array}$ | $\begin{aligned} & 55 \\ & 28 \end{aligned}$ |  | 39 | $\begin{aligned} & 25 \\ & 23 \end{aligned}$ | $\begin{array}{\|l} 43 \\ 27 \\ \hline \end{array}$ | $\begin{array}{\|l} 33 \\ 40 \\ \hline \end{array}$ |  | 2 | $\begin{aligned} & 23 \\ & 22 \end{aligned}$ | $\begin{aligned} & 18 \\ & 26 \end{aligned}$ | $\begin{array}{\|l} \hline 12 \\ 24 \\ \hline \end{array}$ | 4 |
| 5 |  | 24 | $\begin{array}{\|l\|} \hline 55 \\ 26 \end{array}$ | $\begin{array}{\|r\|} \hline 2 \\ 27 \\ \hline \end{array}$ | $\begin{aligned} & 40 \\ & 46 \\ & \hline \end{aligned}$ |  | 50 | $\begin{aligned} & 53 \\ & 25 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 23 \\ 27 \end{array}$ | $\begin{aligned} & 25 \\ & 51 \\ & \hline \end{aligned}$ |  | 15 | $\begin{aligned} & \mathbf{5 1} \\ & 24 \\ & \hline \end{aligned}$ | $\begin{aligned} & 35 \\ & 27 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 23 \\ 28 \end{array}$ |  | 39 | $\begin{aligned} & 49 \\ & 23 \end{aligned}$ | $\begin{aligned} & \mathbf{1 1} \\ & \mathbf{2 6} \end{aligned}$ | $\begin{array}{\|l} \hline 13 \\ 38 \\ \hline \end{array}$ |  | 2 | $\begin{aligned} & 45 \\ & 22 \end{aligned}$ | $\begin{aligned} & 44 \\ & 25 \\ & \hline \end{aligned}$ | $\begin{aligned} & 36 \\ & 23 \\ & \hline \end{aligned}$ | 5 |
| 6 |  | 25 | $\begin{aligned} & 21 \\ & 26 \end{aligned}$ | $\begin{aligned} & 30 \\ & 26 \end{aligned}$ | $\begin{aligned} & 26 \\ & 46 \end{aligned}$ |  | 51 | $\begin{aligned} & 18 \\ & 25 \end{aligned}$ | $\begin{aligned} & \mathbf{5 1} \\ & 26 \end{aligned}$ | $\begin{aligned} & 16 \\ & 50 \end{aligned}$ |  | 16 | $\begin{aligned} & 16 \\ & 24 \end{aligned}$ | $\begin{array}{r} 2 \\ 26 \end{array}$ | $\begin{aligned} & \mathbf{5 1} \\ & \mathbf{2 8} \end{aligned}$ |  | 40 | $\begin{aligned} & 12 \\ & 23 \end{aligned}$ | $\begin{aligned} & 37 \\ & 25 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \mathbf{5 1} \\ \mathbf{3 7} \\ \hline \end{array}$ |  | 3 | $\begin{array}{r} 8 \\ 22 \end{array}$ | $\begin{array}{r} 9 \\ 24 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 59 \\ 22 \end{array}$ | 6 |
| 7 |  | 25 | $\begin{array}{\|l\|} \hline 47 \\ 26 \end{array}$ | $\begin{aligned} & 57 \\ & 25 \\ & \hline \end{aligned}$ | $\begin{aligned} & 12 \\ & 46 \end{aligned}$ |  | 51 | $\begin{array}{\|l} 44 \\ 25 \\ \hline \end{array}$ | $\begin{aligned} & 18 \\ & 25 \\ & \hline \end{aligned}$ | $\begin{array}{r} 6 \\ 51 \end{array}$ |  | 16 | $\begin{aligned} & 40 \\ & 24 \end{aligned}$ | $\begin{aligned} & 29 \\ & 25 \end{aligned}$ | $\begin{aligned} & 19 \\ & 27 \\ & \hline \end{aligned}$ |  | 40 | $\begin{aligned} & 36 \\ & 23 \end{aligned}$ | $\begin{array}{r} 3 \\ 24 \\ \hline \end{array}$ | $\begin{aligned} & 28 \\ & 37 \end{aligned}$ |  | 3 | $\begin{aligned} & 30 \\ & 22 \end{aligned}$ | $\begin{array}{\|l} 34 \\ 23 \\ \hline \end{array}$ | $\begin{array}{\|l} 21 \\ 20 \end{array}$ | 7 |
| 8 |  | 26 | $\left\lvert\, \begin{array}{l\|} 14 \\ 26 \end{array}\right.$ | $\begin{aligned} & 22 \\ & 24 \\ & \hline \end{aligned}$ | $\begin{aligned} & 58 \\ & 47 \end{aligned}$ |  | 52 | $\begin{array}{r} 9 \\ 25 \end{array}$ | $\begin{array}{\|l} 43 \\ 24 \end{array}$ | $\begin{aligned} & 57 \\ & 50 \\ & \hline \end{aligned}$ |  | 17 | $\begin{array}{r} 4 \\ 24 \end{array}$ | $\begin{array}{\|} 54 \\ 24 \\ \hline \end{array}$ | $\begin{aligned} & 46 \\ & 26 \end{aligned}$ |  | 40 | $\begin{aligned} & 59 \\ & 23 \\ & \hline \end{aligned}$ | $\begin{aligned} & 28 \\ & 23 \end{aligned}$ | $\begin{array}{r} 5 \\ 35 \\ \hline \end{array}$ |  | 3 | $\begin{aligned} & 5^{2} \\ & 22 \end{aligned}$ | $\begin{aligned} & 57 \\ & 22 \end{aligned}$ | $\begin{array}{\|l} 41 \\ 18 \end{array}$ | 8 |
| 9 |  | 26 | $\begin{aligned} & 40 \\ & 26 \end{aligned}$ | $\begin{aligned} & 47 \\ & 23 \\ & \hline \end{aligned}$ | $\begin{aligned} & 45 \\ & 47 \\ & \hline \end{aligned}$ |  | 52 | $\begin{aligned} & 35 \\ & 25 \\ & \hline \end{aligned}$ | $\begin{array}{r} 8 \\ 23 \end{array}$ | $\begin{array}{\|l} 47 \\ 51 \\ \hline \end{array}$ |  | 17 | $\begin{aligned} & 29 \\ & 24 \end{aligned}$ | $\begin{array}{\|l} 19 \\ 23 \\ \hline \end{array}$ | $\begin{array}{\|l} 12 \\ 25 \\ \hline \end{array}$ |  | 41 | $\begin{aligned} & 22 \\ & 23 \\ & \hline \end{aligned}$ | $\begin{aligned} & 51 \\ & 22 \end{aligned}$ | $\begin{aligned} & 40 \\ & 34 \end{aligned}$ |  | 4 | $\left\lvert\, \begin{aligned} & 15 \\ & 22 \end{aligned}\right.$ | $\begin{array}{\|l} 19 \\ 21 \end{array}$ | $\begin{array}{\|l} 59 \\ 17 \\ \hline \end{array}$ | 9 |
| 10 | 54 | 27 | $\begin{array}{r\|} 7 \\ 26 \end{array}$ | $\begin{aligned} & 11 \\ & 22 \end{aligned}$ | $\begin{aligned} & 32 \\ & 48 \\ & \hline \end{aligned}$ | 54 | 53 | $\begin{array}{r} \mathbf{0} \\ 25 \\ \hline \end{array}$ | $\begin{aligned} & 32 \\ & 22 \end{aligned}$ | $\begin{aligned} & 3^{8} \\ & 50 \end{aligned}$ | 55 | 17 | $\begin{aligned} & 53 \\ & 24 \\ & \hline \end{aligned}$ | $\begin{aligned} & 42 \\ & 22 \end{aligned}$ | $\begin{aligned} & 37 \\ & 25 \\ & \hline \end{aligned}$ | 55 | 41 | $\begin{aligned} & 46 \\ & 23 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} 14 \\ 21 \end{array}$ | $\begin{array}{\|l} \mathbf{1 4} \\ 33 \\ \hline \end{array}$ | 56 | 4 | $\begin{aligned} & 37 \\ & 22 \end{aligned}$ | $\begin{gathered} \mathbf{4 1} \\ \mathbf{2 0} \end{gathered}$ | $\begin{aligned} & \hline 16 \\ & 16 \end{aligned}$ | 10 |
| 11 |  | 27 | $\begin{array}{\|l\|} \hline 33 \\ 26 \\ \hline \end{array}$ | $\begin{aligned} & \hline 34 \\ & 21 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 20 \\ 47 \\ \hline \end{array}$ |  | 53 | $\begin{aligned} & 25 \\ & 25 \end{aligned}$ | $\begin{aligned} & 55 \\ & 21 \end{aligned}$ | $\begin{aligned} & 28 \\ & 50 \\ & \hline \end{aligned}$ |  | 18 | $\begin{aligned} & 18 \\ & 24 \\ & \hline \end{aligned}$ | $\begin{array}{r} 5 \\ 21 \end{array}$ | $\begin{array}{r} 2 \\ 25 \\ \hline \end{array}$ |  | 42 | $\begin{array}{r} 9 \\ 23 \\ \hline \end{array}$ | $\begin{aligned} & 35 \\ & 20 \end{aligned}$ | $\begin{aligned} & 47 \\ & 3^{2} \end{aligned}$ |  | 5 | $\begin{array}{r} \mathbf{0} \\ 22 \\ \hline \end{array}$ | $\begin{array}{\|r} \mathbf{1} \\ 19 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 3^{2} \\ 14 \\ \hline \end{array}$ | 11 |
| 12 |  | 27 | $\begin{array}{\|l\|} \hline 59 \\ 26 \end{array}$ | $\begin{aligned} & 56 \\ & 20 \end{aligned}$ | $\begin{array}{r} 7 \\ 48 \end{array}$ |  | 53 | $\begin{array}{\|l} 5^{1} \\ 25 \end{array}$ | $\begin{aligned} & 17 \\ & 20 \end{aligned}$ | $\begin{aligned} & \mathbf{1 8} \\ & 49 \end{aligned}$ |  | 18 | $\begin{aligned} & 42 \\ & 24 \end{aligned}$ | $\begin{aligned} & 26 \\ & 20 \end{aligned}$ | $\begin{aligned} & 27 \\ & 23 \\ & \hline \end{aligned}$ |  | 42 | $\begin{aligned} & 3^{2} \\ & 23 \end{aligned}$ | $\begin{aligned} & 56 \\ & 19 \end{aligned}$ | $\begin{array}{\|l} 19 \\ 31 \\ \hline \end{array}$ |  | 5 | $\begin{aligned} & 22 \\ & 22 \end{aligned}$ | $\begin{aligned} & 20 \\ & 18 \end{aligned}$ | $\begin{aligned} & 46 \\ & 13 \end{aligned}$ | 12 |
| 13 |  | 28 | $\begin{array}{\|l\|} \hline 26 \\ 26 \end{array}$ | $\begin{aligned} & 16 \\ & 19 \end{aligned}$ | $\begin{array}{\|l} 55 \\ 48 \\ \hline \end{array}$ |  | 54 | $\begin{aligned} & 16 \\ & 25 \end{aligned}$ | $\begin{aligned} & 38 \\ & 19 \end{aligned}$ | $\begin{array}{r} 7 \\ 50 \\ \hline \end{array}$ |  | 19 | $\begin{array}{r} 6 \\ 24 \end{array}$ | $\begin{aligned} & 46 \\ & 19 \end{aligned}$ | $\begin{aligned} & 50 \\ & 23 \\ & \hline \end{aligned}$ |  | 42 | $\begin{aligned} & 56 \\ & 23 \end{aligned}$ | $\begin{aligned} & 15 \\ & 18 \end{aligned}$ | $\begin{aligned} & 50 \\ & 30 \\ & \hline \end{aligned}$ |  | 5 | $\begin{aligned} & 44 \\ & 22 \end{aligned}$ | $\begin{array}{\|l\|} \hline 3^{8} \\ 17 \end{array}$ | $\begin{array}{\|l\|} \hline 59 \\ 11 \end{array}$ | 13 |
| 14 |  | 28 | $\begin{aligned} & 52 \\ & 26 \\ & \hline \end{aligned}$ | $\begin{aligned} & 36 \\ & 18 \\ & 18 \end{aligned}$ | $\begin{array}{\|l\|} \hline 43 \\ 49 \\ \hline \end{array}$ |  | 54 | $\begin{aligned} & \mathbf{4 1} \\ & \mathbf{2 5} \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 57 \\ 18 \end{array}$ | $\begin{aligned} & 57 \\ & 49 \\ & \hline \end{aligned}$ |  | 19 | $\begin{aligned} & \mathbf{3 1} \\ & \mathbf{2 4} \\ & \hline \end{aligned}$ | $\begin{array}{\|r\|} \hline 6 \\ 18 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 13 \\ 23 \\ \hline \end{array}$ |  | 43 | $\begin{aligned} & 19 \\ & 23 \\ & \hline \end{aligned}$ | $\begin{aligned} & 34 \\ & 17 \\ & \hline \end{aligned}$ | $\begin{aligned} & 20 \\ & 28 \end{aligned}$ |  | 6 | $\begin{array}{r} 6 \\ 22 \end{array}$ | $\begin{aligned} & 56 \\ & 16 \end{aligned}$ | $\begin{array}{r} 10 \\ \hline 9 \\ \hline \end{array}$ | 14 |
| 15 |  | 29 | $\begin{array}{\|l\|} \hline 18 \\ 26 \\ \hline \end{array}$ | $\begin{aligned} & 55 \\ & 17 \\ & \hline \end{aligned}$ | $\begin{aligned} & \mathbf{3 2} \\ & 49 \\ & \hline \end{aligned}$ |  | 55 | $\begin{array}{r} 7 \\ 25 \\ \hline \end{array}$ | $\begin{aligned} & 16 \\ & 17 \end{aligned}$ | $\begin{aligned} & 46 \\ & 49 \end{aligned}$ |  | 19 | $\begin{aligned} & 55 \\ & 24 \end{aligned}$ | $\begin{array}{r} 24 \\ 17 \\ \hline \end{array}$ | $\begin{aligned} & 36 \\ & 21 \end{aligned}$ |  | 43 | $\begin{aligned} & 42 \\ & 23 \\ & \hline \end{aligned}$ | $\begin{aligned} & 51 \\ & 16 \end{aligned}$ | $\begin{gathered} 48 \\ 28 \end{gathered}$ |  | 6 | $\begin{aligned} & 29 \\ & 22 \end{aligned}$ | $\begin{aligned} & 12 \\ & 15 \\ & \hline \end{aligned}$ | $\begin{array}{r} 19 \\ 8 \end{array}$ | 15 |
| 16 |  | 29 | $\begin{array}{\|l\|} \hline 45 \\ 26 \end{array}$ | $\begin{aligned} & 13 \\ & 16 \end{aligned}$ | $\begin{aligned} & \hline 21 \\ & 49 \\ & \hline \end{aligned}$ |  | 55 | $\begin{aligned} & 32 \\ & 25 \\ & \hline \end{aligned}$ | $\begin{aligned} & 34 \\ & 16 \end{aligned}$ | $\begin{aligned} & 35 \\ & 49 \\ & \hline \end{aligned}$ |  | 20 | $\begin{aligned} & 19 \\ & 24 \\ & \hline \end{aligned}$ | $\begin{aligned} & \mathbf{4 1} \\ & 16 \end{aligned}$ | $\begin{array}{\|l} 57 \\ 21 \end{array}$ |  | 44 | $\begin{array}{r} 6 \\ 23 \\ \hline \end{array}$ | $\begin{array}{r} 8 \\ 15 \\ \hline \end{array}$ | $\begin{aligned} & 16 \\ & 26 \end{aligned}$ |  | 6 | $\begin{array}{\|l} 51 \\ 22 \end{array}$ | $\begin{array}{\|l} 27 \\ 14 \\ \hline \end{array}$ | $\begin{array}{r} 27 \\ \hline \end{array}$ | 16 |
| 17 |  | 30 | $\begin{array}{\|l\|} \hline 11 \\ 26 \\ \hline \end{array}$ | $\begin{aligned} & 30 \\ & 15 \\ & 15 \end{aligned}$ | $\begin{aligned} & 10 \\ & 49 \end{aligned}$ |  | 55 | $\begin{aligned} & 57 \\ & 25 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \mathbf{5 1} \\ 15 \end{array}$ | $\begin{aligned} & 24 \\ & 49 \\ & \hline \end{aligned}$ |  | 20 | $\begin{array}{r} 43 \\ 24 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 58 \\ 15 \\ \hline \end{array}$ | $\begin{aligned} & 18 \\ & 20 \end{aligned}$ |  | 44 | $\begin{aligned} & 29 \\ & 23 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 23 \\ 14 \end{array}$ | $\begin{aligned} & 42 \\ & 26 \end{aligned}$ |  | 7 | $\begin{array}{\|l} 13 \\ 22 \end{array}$ | $\begin{aligned} & \mathbf{4 1} \\ & 13 \end{aligned}$ | $33$ | 17 |
| 18 |  | 30 | $\begin{array}{\|l\|} \hline 37 \\ 26 \end{array}$ | $\begin{aligned} & \hline 45 \\ & 14 \end{aligned}$ | $\begin{array}{\|l} 59 \\ 49 \\ \hline \end{array}$ |  | 56 | $\begin{aligned} & 23 \\ & 25 \\ & \hline \end{aligned}$ | $\begin{array}{r} 7 \\ 14 \\ \hline \end{array}$ | $\begin{aligned} & 13 \\ & 48 \\ & \hline \end{aligned}$ |  | 21 | $\begin{array}{r} 8 \\ 24 \end{array}$ | $\begin{array}{\|l} 13 \\ 14 \\ \hline \end{array}$ | $\begin{aligned} & 38 \\ & 20 \end{aligned}$ |  | 44 | $\begin{aligned} & 5^{2} \\ & 23 \end{aligned}$ | $\begin{aligned} & 38 \\ & 13 \end{aligned}$ | $\begin{array}{r} 8 \\ 24 \\ \hline \end{array}$ |  | 7 | $\begin{aligned} & 35 \\ & 22 \end{aligned}$ | $\begin{array}{\|l\|} \hline 54 \\ 12 \end{array}$ | $\begin{array}{r} 3^{8} \\ \hline \end{array}$ | 18 |
| 19 |  | 31 | $\begin{array}{r\|} \hline 4 \\ 26 \\ \hline \end{array}$ | $\begin{array}{r} \mathbf{o} \\ 13 \\ \hline \end{array}$ | $\begin{aligned} & 48 \\ & 50 \\ & \hline \end{aligned}$ |  | 56 | $\begin{aligned} & 48 \\ & 25 \end{aligned}$ | $\begin{array}{\|l} 22 \\ 13 \\ \hline \end{array}$ | $\begin{array}{r} 1 \\ 48 \\ \hline \end{array}$ |  | 21 | $\begin{aligned} & 32 \\ & 24 \\ & \hline \end{aligned}$ | $\begin{aligned} & 27 \\ & 13 \\ & \hline \end{aligned}$ | $\begin{aligned} & 58 \\ & 19 \end{aligned}$ |  | 45 | $\begin{aligned} & 15 \\ & 23 \end{aligned}$ | $\begin{array}{\|l} 51 \\ 12 \end{array}$ | $\begin{aligned} & 32 \\ & 23 \end{aligned}$ |  | 7 | $\begin{aligned} & 58 \\ & 22 \end{aligned}$ | $\begin{array}{r} 6 \\ 11 \\ \hline \end{array}$ | $42$ | 19 |
| 20 | 54 | 31 | $\begin{aligned} & 30 \\ & 26 \end{aligned}$ | $\begin{aligned} & 14 \\ & 12 \end{aligned}$ | $\begin{aligned} & 38 \\ & 50 \end{aligned}$ | 54 | 57 | $\begin{aligned} & 13 \\ & 25 \\ & \hline \end{aligned}$ | $\begin{aligned} & 35 \\ & 12 \end{aligned}$ | $\begin{aligned} & 49 \\ & 48 \end{aligned}$ | 55 | 21 | $\begin{aligned} & 56 \\ & 24 \end{aligned}$ | $\begin{aligned} & \hline 41 \\ & 12 \end{aligned}$ | $\begin{aligned} & 17 \\ & 18 \end{aligned}$ | 55 | 45 | $\begin{aligned} & 39 \\ & 23 \end{aligned}$ | $\begin{array}{\|r} 3 \\ 11 \end{array}$ | $\begin{aligned} & 55 \\ & 22 \end{aligned}$ | 56 | 8 | $\begin{aligned} & 20 \\ & 22 \end{aligned}$ | $\begin{aligned} & 17 \\ & 10 \end{aligned}$ | $\begin{gathered} 44 \\ 0 \end{gathered}$ | 20 |
| 21 |  | 31 | $\begin{array}{\|l\|} \hline 56 \\ 26 \\ \hline \end{array}$ | $\begin{aligned} & \hline 27 \\ & 11 \end{aligned}$ | $\begin{aligned} & 28 \\ & 50 \\ & \hline \end{aligned}$ |  | 57 | $\begin{aligned} & 38 \\ & 25 \end{aligned}$ | $\begin{aligned} & 48 \\ & 11 \end{aligned}$ | $\begin{aligned} & 37 \\ & 47 \\ & \hline \end{aligned}$ |  | 22 | $\begin{aligned} & 20 \\ & 24 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 53 \\ 11 \end{array}$ | $\begin{aligned} & 35 \\ & 17 \\ & \hline \end{aligned}$ |  | 46 | $\begin{array}{r} 2 \\ 23 \\ \hline \end{array}$ | $\begin{array}{\|l\|} 15 \\ 10 \end{array}$ | $\begin{array}{\|l} 17 \\ 20 \\ \hline \end{array}$ |  | 8 | $\begin{aligned} & 42 \\ & 22 \end{aligned}$ | $\begin{array}{r} 27 \\ 8 \end{array}$ | $\begin{array}{\|l\|} \hline 44 \\ 58 \\ \hline \end{array}$ | 21 |
| 22 |  | 32 | $\begin{aligned} & 22 \\ & 26 \end{aligned}$ | $\begin{aligned} & 39 \\ & 10 \end{aligned}$ | $\begin{aligned} & \mathbf{1 8} \\ & 50 \end{aligned}$ |  | 58 | $\begin{array}{r} 4 \\ 25 \\ \hline \end{array}$ | $\begin{array}{r} 0 \\ 10 \end{array}$ | $\begin{aligned} & 24 \\ & 48 \end{aligned}$ |  | 22 | $\begin{aligned} & 45 \\ & 24 \end{aligned}$ | $\left.\begin{array}{r} 4 \\ 10 \end{array} \right\rvert\,$ | $\begin{aligned} & 5^{2} \\ & 17 \end{aligned}$ |  | 46 | $\begin{aligned} & 25 \\ & 23 \end{aligned}$ | $\begin{array}{r} 25 \\ 9 \end{array}$ | $\begin{array}{\|l} 37 \\ 20 \end{array}$ |  | 9 | $\begin{array}{r} 4 \\ 22 \end{array}$ | $\begin{array}{r} 36 \\ 7 \end{array}$ | $\begin{array}{\|l} \hline 42 \\ 57 \\ \hline \end{array}$ | 22 |
| 23 |  | 32 | $\begin{array}{\|l\|} \hline 48 \\ 26 \end{array}$ | $\begin{array}{r} 50 \\ 9 \\ \hline \end{array}$ | $\begin{array}{r} 8 \\ 50 \\ \hline \end{array}$ |  | 58 | $\begin{aligned} & 29 \\ & 25 \\ & \hline \end{aligned}$ | $\begin{array}{r} 11 \\ 9 \\ \hline \end{array}$ | $\begin{array}{\|l} 12 \\ 47 \\ \hline \end{array}$ |  | 23 | $\begin{array}{r} 9 \\ 24 \\ \hline \end{array}$ | $\begin{array}{r} 15 \\ 9 \\ \hline \end{array}$ | $\begin{array}{r} 9 \\ 16 \end{array}$ |  | 46 | $\begin{array}{\|l\|} \hline 48 \\ 23 \\ \hline \end{array}$ | $\begin{array}{r} 34 \\ 8 \end{array}$ | $\begin{array}{\|l} 57 \\ 18 \end{array}$ |  | 9 | $\begin{aligned} & 26 \\ & 22 \end{aligned}$ | $\begin{array}{r} 44 \\ 6 \end{array}$ | $\begin{aligned} & 39 \\ & 56 \end{aligned}$ | 23 |
| 24 |  | 33 | $\left\lvert\, \begin{aligned} & 14 \\ & 26 \end{aligned}\right.$ | $\begin{array}{r} 59 \\ 8 \end{array}$ | $\begin{array}{\|l\|} \hline 58 \\ 51 \\ \hline \end{array}$ |  | 58 | $\begin{array}{\|l} 54 \\ 25 \\ \hline \end{array}$ | $\begin{array}{r} 20 \\ 8 \end{array}$ | $\begin{aligned} & 59 \\ & 46 \end{aligned}$ |  | 23 | $\begin{aligned} & 33 \\ & 24 \end{aligned}$ | $\begin{array}{r} 24 \\ 8 \end{array}$ | $\begin{aligned} & \mathbf{2 5} \\ & 15 \end{aligned}$ |  | 47 | $\begin{aligned} & 11 \\ & 23 \end{aligned}$ | $\begin{array}{\|r} 43 \\ 7 \\ \hline \end{array}$ | $\begin{aligned} & 15 \\ & 18 \end{aligned}$ |  | 9 | $\begin{aligned} & 48 \\ & 22 \end{aligned}$ | $\begin{array}{\|r} 51 \\ 5 \\ \hline \end{array}$ | $\begin{array}{\|l} 35 \\ 54 \\ \hline \end{array}$ | 24 |
| 25 |  | 33 | $\begin{aligned} & \mathbf{4 1} \\ & \mathbf{2 6} \end{aligned}$ | $\begin{array}{\|l\|} \hline 8 \\ 7 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 49 \\ 51 \\ \hline \end{array}$ |  | 59 | $\begin{aligned} & 19 \\ & 25 \\ & \hline \end{aligned}$ | $\begin{array}{r} 29 \\ 7 \\ \hline \end{array}$ | $\begin{aligned} & 45 \\ & 47 \\ & \hline \end{aligned}$ |  | 23 | $\begin{aligned} & 57 \\ & 24 \\ & \hline \end{aligned}$ | $\begin{array}{r} 32 \\ \hline 7 \\ \hline \end{array}$ | $\begin{aligned} & 40 \\ & 14 \\ & \hline \end{aligned}$ |  | 47 | $\begin{aligned} & 34 \\ & 23 \end{aligned}$ | $\begin{array}{r} 50 \\ 6 \end{array}$ | $\begin{aligned} & 33 \\ & 16 \end{aligned}$ |  | 10 | $\begin{array}{\|l\|} \hline 10 \\ 22 \end{array}$ | $\begin{array}{\|r} \hline 57 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 29 \\ 52 \\ \hline \end{array}$ | 25 |
| 26 |  | 34 | $\begin{array}{\|r\|} \hline 7 \\ 26 \\ \hline \end{array}$ | $\begin{array}{r\|} \hline 16 \\ 6 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 40 \\ 51 \\ \hline \end{array}$ |  | 59 | $\begin{aligned} & 44 \\ & 25 \\ & \hline \end{aligned}$ | $\begin{array}{r} 37 \\ 6 \end{array}$ | $\begin{aligned} & 32 \\ & 4^{2} \end{aligned}$ |  | 24 | $\begin{aligned} & \hline 21 \\ & 24 \\ & \hline \end{aligned}$ | $\begin{array}{r} 39 \\ \hline \end{array}$ | $\begin{aligned} & 54 \\ & 14 \\ & \hline \end{aligned}$ |  | 47 | $\begin{aligned} & 57 \\ & 23 \\ & \hline \end{aligned}$ | $\begin{array}{r} 56 \\ \hline 5 \\ \hline \end{array}$ | $\begin{aligned} & 49 \\ & 15 \\ & \hline \end{aligned}$ |  | 10 | $\begin{aligned} & 33 \\ & 22 \end{aligned}$ | 2 | $\begin{array}{\|l\|} \hline 21 \\ 51 \\ \hline \end{array}$ | 26 |
| 27 |  | 34 | $\begin{aligned} & 33 \\ & 26 \end{aligned}$ | $\begin{array}{r} 23 \\ 5 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 31 \\ 51 \\ \hline \end{array}$ | 55 | 0 | $\begin{array}{r} 9 \\ 25 \\ \hline \end{array}$ | $\begin{array}{r} 44 \\ 5 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{1 8} \\ & \mathbf{4 5} \\ & \hline \end{aligned}$ |  | 24 | $\begin{aligned} & 45 \\ & 24 \\ & \hline \end{aligned}$ | $\begin{array}{r} 46 \\ 5 \\ \hline \end{array}$ | $\begin{array}{r} 8 \\ 13 \\ \hline \end{array}$ |  | 48 | $\begin{aligned} & 21 \\ & 23 \end{aligned}$ | 2 | $\begin{array}{r} 4 \\ 13 \\ \hline \end{array}$ |  | 10 | $\begin{aligned} & 55 \\ & 25 \end{aligned}$ | 6 2 | $\begin{array}{\|l} \mathbf{1 2} \\ 49 \\ \hline \end{array}$ | 27 |
| 28 |  | 34 | $\begin{array}{\|l\|} \hline 59 \\ 26 \end{array}$ | $\begin{array}{r} \hline 29 \\ 4 \\ \hline \end{array}$ | $\begin{aligned} & 22 \\ & 51 \\ & \hline \end{aligned}$ |  | 0 | $\begin{aligned} & 34 \\ & 25 \end{aligned}$ | $\begin{array}{r} 50 \\ 4 \end{array}$ | $\begin{array}{r} 3 \\ 46 \\ \hline \end{array}$ |  | 25 | $\begin{array}{r} 9 \\ 24 \\ \hline \end{array}$ | $\begin{array}{r} 51 \\ \hline \end{array}$ | $\begin{aligned} & 21 \\ & 12 \end{aligned}$ |  | 48 | $\begin{aligned} & 44 \\ & 23 \end{aligned}$ | 6 3 | $\begin{array}{\|l} \mathbf{1 7} \\ 13 \\ \hline \end{array}$ |  | 11 | $\begin{aligned} & 17 \\ & 22 \end{aligned}$ | 9 <br> 1 | 1 <br> 48 | 28 |
| 29 |  | 35 | $\left\|\begin{array}{l} 25 \\ 26 \end{array}\right\|$ | $\begin{array}{r} 34 \\ 3 \\ \hline \end{array}$ | $\left\lvert\, \begin{aligned} & 13 \\ & 51 \end{aligned}\right.$ |  | 0 | $\begin{aligned} & 59 \\ & 25 \\ & \hline \end{aligned}$ | $\begin{array}{r} 54 \\ 3 \end{array}$ | $\begin{array}{\|l} 49 \\ 45 \\ \hline \end{array}$ |  | 25 | $\begin{aligned} & 33 \\ & 24 \\ & \hline \end{aligned}$ | $\begin{array}{r} 55 \\ 3 \end{array}$ | $\begin{aligned} & 33 \\ & 11 \end{aligned}$ |  | 49 | $\begin{array}{r} 7 \\ 23 \end{array}$ | 9 2 | $\begin{array}{\|l} 30 \\ 11 \end{array}$ |  | 11 | $\begin{aligned} & 39 \\ & 22 \end{aligned}$ | $\begin{array}{r} 10 \\ 0 \end{array}$ | $\begin{array}{\|l} 49 \\ 45 \\ \hline \end{array}$ | 29 |
| 30 | 54 | 35 | $\left\lvert\, \begin{aligned} & \mathbf{5 1} \\ & \mathbf{2} \end{aligned}\right.$ | $\begin{array}{r} 38 \\ 2 \end{array}$ | $\begin{array}{r} 4 \\ 5^{2} \\ \hline \end{array}$ | 55 | 1 | $\begin{aligned} & 24 \\ & 25 \\ & \hline \end{aligned}$ | $\begin{array}{r} 58 \\ 2 \end{array}$ | $\begin{array}{\|l} 34 \\ 45 \\ \hline \end{array}$ | 55 | 25 | $\begin{aligned} & 57 \\ & 24 \\ & \hline \end{aligned}$ | $\begin{array}{r} 58 \\ 2 \\ \hline \end{array}$ | $\begin{aligned} & 44 \\ & 11 \end{aligned}$ | 55 | 49 | $\begin{aligned} & 30 \\ & 23 \\ & \hline \end{aligned}$ | $\begin{array}{r} 11 \\ 1 \end{array}$ | $\begin{aligned} & \hline \mathbf{4 1} \\ & 10 \end{aligned}$ | 56 | 12 | $\begin{array}{r} 1 \\ 21 \end{array}$ | $\begin{array}{\|l\|} \hline \mathbf{1 1} \\ 59 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline \mathbf{3 4} \\ \mathbf{4 5} \\ \hline \end{array}$ | 30 |

Bürgi's 1' sine table (reconstruction, D. Roegel, 2016)

| , | $65^{\circ}$ |  |  |  |  | $66^{\circ}$ |  |  |  |  | $67^{\circ}$ |  |  |  |  | $68^{\circ}$ |  |  |  |  | $69^{\circ}$ |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 30 | 54 | 35 | $\begin{array}{\|l\|} \hline 51 \\ 26 \\ \hline \end{array}$ | $\begin{array}{r} 38 \\ 2 \end{array}$ | $\begin{array}{r} 4 \\ 5^{2} \\ \hline \end{array}$ | 55 | 1 | $\begin{aligned} & \hline 24 \\ & 25 \end{aligned}$ | $\begin{array}{r} 58 \\ 2 \end{array}$ | $\begin{aligned} & 34 \\ & 45 \end{aligned}$ | 55 | 25 | $\begin{aligned} & 57 \\ & 24 \end{aligned}$ | $\begin{array}{r} 58 \\ 2 \end{array}$ | $\begin{array}{\|l} 44 \\ 11 \end{array}$ | 55 | 49 | $\begin{aligned} & \hline 30 \\ & 23 \end{aligned}$ | $\begin{array}{r} 11 \\ 1 \end{array}$ | $\begin{array}{\|l} 41 \\ 10 \end{array}$ | 56 | 12 | $\begin{array}{\|r\|} \hline 1 \\ 21 \end{array}$ | $\begin{aligned} & \mathbf{1 1} \\ & 59 \end{aligned}$ | $\begin{array}{\|l} 34 \\ 45 \end{array}$ | 30 |
| 31 |  | 36 | $\begin{aligned} & 17 \\ & 26 \end{aligned}$ | $\begin{gathered} 40 \\ 1 \end{gathered}$ | $\begin{aligned} & 56 \\ & 51 \\ & \hline \end{aligned}$ |  | 1 | $\begin{aligned} & 50 \\ & 25 \\ & \hline \end{aligned}$ | $\begin{aligned} & 1 \\ & 1 \end{aligned}$ | $\begin{aligned} & 19 \\ & 44 \\ & \hline \end{aligned}$ |  | 26 | $\begin{array}{\|l} 22 \\ 24 \\ \hline \end{array}$ | 0 1 | $\begin{aligned} & 55 \\ & 10 \end{aligned}$ |  | 49 | $\begin{array}{\|l} 53 \\ 23 \\ \hline \end{array}$ | $\begin{array}{r} 12 \\ 0 \end{array}$ | $\begin{array}{r} \mathbf{5 1} \\ 9 \end{array}$ |  | 12 | $\begin{aligned} & 23 \\ & 21 \end{aligned}$ | $\begin{aligned} & 11 \\ & 58 \\ & \hline \end{aligned}$ | $\begin{aligned} & 19 \\ & 42 \end{aligned}$ | 31 |
| 32 |  | 36 | $\begin{aligned} & 43 \\ & 26 \end{aligned}$ | $\begin{gathered} 4^{2} \\ 0 \end{gathered}$ | $\begin{aligned} & 47 \\ & 52 \\ & \hline \end{aligned}$ |  | 2 | $\begin{aligned} & 15 \\ & 25 \end{aligned}$ | $\begin{aligned} & 3 \\ & 0 \\ & \hline \end{aligned}$ | $\begin{array}{r} 3 \\ 44 \\ \hline \end{array}$ |  | 26 | $\begin{aligned} & 46 \\ & 24 \\ & \hline \end{aligned}$ | $\begin{aligned} & 2 \\ & 0 \end{aligned}$ | $\begin{aligned} & 5 \\ & 9 \\ & \hline \end{aligned}$ |  | 50 | $\begin{aligned} & 16 \\ & 22 \end{aligned}$ | $\begin{array}{\|l} \mathbf{1 3} \\ 59 \\ \hline \end{array}$ | O |  | 12 | $\begin{aligned} & 45 \\ & 21 \end{aligned}$ | $\begin{array}{\|l\|} \hline 10 \\ 57 \\ \hline \end{array}$ | $\begin{array}{\|r} 1 \\ \mathbf{4}^{1} \\ \hline \end{array}$ | 32 |
| 33 |  | 37 | $\begin{array}{\|r\|} \hline 9 \\ 25 \\ \hline \end{array}$ | $\begin{aligned} & 43 \\ & 59 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 39 \\ 52 \\ \hline \end{array}$ |  | 2 | $\begin{aligned} & 40 \\ & 24 \\ & \hline \end{aligned}$ | $\begin{array}{\|r\|} \hline 3 \\ 59 \\ \hline \end{array}$ | $\begin{aligned} & 47 \\ & 44 \\ & \hline \end{aligned}$ |  | 27 | $\begin{aligned} & 10 \\ & 23 \end{aligned}$ | $\begin{array}{\|r} \hline \mathbf{2} \\ 59 \\ \hline \end{array}$ | $\begin{array}{r} 14 \\ 8 \end{array}$ |  | 50 | $\begin{aligned} & 39 \\ & 22 \end{aligned}$ | $\begin{aligned} & 12 \\ & 58 \\ & \hline \end{aligned}$ | $\begin{aligned} & \hline 7 \\ & 7 \\ & \hline \end{aligned}$ |  | 13 | $\begin{array}{r} 7 \\ 21 \end{array}$ | $\begin{array}{r} 7 \\ 56 \\ \hline \end{array}$ | $\begin{aligned} & 42 \\ & 39 \end{aligned}$ | 33 |
| 34 |  | 37 | $\begin{aligned} & 35 \\ & 25 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 43 \\ 58 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 31 \\ 52 \\ \hline \end{array}$ |  | 3 | $\begin{array}{r} 5 \\ 24 \\ \hline \end{array}$ | $\begin{array}{\|r\|} \hline 3 \\ 5^{8} \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline \mathbf{3 1} \\ 43 \\ \hline \end{array}$ |  | 27 | $\begin{array}{\|l\|} \hline 34 \\ 23 \\ \hline \end{array}$ | $\begin{array}{\|r} \mathbf{1} \\ 58 \\ \hline \end{array}$ | $\begin{array}{r} 22 \\ 7 \\ \hline \end{array}$ |  | 51 | $\begin{array}{\|r\|} \hline 2 \\ 22 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline \mathbf{1 0} \\ 57 \\ \hline \end{array}$ | $\begin{array}{\|r\|} \hline 14 \\ 5 \\ \hline \end{array}$ |  | 13 | $\begin{aligned} & 29 \\ & 21 \\ & \hline \end{aligned}$ | $\begin{array}{\|r\|} \hline 4 \\ 55 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline \mathbf{2 1} \\ 38 \\ \hline \end{array}$ | 34 |
| 35 |  | $3^{8}$ | $\begin{array}{\|r} \mathbf{1} \\ \mathbf{2 5} \\ \hline \end{array}$ | $\begin{aligned} & 42 \\ & 57 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 23 \\ 52 \\ \hline \end{array}$ |  | 3 | $\begin{aligned} & 30 \\ & 24 \\ & \hline \end{aligned}$ | $\begin{array}{\|r\|} \hline \mathbf{2} \\ 57 \\ \hline \end{array}$ | $\begin{array}{\|l} \mathbf{1 4} \\ 43 \\ \hline \end{array}$ |  | 27 | $\begin{array}{\|l} 57 \\ 23 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 59 \\ 57 \\ \hline \end{array}$ | $\begin{array}{r} 29 \\ \hline \\ \hline \end{array}$ |  | 51 | $\begin{aligned} & 25 \\ & 22 \end{aligned}$ | $\begin{array}{r} 7 \\ 56 \\ \hline \end{array}$ | $\begin{array}{r} 19 \\ 3 \\ \hline \end{array}$ |  | 13 | $\begin{aligned} & 50 \\ & 21 \end{aligned}$ | $\begin{array}{\|l} \hline 59 \\ 54 \\ \hline \end{array}$ | $\begin{array}{\|l} 59 \\ 36 \\ \hline \end{array}$ | 35 |
| 36 |  | $3^{8}$ | $\begin{aligned} & \mathbf{2 7} \\ & \mathbf{2 5} \end{aligned}$ | $\begin{aligned} & 40 \\ & 56 \end{aligned}$ | $15$ |  | 3 | $\begin{aligned} & 54 \\ & 24 \end{aligned}$ | $\begin{aligned} & 59 \\ & 56 \end{aligned}$ | $\begin{aligned} & 57 \\ & 42 \\ & \hline \end{aligned}$ |  | 28 | $\begin{array}{\|l\|} \mathbf{2 1} \\ \mathbf{2 3} \end{array}$ | $\begin{aligned} & 56 \\ & 56 \end{aligned}$ | $\begin{array}{r} 36 \\ 5 \end{array}$ |  | 51 | $\begin{aligned} & 48 \\ & 22 \end{aligned}$ | $\begin{array}{r} 3 \\ 55 \end{array}$ | $\begin{array}{\|r} 22 \\ 3 \\ \hline \end{array}$ |  | 14 | $\begin{array}{\|l\|} 12 \\ 21 \end{array}$ | $\begin{array}{\|l} 54 \\ 53 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 35 \\ 34 \end{array}$ | 36 |
| 37 |  | $3^{8}$ | $\begin{array}{\|l\|} \hline 53 \\ 25 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{3 7} \\ & 55 \\ & \hline \end{aligned}$ | $\begin{array}{r} 7 \\ 52 \\ \hline \end{array}$ |  | 4 | $\begin{aligned} & 19 \\ & 24 \end{aligned}$ | $\begin{array}{\|c} 56 \\ 55 \\ \hline \end{array}$ | $\begin{aligned} & 39 \\ & 43 \end{aligned}$ |  | 28 | $\begin{aligned} & 45 \\ & 23 \\ & \hline \end{aligned}$ | $\begin{aligned} & \mathbf{5 2} \\ & 55 \\ & \hline \end{aligned}$ | $\begin{array}{\|r} 41 \\ 5 \\ \hline \end{array}$ |  | 52 | $\begin{aligned} & 10 \\ & 22 \end{aligned}$ | $\begin{aligned} & 5^{8} \\ & 54 \\ & \hline \end{aligned}$ | $\begin{array}{r} 25 \\ 1 \end{array}$ |  | 14 | $\begin{aligned} & 34 \\ & 21 \end{aligned}$ | $\begin{aligned} & 48 \\ & 52 \\ & \hline \end{aligned}$ | $\begin{array}{r} 9 \\ 33 \end{array}$ | 37 |
| $3^{8}$ |  | 39 | $\begin{array}{\|l\|} \hline 19 \\ 25 \\ \hline \end{array}$ | $\begin{aligned} & 3^{2} \\ & 54 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 59 \\ 52 \\ \hline \end{array}$ |  | 4 | $\begin{aligned} & 44 \\ & 24 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline \mathbf{5 2} \\ 54 \\ \hline \end{array}$ | $\begin{aligned} & 22 \\ & 41 \\ & \hline \end{aligned}$ |  | 29 | $\begin{array}{r} 9 \\ 23 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 47 \\ 54 \\ \hline \end{array}$ | $\begin{array}{r} 46 \\ \hline \\ \hline \end{array}$ |  | 52 | $\begin{array}{\|l\|} \hline 33 \\ 22 \end{array}$ | $\begin{aligned} & \mathbf{5 2} \\ & 53 \\ & \hline \end{aligned}$ | $\begin{gathered} 26 \\ 0 \\ \hline \end{gathered}$ |  | 14 | $\begin{aligned} & 56 \\ & 21 \end{aligned}$ | $\begin{array}{\|c\|} \hline 40 \\ 51 \end{array}$ | $\begin{array}{\|l} \hline 42 \\ 31 \\ \hline \end{array}$ | $3^{8}$ |
| 39 |  | 39 | $\begin{aligned} & 45 \\ & 25 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \mathbf{2 7} \\ 53 \\ \hline \end{array}$ | $\begin{aligned} & 51 \\ & 52 \\ & \hline \end{aligned}$ |  | 5 | $\begin{array}{r} 9 \\ 24 \\ \hline \end{array}$ | $\begin{aligned} & 47 \\ & 53 \end{aligned}$ | $\begin{array}{r} 3 \\ 4^{2} \\ \hline \end{array}$ |  | 29 | $\begin{array}{\|l} 33 \\ 23 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{4 1} \\ & 53 \\ & \hline \end{aligned}$ | $\begin{array}{r} 50 \\ 3 \end{array}$ |  | 52 | $\begin{aligned} & 56 \\ & 22 \end{aligned}$ | $\begin{aligned} & 45 \\ & 51 \\ & \hline \end{aligned}$ | $\begin{aligned} & 26 \\ & 59 \\ & \hline \end{aligned}$ |  | 15 | $\begin{aligned} & 18 \\ & 21 \end{aligned}$ | $\begin{aligned} & 32 \\ & 50 \end{aligned}$ | $\begin{array}{\|l} 13 \\ 29 \\ \hline \end{array}$ | 39 |
| 40 | 54 | 40 | $\begin{array}{\|l\|} \hline 11 \\ \mathbf{2 5} \\ \hline \end{array}$ | $\begin{aligned} & 21 \\ & 52 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 43 \\ 53 \\ \hline \end{array}$ | 55 | 5 | $\begin{aligned} & 34 \\ & 24 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 40 \\ 52 \\ \hline \end{array}$ | $\begin{aligned} & 45 \\ & 41 \\ & \hline \end{aligned}$ | 55 | 29 | $\begin{aligned} & 57 \\ & 23 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 34 \\ 52 \\ \hline \end{array}$ | $\begin{array}{r} 53 \\ 3 \\ \hline \end{array}$ | 55 | 53 | $\begin{aligned} & 19 \\ & 22 \\ & \hline \end{aligned}$ | $\begin{aligned} & 37 \\ & 50 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 25 \\ 57 \\ \hline \end{array}$ | 56 | 15 | $\begin{aligned} & 40 \\ & 21 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 22 \\ 49 \\ \hline \end{array}$ | $\begin{aligned} & 42 \\ & 28 \\ & \hline \end{aligned}$ | 40 |
| 41 |  | 40 | $\begin{array}{\|l\|} \hline 37 \\ 25 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 14 \\ 51 \end{array}$ | $\begin{aligned} & 36 \\ & 52 \end{aligned}$ |  | 5 | $\begin{aligned} & 59 \\ & 24 \end{aligned}$ | $\begin{aligned} & 33 \\ & 51 \end{aligned}$ | $\begin{aligned} & 26 \\ & 40 \end{aligned}$ |  | 30 | $\begin{array}{\|l\|} 21 \\ 23 \end{array}$ | $\begin{aligned} & 26 \\ & 51 \end{aligned}$ | $\begin{array}{r} 56 \\ 1 \end{array}$ |  | 53 | $\begin{array}{\|l} 42 \\ 22 \end{array}$ | $\begin{aligned} & \mathbf{2 8} \\ & 49 \end{aligned}$ | $\begin{aligned} & 22 \\ & 57 \\ & \hline \end{aligned}$ |  | 16 | $\begin{array}{r} 2 \\ 21 \\ \hline \end{array}$ | $\begin{aligned} & 12 \\ & 48 \\ & \hline \end{aligned}$ | $\begin{aligned} & 10 \\ & 26 \end{aligned}$ | 41 |
| 42 |  | 41 | $\begin{array}{\|r\|} \hline 3 \\ 25 \\ \hline \end{array}$ | $\begin{array}{r} 6 \\ 50 \end{array}$ | $\begin{aligned} & 28 \\ & 52 \end{aligned}$ |  | 6 | $\begin{aligned} & 24 \\ & 24 \end{aligned}$ | $\begin{aligned} & 25 \\ & 50 \end{aligned}$ | $\begin{array}{r} 6 \\ 40 \end{array}$ |  | 30 | $\begin{array}{\|l} 45 \\ 23 \end{array}$ | $\begin{array}{\|l} 17 \\ 50 \\ \hline \end{array}$ | $\begin{array}{\|r} 57 \\ 1 \end{array}$ |  | 54 | $\begin{array}{r} 5 \\ 22 \end{array}$ | $\begin{aligned} & 18 \\ & 48 \end{aligned}$ | $\begin{aligned} & \mathbf{1 9} \\ & 54 \end{aligned}$ |  | 16 | $\left\lvert\, \begin{aligned} & 24 \\ & 21 \end{aligned}\right.$ | $\begin{array}{r} \mathbf{o} \\ 47 \end{array}$ | $\begin{aligned} & 36 \\ & 24 \end{aligned}$ | 42 |
| 43 |  | 41 | $\begin{array}{\|l\|} \hline 28 \\ 25 \\ \hline \end{array}$ | $\begin{array}{\|l} 57 \\ 49 \\ \hline \end{array}$ | $\begin{aligned} & 20 \\ & 53 \\ & \hline \end{aligned}$ |  | 6 | $\begin{aligned} & 49 \\ & 24 \end{aligned}$ | $\begin{array}{\|l\|} \hline 15 \\ 49 \\ \hline \end{array}$ | $\begin{aligned} & 4^{6} \\ & 40 \end{aligned}$ |  | 31 | $\begin{array}{r} 9 \\ 23 \\ \hline \end{array}$ | $\begin{array}{r} 7 \\ \hline 48 \\ \hline \end{array}$ | $\begin{aligned} & 58 \\ & 59 \\ & \hline \end{aligned}$ |  | 54 | $\begin{aligned} & 28 \\ & 22 \end{aligned}$ | $\begin{array}{r} 7 \\ 47 \\ \hline \end{array}$ | $\begin{array}{\|l} \mathbf{1 3} \\ 54 \\ \hline \end{array}$ |  | 16 | $\begin{array}{\|l} 45 \\ 21 \end{array}$ | $\begin{aligned} & 48 \\ & 46 \\ & \hline \end{aligned}$ | $\begin{array}{r} 0 \\ \mathbf{0} \\ \hline 2 \end{array}$ | 43 |
| 44 |  | 41 | $\begin{aligned} & 54 \\ & 25 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 47 \\ 48 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 13 \\ 52 \\ \hline \end{array}$ |  | 7 | $\begin{aligned} & 14 \\ & 24 \\ & \hline \end{aligned}$ | $\begin{array}{r} \mathbf{5} \\ 4^{8} \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{2 6} \\ & 39 \end{aligned}$ |  | 31 | $\begin{aligned} & 32 \\ & 23 \\ & \hline \end{aligned}$ | $\begin{aligned} & 56 \\ & 47 \\ & \hline \end{aligned}$ | $\begin{aligned} & 57 \\ & 59 \\ & \hline \end{aligned}$ |  | 54 | $\begin{aligned} & 50 \\ & 22 \end{aligned}$ | $\begin{aligned} & 55 \\ & 46 \\ & \hline \end{aligned}$ | $\begin{array}{r} 7 \\ 5^{2} \\ \hline \end{array}$ |  | 17 | $\begin{array}{r} 7 \\ 21 \end{array}$ | $\begin{array}{\|l\|} \hline 34 \\ 45 \\ \hline \end{array}$ | $\begin{aligned} & 22 \\ & 21 \end{aligned}$ | 44 |
| 45 |  | 42 | $\begin{array}{\|l\|} \hline 20 \\ 25 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 36 \\ 47 \\ \hline \end{array}$ | $\begin{array}{\|r} 5 \\ 53 \\ \hline \end{array}$ |  | 7 | $\begin{aligned} & 38 \\ & 24 \end{aligned}$ | $\begin{array}{\|l} 54 \\ 47 \\ \hline \end{array}$ | $\begin{array}{r} 5 \\ 39 \\ \hline \end{array}$ |  | 31 | $\begin{aligned} & 56 \\ & 23 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 44 \\ 46 \\ \hline \end{array}$ | $\begin{aligned} & 56 \\ & 58 \\ & \hline \end{aligned}$ |  | 55 | $\left\lvert\, \begin{aligned} & 13 \\ & 22 \end{aligned}\right.$ | $\begin{aligned} & \mathbf{4 1} \\ & 45 \end{aligned}$ | $\begin{array}{\|l} 59 \\ 51 \\ \hline \end{array}$ |  | 17 | $\begin{aligned} & 29 \\ & 21 \end{aligned}$ | $\begin{array}{\|l\|} \hline 19 \\ 44 \\ \hline \end{array}$ | $\begin{array}{\|l} 43 \\ 19 \\ \hline \end{array}$ | 45 |
| 46 |  | 42 | $\begin{aligned} & 46 \\ & 25 \\ & \hline \end{aligned}$ | $\begin{aligned} & 23 \\ & 46 \end{aligned}$ | $\begin{aligned} & 58 \\ & 5^{2} \\ & \hline \end{aligned}$ |  | 8 | $\begin{array}{r} 3 \\ 24 \\ \hline \end{array}$ | $\begin{aligned} & 41 \\ & 46 \\ & \hline \end{aligned}$ | $\begin{aligned} & 44 \\ & 38 \\ & \hline \end{aligned}$ |  | 32 | $\begin{aligned} & 20 \\ & 23 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline \mathbf{3 1} \\ 45 \\ \hline \end{array}$ | $\begin{aligned} & 54 \\ & 57 \\ & \hline \end{aligned}$ |  | 55 | $\begin{aligned} & 36 \\ & 22 \end{aligned}$ | $\begin{array}{r} \mathbf{2 7} \\ 44 \\ \hline \end{array}$ | $\begin{aligned} & 50 \\ & 50 \\ & \hline \end{aligned}$ |  | 17 | $\begin{array}{\|l} 51 \\ 21 \end{array}$ | $\begin{array}{r} 4 \\ 43 \\ \hline \end{array}$ | $\begin{array}{\|r} \hline \mathbf{2} \\ 17 \\ \hline \end{array}$ | 46 |
| 47 |  | 43 | $\begin{aligned} & 12 \\ & 25 \end{aligned}$ | $\begin{aligned} & 10 \\ & 45 \end{aligned}$ | $\begin{aligned} & 50 \\ & 52 \end{aligned}$ |  | 8 | $\begin{aligned} & 28 \\ & 24 \\ & \hline \end{aligned}$ | $\begin{aligned} & 28 \\ & 45 \end{aligned}$ | $\begin{array}{\|l} 22 \\ 38 \\ \hline \end{array}$ |  | 32 | $\begin{aligned} & 44 \\ & 23 \\ & \hline \end{aligned}$ | $\begin{aligned} & \mathbf{1 7} \\ & \mathbf{4 4} \\ & \hline \end{aligned}$ | $\begin{aligned} & 51 \\ & 56 \end{aligned}$ |  | 55 | $\begin{aligned} & 59 \\ & 22 \end{aligned}$ | $\begin{aligned} & 12 \\ & 43 \end{aligned}$ | $\begin{aligned} & 40 \\ & 48 \end{aligned}$ |  | 18 | $\begin{array}{\|l\|} 12 \\ 21 \end{array}$ | $\begin{aligned} & 47 \\ & 42 \end{aligned}$ | $\begin{array}{\|l} \hline 19 \\ 15 \end{array}$ | 47 |
| 48 |  | 43 | $\begin{aligned} & \mathbf{3 7} \\ & 25 \end{aligned}$ | $\begin{aligned} & \mathbf{5 6} \\ & 44 \end{aligned}$ | $\begin{array}{\|l} \hline \mathbf{4 2} \\ 53 \\ \hline \end{array}$ |  | 8 | $\begin{aligned} & 53 \\ & 24 \end{aligned}$ | $\begin{array}{\|l} 14 \\ 44 \\ \hline \end{array}$ | $\begin{array}{r} \mathbf{o} \\ 37 \end{array}$ |  | 33 | $\begin{array}{r} 8 \\ 23 \\ \hline \end{array}$ | $\begin{array}{r} \mathbf{2} \\ 43 \\ \hline \end{array}$ | $\begin{aligned} & 47 \\ & 55 \end{aligned}$ |  | 56 | $\begin{aligned} & 21 \\ & 22 \end{aligned}$ | $\begin{aligned} & 56 \\ & 42 \end{aligned}$ | $\begin{aligned} & 28 \\ & 47 \end{aligned}$ |  | 18 | $\begin{aligned} & 34 \\ & 21 \end{aligned}$ | $\begin{aligned} & 29 \\ & 41 \end{aligned}$ | $\begin{array}{\|l} 34 \\ 14 \\ \hline \end{array}$ | 48 |
| 49 |  | 44 | $\begin{array}{\|r\|} \hline 3 \\ 25 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{4 1} \\ & 43 \end{aligned}$ | $\begin{aligned} & 35 \\ & 52 \\ & \hline \end{aligned}$ |  | 9 | $\begin{aligned} & 17 \\ & 24 \end{aligned}$ | $\begin{aligned} & 58 \\ & 43 \end{aligned}$ | $\begin{array}{\|l\|} \hline 37 \\ 37 \end{array}$ |  | 33 | $\begin{array}{\|l\|} \hline \mathbf{3 1} \\ \mathbf{2 3} \end{array}$ | $\begin{aligned} & 46 \\ & 42 \end{aligned}$ | $\begin{aligned} & 42 \\ & 54 \end{aligned}$ |  | 56 | $\begin{array}{\|l\|} 44 \\ 22 \end{array}$ | $\begin{array}{\|l} 39 \\ 41 \\ \hline \end{array}$ | $\begin{aligned} & 15 \\ & 45 \end{aligned}$ |  | 18 | $\begin{aligned} & 56 \\ & 21 \end{aligned}$ | $\begin{aligned} & 10 \\ & 40 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 48 \\ 12 \end{array}$ | 49 |
| 50 | 54 | 44 | $\begin{aligned} & 29 \\ & 25 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 25 \\ 4^{2} \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 27 \\ 52 \\ \hline \end{array}$ | 55 | 9 | $\begin{aligned} & \mathbf{4 2}^{2} \\ & \mathbf{2 4} \\ & \hline \end{aligned}$ | $\begin{aligned} & 42 \\ & 42 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline \mathbf{1 4} \\ 3^{6} \\ \hline \end{array}$ | 55 | 33 | $\begin{aligned} & 55 \\ & 23 \\ & \hline \end{aligned}$ | $\begin{aligned} & 29 \\ & 41 \end{aligned}$ | $\begin{aligned} & 36 \\ & 53 \end{aligned}$ | 55 | 57 | $\begin{array}{r} 7 \\ 22 \end{array}$ | $\begin{array}{\|l} \hline 21 \\ 40 \\ \hline \end{array}$ | $\begin{array}{r} \mathbf{o} \\ 44 \\ \hline \end{array}$ | 56 | 19 | $\begin{aligned} & 17 \\ & 21 \end{aligned}$ | $\begin{array}{\|l\|} \hline \mathbf{5 1} \\ 39 \\ \hline \end{array}$ | $\begin{array}{\|r} \hline 0 \\ 10 \\ \hline \end{array}$ | 50 |
| 51 |  | 44 | $\begin{array}{\|l\|} \hline 55 \\ 25 \\ \hline \end{array}$ | $\begin{array}{r} 8 \\ 41 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 19 \\ 53 \end{array}$ |  | 10 | $\begin{array}{r} 7 \\ 24 \\ \hline \end{array}$ | $\begin{aligned} & 24 \\ & 41 \\ & \hline \end{aligned}$ | $\begin{aligned} & 50 \\ & 36 \end{aligned}$ |  | 34 | $\begin{aligned} & 19 \\ & 23 \end{aligned}$ | $\begin{array}{\|l} 11 \\ 40 \\ \hline \end{array}$ | $\begin{aligned} & 29 \\ & 53 \end{aligned}$ |  | 57 | $\begin{array}{\|l} 30 \\ 22 \end{array}$ | $\begin{array}{r} \mathbf{1} \\ 39 \end{array}$ | $\begin{array}{\|l} 44 \\ 43 \end{array}$ |  | 19 | $\begin{array}{\|l} 39 \\ 21 \end{array}$ | $\begin{aligned} & 30 \\ & 38 \\ & 38 \end{aligned}$ | $\begin{array}{\|r} \mathbf{1 0} \\ 9 \\ \hline \end{array}$ | 51 |
| 52 |  | 45 | $\begin{aligned} & 20 \\ & 25 \\ & \hline \end{aligned}$ | $\begin{aligned} & 50 \\ & 40 \\ & \hline \end{aligned}$ | $\begin{aligned} & 12 \\ & 52 \end{aligned}$ |  | 10 | $\begin{aligned} & 32 \\ & 24 \\ & \hline \end{aligned}$ | $\begin{array}{r} 6 \\ 40 \\ \hline \end{array}$ | $\begin{aligned} & 26 \\ & 35 \end{aligned}$ |  | 34 | $\begin{aligned} & 42 \\ & 23 \\ & \hline \end{aligned}$ | $\begin{aligned} & \mathbf{5 2} \\ & 39 \end{aligned}$ | $\begin{aligned} & 22 \\ & 51 \end{aligned}$ |  | 57 | $\begin{aligned} & 52 \\ & 22 \end{aligned}$ | $\begin{array}{\|l\|} \hline \mathbf{4 1} \\ \mathbf{3}^{8} \end{array}$ | $\begin{array}{\|l} 27 \\ 42 \\ \hline \end{array}$ |  | 20 | $\begin{array}{r} 1 \\ 21 \\ \hline \end{array}$ | $\begin{array}{\|r} 8 \\ 37 \\ \hline \end{array}$ | $\begin{array}{r} 19 \\ \hline 7 \end{array}$ | 52 |
| 53 |  | 45 | $\begin{array}{\|l\|} \hline 46 \\ 25 \\ \hline \end{array}$ | $\begin{array}{\|l} \mathbf{3 1} \\ 39 \\ \hline \end{array}$ | $\begin{array}{r} 4 \\ 52 \\ \hline \end{array}$ |  | 10 | $\begin{aligned} & 5^{6} \\ & 24 \end{aligned}$ | $\begin{aligned} & 47 \\ & 39 \end{aligned}$ | $\begin{array}{r} \mathbf{1} \\ 35 \\ \hline \end{array}$ |  | 35 | $\begin{array}{r} 6 \\ 23 \\ \hline \end{array}$ | $\begin{array}{\|l} \mathbf{3 2}^{2} \\ \mathbf{3}^{8} \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{1 3} \\ & 50 \end{aligned}$ |  | 58 | $\begin{aligned} & 15 \\ & 22 \end{aligned}$ | $\begin{aligned} & 20 \\ & 37 \\ & \hline \end{aligned}$ | $\begin{array}{r} 9 \\ 40 \\ \hline \end{array}$ |  | 20 | $\begin{aligned} & 22 \\ & 21 \end{aligned}$ | $\begin{aligned} & 45 \\ & 36 \end{aligned}$ | $\begin{array}{r} 26 \\ \hline \\ \hline \end{array}$ | 53 |
| 54 |  | 46 | $\begin{aligned} & 12 \\ & 25 \end{aligned}$ | $\begin{aligned} & 10 \\ & 38 \end{aligned}$ | $\begin{aligned} & 56 \\ & 52 \end{aligned}$ |  | 11 | $\begin{aligned} & 21 \\ & 24 \\ & \hline \end{aligned}$ | $\begin{array}{l\|} 26 \\ 38 \end{array}$ | $\begin{aligned} & 36 \\ & 35 \end{aligned}$ |  | 35 | $\begin{aligned} & 30 \\ & 23 \end{aligned}$ | $\begin{array}{\|l\|} \mathbf{1 1} \\ 37 \\ \hline \end{array}$ | $\begin{array}{r} 3 \\ 50 \end{array}$ |  | 58 | $\begin{aligned} & 37 \\ & 22 \end{aligned}$ | $\begin{aligned} & 57 \\ & 36 \end{aligned}$ | $\begin{aligned} & 49 \\ & 38 \end{aligned}$ |  | 20 | $\begin{array}{\|l} 44 \\ 21 \end{array}$ | $\begin{aligned} & \mathbf{2 1} \\ & 35 \end{aligned}$ | $\begin{array}{r} 30 \\ 4 \end{array}$ | 54 |
| 55 |  | 46 | $\begin{array}{\|l\|} \hline 37 \\ 25 \\ \hline \end{array}$ | $\begin{array}{\|} 49 \\ 37 \\ \hline \end{array}$ | $\begin{aligned} & 48 \\ & 52 \\ & \hline \end{aligned}$ |  | 11 | $\begin{array}{\|l\|} \hline 46 \\ 24 \\ \hline \end{array}$ | $\begin{array}{\|r\|} \hline 5 \\ 37 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline \mathbf{1 1} \\ 33 \\ \hline \end{array}$ |  | 35 | $\begin{array}{\|l\|} \hline 53 \\ 23 \\ \hline \end{array}$ | $\begin{aligned} & 48 \\ & 36 \end{aligned}$ | $\begin{aligned} & 53 \\ & 48 \\ & \hline \end{aligned}$ |  | 59 | $\begin{array}{r} 0 \\ 22 \\ \hline \end{array}$ | $\begin{aligned} & 34 \\ & 35 \end{aligned}$ | $\begin{aligned} & 27 \\ & 38 \end{aligned}$ |  | 21 | $\begin{array}{r} 5 \\ 21 \end{array}$ | $\begin{array}{\|l\|} \hline 56 \\ 34 \\ \hline \end{array}$ | $34$ | 55 |
| 56 |  | 47 | $\begin{array}{\|r\|} \hline 3 \\ 25 \\ \hline \end{array}$ | $\begin{aligned} & 27 \\ & 36 \\ & \hline \end{aligned}$ | $\begin{aligned} & 40 \\ & 52 \\ & \hline \end{aligned}$ |  | 12 | $\begin{aligned} & 10 \\ & 24 \\ & \hline \end{aligned}$ | $\begin{aligned} & 42 \\ & 36 \\ & \hline \end{aligned}$ | $\begin{aligned} & 44 \\ & 34 \\ & \hline \end{aligned}$ |  | 36 | $\begin{array}{\|l} 17 \\ 23 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 25 \\ 35 \\ \hline \end{array}$ | $\begin{aligned} & 41 \\ & 48 \\ & \hline \end{aligned}$ |  | 59 | $\begin{aligned} & 23 \\ & 22 \end{aligned}$ | $\begin{array}{\|l} \mathbf{1 0} \\ 34 \\ \hline \end{array}$ | $\begin{array}{r} 5 \\ 35 \\ \hline \end{array}$ |  | 21 | $\begin{aligned} & 27 \\ & 21 \end{aligned}$ | $\begin{aligned} & 30 \\ & 32 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 35 \\ 59 \\ \hline \end{array}$ | 56 |
| 57 |  | 47 | $\begin{aligned} & 29 \\ & 25 \\ & \hline \end{aligned}$ | $\begin{array}{r} 4 \\ 35 \\ \hline \end{array}$ | $\begin{aligned} & 32 \\ & 52 \end{aligned}$ |  | 12 | $\begin{aligned} & 35 \\ & 24 \\ & \hline \end{aligned}$ | $\begin{aligned} & 19 \\ & 35 \\ & \hline \end{aligned}$ | $\begin{aligned} & 18 \\ & 32 \end{aligned}$ |  | 36 | $\begin{array}{\|l} \mathbf{4 1} \\ \mathbf{2 3} \end{array}$ | $\begin{array}{\|r} \mathbf{1} \\ 34 \\ \hline \end{array}$ | $\begin{aligned} & 29 \\ & 46 \\ & \hline \end{aligned}$ |  | 59 | $\begin{aligned} & 45 \\ & 22 \end{aligned}$ | $\begin{aligned} & 44 \\ & 33 \end{aligned}$ | $\begin{aligned} & 40 \\ & 35 \end{aligned}$ |  | 21 | $\begin{array}{\|l} 49 \\ 21 \end{array}$ | $\begin{array}{r} 3 \\ 31 \\ \hline \end{array}$ | $\begin{array}{\|l} 34 \\ 58 \\ \hline \end{array}$ | 57 |
| 58 |  | 47 | $\begin{array}{\|l\|} \hline 54 \\ 25 \\ \hline \end{array}$ | $\begin{aligned} & 40 \\ & 34 \end{aligned}$ | $24$ |  | 12 | $\begin{aligned} & 59 \\ & 24 \end{aligned}$ | $\begin{aligned} & 54 \\ & 34 \\ & \hline \end{aligned}$ | $\begin{aligned} & 50 \\ & 32 \end{aligned}$ |  | 37 | $\begin{array}{r} 4 \\ 23 \\ \hline \end{array}$ | $\begin{aligned} & 36 \\ & 33 \end{aligned}$ | $\begin{aligned} & 15 \\ & 46 \end{aligned}$ | 56 | 0 | $\begin{array}{\|r\|} \hline 8 \\ 22 \end{array}$ | $\begin{aligned} & 18 \\ & 32 \end{aligned}$ | $\begin{aligned} & 15 \\ & 33 \end{aligned}$ |  | 22 | $\begin{array}{\|l\|l} 10 \\ 21 \end{array}$ | $\begin{aligned} & 35 \\ & 30 \\ & \hline \end{aligned}$ | $\begin{aligned} & 32 \\ & 56 \end{aligned}$ | 58 |
| 59 |  | 48 | $\begin{aligned} & 20 \\ & 25 \end{aligned}$ | $\begin{aligned} & 15 \\ & 33 \end{aligned}$ | $\begin{aligned} & 16 \\ & 52 \end{aligned}$ |  | 13 | $\begin{aligned} & 24 \\ & 24 \end{aligned}$ | $\begin{aligned} & 29 \\ & 33 \end{aligned}$ | $\begin{aligned} & 22 \\ & 32 \\ & \hline \end{aligned}$ |  | 37 | $\begin{aligned} & 28 \\ & 23 \\ & \hline \end{aligned}$ | $\begin{aligned} & 10 \\ & 32 \end{aligned}$ | $\begin{array}{r} 1 \\ 44 \\ \hline \end{array}$ |  | 0 | $\begin{aligned} & 30 \\ & 22 \end{aligned}$ | $\begin{array}{\|l} 50 \\ 31 \end{array}$ | $\begin{aligned} & 48 \\ & 32 \end{aligned}$ |  | 22 | $\begin{aligned} & 32 \\ & 21 \end{aligned}$ | $\begin{array}{r} 6 \\ 29 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{2 8} \\ & 54 \end{aligned}$ | 59 |
| 60 | 54 | 48 | $\begin{array}{\|l\|} \hline 45 \\ 25 \\ \hline \end{array}$ | $\begin{array}{\|l} 49 \\ 3^{2} \\ \hline \end{array}$ | $\begin{array}{r} 8 \\ 51 \end{array}$ | 55 | 13 | $\begin{array}{r} 49 \\ 24 \\ \hline \end{array}$ | $\begin{array}{r} 2 \\ 32 \\ \hline \end{array}$ | $\begin{array}{\|l} 54 \\ 31 \\ \hline \end{array}$ | 55 | 37 | $\begin{array}{\|l} \mathbf{5 1} \\ \mathbf{2 3} \end{array}$ | $\begin{array}{\|l} 42 \\ 31 \\ \hline \end{array}$ | $\begin{array}{\|l} 45 \\ 44 \\ \hline \end{array}$ | 56 | 0 | $\begin{aligned} & 53 \\ & 22 \end{aligned}$ | $\begin{aligned} & 22 \\ & 30 \\ & \hline \end{aligned}$ | $\begin{aligned} & 20 \\ & 30 \\ & \hline \end{aligned}$ | 56 | 22 | $\begin{array}{\|l} 53 \\ 21 \end{array}$ | $\begin{aligned} & 36 \\ & 28 \end{aligned}$ | $\begin{array}{\|l} \mathbf{2 2} \\ 52 \\ \hline \end{array}$ | 60 |

Bürgi's 1' sine table (reconstruction, D. Roegel, 2016)

| , | $70^{\circ}$ |  |  |  |  | $71^{\circ}$ |  |  |  |  | $72^{\circ}$ |  |  |  |  | $73^{\circ}$ |  |  |  |  | $74^{\circ}$ |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 0 | 56 | 22 | $\begin{array}{\|l\|} \hline 53 \\ 21 \end{array}$ | $\begin{aligned} & 36 \\ & 28 \end{aligned}$ | $\begin{aligned} & 22 \\ & 52 \\ & \hline \end{aligned}$ | 56 | 43 | $\begin{aligned} & 5^{2} \\ & 20 \end{aligned}$ | $\begin{array}{r} 0 \\ 26 \end{array}$ | $\begin{aligned} & \hline 44 \\ & 51 \\ & \hline \end{aligned}$ | 57 | 3 | $\begin{aligned} & \hline 48 \\ & 19 \end{aligned}$ | $\begin{array}{\|l} \hline 12 \\ 24 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{2 7} \\ & \mathbf{2 7} \end{aligned}$ | 57 | 22 | $\begin{aligned} & \hline \mathbf{4 1} \\ & \mathbf{1 8} \end{aligned}$ | $\begin{aligned} & \hline 49 \\ & 21 \end{aligned}$ | $\begin{array}{\|l\|} \hline 38 \\ 42 \\ \hline \end{array}$ | 57 | 40 | $\begin{aligned} & \mathbf{3 2} \\ & 17 \end{aligned}$ | $\begin{aligned} & \hline \mathbf{3 1} \\ & 18 \end{aligned}$ | $\begin{aligned} & 35 \\ & 36 \end{aligned}$ | 0 |
| 1 |  | 23 | $\begin{aligned} & 15 \\ & 21 \end{aligned}$ | $\begin{array}{r} 5 \\ 27 \\ \hline \end{array}$ | $\begin{aligned} & \hline 14 \\ & 51 \\ & \hline \end{aligned}$ |  | 44 | $\begin{aligned} & 12 \\ & 20 \end{aligned}$ | $\begin{array}{\|l\|} \hline 27 \\ 25 \\ \hline \end{array}$ | $\begin{array}{\|l} 35 \\ 49 \\ \hline \end{array}$ |  | 4 | $\begin{array}{r} 7 \\ 19 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 36 \\ 23 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 54 \\ 24 \\ \hline \end{array}$ |  | 23 | $\begin{array}{r} \mathbf{o} \\ 18 \\ \hline \end{array}$ | $\begin{aligned} & 11 \\ & 20 \end{aligned}$ | $\begin{array}{\|l} \hline 20 \\ 38 \\ \hline \end{array}$ |  | 40 | $\begin{aligned} & 49 \\ & 17 \end{aligned}$ | $\begin{array}{\|l} 50 \\ 17 \\ \hline \end{array}$ | $\begin{array}{\|l\|l\|} \hline \mathbf{1 1} \\ 33 \\ \hline \end{array}$ | 1 |
| 2 |  | 23 | $\begin{array}{l\|} \hline 36 \\ 21 \end{array}$ | $\begin{array}{\|l\|} \hline 33 \\ 26 \end{array}$ | $\begin{array}{r} 5 \\ 48 \\ \hline \end{array}$ |  | 44 | $\begin{aligned} & 32 \\ & 20 \end{aligned}$ | $\begin{aligned} & 53 \\ & 24 \\ & \hline \end{aligned}$ | $\begin{aligned} & 24 \\ & 46 \\ & \hline \end{aligned}$ |  | 4 | $\begin{aligned} & 27 \\ & 19 \end{aligned}$ | $\begin{array}{r} \hline 0 \\ 22 \end{array}$ | $\begin{array}{\|l\|} \hline 18 \\ 21 \end{array}$ |  | 23 | $\begin{aligned} & \hline 18 \\ & 18 \end{aligned}$ | $\begin{array}{\|l\|} \hline \mathbf{3 1} \\ 19 \\ \hline \end{array}$ | $\begin{aligned} & 58 \\ & 36 \\ & \hline \end{aligned}$ |  | 41 | $\begin{array}{r} 7 \\ 17 \end{array}$ | $\begin{array}{r} 7 \\ 16 \end{array}$ | $\begin{array}{\|l} \hline 44 \\ 29 \\ \hline \end{array}$ | 2 |
| 3 |  | 23 | $\begin{array}{\|l} 57 \\ 21 \end{array}$ | $\begin{aligned} & 59 \\ & 25 \\ & \hline \end{aligned}$ | $\begin{array}{r} 53 \\ 47 \\ \hline \end{array}$ |  | 44 | $\begin{aligned} & 53 \\ & 20 \end{aligned}$ | $\begin{array}{\|l} \hline 18 \\ 23 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 10 \\ 44 \\ \hline \end{array}$ |  | 4 | $\begin{aligned} & 46 \\ & 19 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 22 \\ 21 \end{array}$ | $\begin{array}{\|l} 39 \\ 19 \\ \hline \end{array}$ |  | 23 | $\begin{aligned} & 36 \\ & 18 \end{aligned}$ | $\begin{aligned} & 51 \\ & 18 \end{aligned}$ | $\begin{array}{\|l\|} \hline 34 \\ 32 \\ \hline \end{array}$ |  | 41 | $\begin{array}{\|l} 24 \\ 17 \\ \hline \end{array}$ | $\begin{array}{\|l} 24 \\ 15 \\ \hline \end{array}$ | $\begin{array}{\|l} 13 \\ \mathbf{2 7} \\ \hline \end{array}$ | 3 |
| 4 |  | 24 | $\begin{aligned} & \hline 19 \\ & 21 \end{aligned}$ | $\begin{aligned} & 25 \\ & 24 \end{aligned}$ | $40$ |  | 45 | $\begin{aligned} & 13 \\ & 20 \end{aligned}$ | $\begin{aligned} & \hline \mathbf{4 1} \\ & \mathbf{2 2} \end{aligned}$ | $\begin{aligned} & 54 \\ & 42 \end{aligned}$ |  | 5 | $\begin{array}{r} 5 \\ 19 \\ \hline \end{array}$ | $\begin{aligned} & 43 \\ & 20 \end{aligned}$ | $\begin{array}{\|l\|} \hline 58 \\ 17 \\ \hline \end{array}$ |  | 23 | $\begin{aligned} & 55 \\ & 18 \end{aligned}$ | $\begin{array}{\|l\|} \hline 10 \\ 17 \\ \hline \end{array}$ | $\begin{array}{r} 6 \\ 30 \\ \hline \end{array}$ |  | 41 | $\begin{aligned} & \mathbf{4 1} \\ & \mathbf{1 7} \end{aligned}$ | $\begin{array}{\|l} \hline 39 \\ 14 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 40 \\ 23 \\ \hline \end{array}$ | 4 |
| 5 |  | 24 | $\begin{aligned} & 40 \\ & 21 \end{aligned}$ | $\begin{aligned} & 50 \\ & 23 \\ & \hline \end{aligned}$ | $\begin{aligned} & \hline 25 \\ & 43 \\ & \hline \end{aligned}$ |  | 45 | $\begin{aligned} & 34 \\ & 20 \end{aligned}$ | $\begin{array}{\|r\|} \hline 4 \\ 21 \end{array}$ | $\begin{array}{\|l} \hline 36 \\ 39 \\ \hline \end{array}$ |  | 5 | $\begin{aligned} & 25 \\ & 19 \\ & \hline \end{aligned}$ | $\begin{array}{r} 4 \\ 19 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 15 \\ 13 \\ \hline \end{array}$ |  | 24 | $\begin{aligned} & 13 \\ & 18 \end{aligned}$ | $\begin{aligned} & 27 \\ & 16 \end{aligned}$ | $\begin{array}{\|l} \hline 36 \\ 27 \\ \hline \end{array}$ |  | 41 | $\begin{aligned} & 58 \\ & 17 \end{aligned}$ | $\begin{array}{\|l\|} \hline 54 \\ 13 \\ \hline \end{array}$ | $\begin{array}{\|r} \hline 3 \\ 19 \\ \hline \end{array}$ | 5 |
| 6 |  | 25 | $\begin{array}{r} 2 \\ 21 \\ \hline \end{array}$ | $\begin{array}{l\|} \hline 14 \\ 22 \end{array}$ | $\begin{array}{r} 8 \\ 41 \\ \hline \end{array}$ |  | 45 | $\begin{aligned} & 54 \\ & 20 \end{aligned}$ | $\begin{aligned} & 26 \\ & 20 \end{aligned}$ | $\begin{array}{\|l\|} \hline 15 \\ 37 \\ \hline \end{array}$ |  | 5 | $\begin{aligned} & 44 \\ & 19 \end{aligned}$ | $\begin{aligned} & 23 \\ & 18 \end{aligned}$ | $\begin{aligned} & \hline 28 \\ & 12 \end{aligned}$ |  | 24 | $\begin{aligned} & \mathbf{3 1} \\ & \mathbf{1 8} \end{aligned}$ | $\begin{array}{\|l\|} \hline 44 \\ 15 \\ \hline \end{array}$ | $\begin{array}{\|r} 3 \\ 24 \\ \hline \end{array}$ |  | 42 | $\begin{aligned} & 16 \\ & 17 \end{aligned}$ | $\begin{array}{r} 7 \\ 12 \end{array}$ | $\begin{array}{\|l} \hline 22 \\ 17 \\ \hline \end{array}$ | 6 |
| 7 |  | 25 | $\left\lvert\, \begin{aligned} & 23 \\ & 21 \end{aligned}\right.$ | $\begin{array}{l\|} \hline 36 \\ 21 \end{array}$ | $\begin{aligned} & 49 \\ & 39 \\ & \hline \end{aligned}$ |  | 46 | $\left\lvert\, \begin{aligned} & 14 \\ & 20 \end{aligned}\right.$ | $\begin{aligned} & 46 \\ & 19 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 52 \\ 35 \\ \hline \end{array}$ |  | 6 | $\begin{array}{r} 3 \\ 19 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{4 1} \\ & \mathbf{1} \end{aligned}$ | $\begin{array}{r} 40 \\ 80 \end{array}$ |  | 24 | $\begin{aligned} & 49 \\ & 18 \end{aligned}$ | $\begin{aligned} & 59 \\ & 14 \end{aligned}$ | $\begin{aligned} & 27 \\ & 21 \end{aligned}$ |  | 42 | $\begin{array}{\|l} 33 \\ 17 \\ \hline \end{array}$ | $\begin{array}{\|l\|} 19 \\ 11 \end{array}$ | $\begin{aligned} & 39 \\ & 13 \end{aligned}$ | 7 |
| 8 |  | 25 | $\begin{array}{\|l\|} \hline 44 \\ 21 \end{array}$ | $\begin{aligned} & 58 \\ & 20 \end{aligned}$ | $\begin{aligned} & 28 \\ & 37 \\ & \hline \end{aligned}$ |  | 46 | $\begin{aligned} & 35 \\ & 20 \end{aligned}$ | $\begin{array}{r} 6 \\ 18 \end{array}$ | $\begin{array}{\|l} 27 \\ 33 \\ \hline \end{array}$ |  | 6 | $\begin{array}{\|l} 22 \\ 19 \end{array}$ | $\begin{aligned} & 58 \\ & 16 \end{aligned}$ | $\begin{array}{r} 48 \\ \hline 6 \end{array}$ |  | 25 | $\begin{array}{r} 8 \\ 18 \end{array}$ | $\begin{array}{\|l\|} \hline 13 \\ 13 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 48 \\ 17 \\ \hline \end{array}$ |  | 42 | $\begin{aligned} & 50 \\ & 17 \end{aligned}$ | $\begin{aligned} & 30 \\ & 10 \end{aligned}$ | $\begin{array}{\|l} 52 \\ 10 \end{array}$ | 8 |
| 9 |  | 26 | $\begin{array}{r} 6 \\ 21 \end{array}$ | $\begin{aligned} & 19 \\ & 19 \\ & \hline \end{aligned}$ | $\begin{array}{r} 5 \\ 36 \\ \hline \end{array}$ |  | 46 | $\begin{aligned} & 55 \\ & 20 \end{aligned}$ | $\begin{array}{\|l} 25 \\ 17 \\ \hline \end{array}$ | $\begin{array}{\|r} \mathbf{0} \\ 3^{1} \\ \hline \end{array}$ |  | 6 | $\begin{array}{\|l} 42 \\ 19 \end{array}$ | $\begin{array}{\|l} 14 \\ 15 \\ \hline \end{array}$ | $\begin{array}{\|r} 54 \\ 3 \\ \hline \end{array}$ |  | 25 | $\begin{aligned} & 26 \\ & 18 \end{aligned}$ | $\begin{aligned} & 27 \\ & 12 \end{aligned}$ | $\begin{array}{r} 5 \\ 15 \\ \hline \end{array}$ |  | 43 | $\begin{array}{\|r} 7 \\ 17 \\ \hline \end{array}$ | $\begin{array}{r} 41 \\ 9 \\ \hline \end{array}$ | $\begin{aligned} & 2 \\ & 6 \end{aligned}$ | 9 |
| 10 | 56 | 26 | $\left\lvert\, \begin{aligned} & 27 \\ & 21 \end{aligned}\right.$ | $\begin{aligned} & 38 \\ & 18 \end{aligned}$ | $\begin{aligned} & \mathbf{4 1} \\ & 33 \end{aligned}$ | 56 | 47 | $\begin{aligned} & 15 \\ & 20 \end{aligned}$ | $\begin{aligned} & 42 \\ & 16 \end{aligned}$ | $\begin{aligned} & \mathbf{3 1} \\ & \mathbf{2 1} \end{aligned}$ | 57 | 7 | $\begin{array}{r} \mathbf{1} \\ \mathbf{1} 9 \\ \hline \end{array}$ | $\begin{array}{\|l} 29 \\ 14 \end{array}$ | $\begin{array}{\|r} 57 \\ 1 \end{array}$ | 57 | 25 | $\begin{aligned} & 44 \\ & 18 \end{aligned}$ | $\begin{aligned} & 39 \\ & 11 \end{aligned}$ | $\begin{aligned} & 20 \\ & 12 \end{aligned}$ | 57 | 43 | $\begin{array}{\|l} 24 \\ 17 \end{array}$ | $\begin{array}{r} 50 \\ 8 \end{array}$ | $\begin{aligned} & 8 \\ & 4 \\ & \hline \end{aligned}$ |  |
| 11 |  | 26 | $\begin{array}{l\|} \hline 48 \\ 21 \end{array}$ | $\begin{aligned} & 57 \\ & 17 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 14 \\ 3^{2} \\ \hline \end{array}$ |  | 47 | $\begin{aligned} & 35 \\ & 20 \end{aligned}$ | $\begin{array}{\|l} \hline 58 \\ 15 \\ \hline \end{array}$ | $\begin{aligned} & 59 \\ & 26 \end{aligned}$ |  | 7 | $\begin{aligned} & \hline 20 \\ & 19 \\ & \hline \end{aligned}$ | $\begin{aligned} & 43 \\ & 12 \end{aligned}$ | $\begin{aligned} & 58 \\ & 58 \\ & \hline \end{aligned}$ |  | 26 | $\begin{array}{r} 2 \\ 18 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 50 \\ 10 \\ \hline \end{array}$ | $\begin{array}{r} 32 \\ \hline 9 \\ \hline \end{array}$ |  | 43 | $\begin{aligned} & \mathbf{4 1} \\ & \mathbf{1 7} \end{aligned}$ | $\begin{array}{r} 58 \\ \hline \\ \hline \end{array}$ | $\begin{gathered} 12 \\ 0 \end{gathered}$ |  |
| 12 |  | 27 | $\begin{aligned} & 10 \\ & 21 \end{aligned}$ | $\begin{aligned} & 14 \\ & 16 \end{aligned}$ | $\begin{aligned} & \hline 46 \\ & 30 \\ & \hline \end{aligned}$ |  | 47 | $\begin{aligned} & 56 \\ & 20 \end{aligned}$ | $\begin{array}{\|l\|} \hline 14 \\ 14 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 25 \\ 23 \\ \hline \end{array}$ |  | 7 | $\begin{aligned} & 39 \\ & 19 \\ & \hline \end{aligned}$ | $\begin{aligned} & 56 \\ & 11 \\ & \hline \end{aligned}$ | $\begin{aligned} & \mathbf{5 6} \\ & 55 \\ & \hline \end{aligned}$ |  | 26 | $\begin{aligned} & 21 \\ & 18 \end{aligned}$ | $\begin{aligned} & \hline \mathbf{0} \\ & 9 \\ & \hline \end{aligned}$ | $\begin{array}{r} 41 \\ \hline 6 \end{array}$ |  | 43 | $\begin{array}{\|l} 59 \\ 17 \\ \hline \end{array}$ | $\begin{aligned} & 5 \\ & 5 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 12 \\ 56 \\ \hline \end{array}$ |  |
| 13 |  | 27 | $\begin{aligned} & 31 \\ & 21 \end{aligned}$ | $\begin{aligned} & \mathbf{3 1} \\ & 15 \end{aligned}$ | $\begin{aligned} & \hline 16 \\ & 28 \\ & \hline \end{aligned}$ |  | 48 | $\begin{aligned} & 16 \\ & 20 \end{aligned}$ | $\begin{array}{\|l} \hline 28 \\ 13 \\ \hline \end{array}$ | $\begin{aligned} & \hline 48 \\ & 22 \end{aligned}$ |  | 7 | $\begin{array}{\|l} 59 \\ 19 \\ \hline \end{array}$ | $\begin{array}{\|r} 8 \\ 10 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{5 1} \\ & 53 \\ & \hline \end{aligned}$ |  | 26 | $\begin{aligned} & 39 \\ & 18 \end{aligned}$ | $\begin{aligned} & 9 \\ & 8 \end{aligned}$ | $\begin{array}{r} 47 \\ \hline \\ \hline \end{array}$ |  | 44 | $\begin{aligned} & 16 \\ & 17 \end{aligned}$ | $\begin{array}{\|r} \hline 11 \\ \hline \end{array}$ | $\begin{array}{\|r} \hline 8 \\ 54 \\ \hline \end{array}$ |  |
| 14 |  | 27 | $\begin{aligned} & 52 \\ & 21 \end{aligned}$ | $\begin{aligned} & 46 \\ & 14 \\ & \hline \end{aligned}$ | $\begin{aligned} & 44 \\ & 25 \\ & \hline \end{aligned}$ |  | 48 | $\begin{aligned} & 36 \\ & 20 \\ & \hline \end{aligned}$ | $\begin{aligned} & 42 \\ & 12 \end{aligned}$ | $\begin{array}{\|l} \hline 10 \\ 19 \\ \hline \end{array}$ |  | 8 | $\begin{aligned} & 18 \\ & 19 \\ & \hline \end{aligned}$ | $\begin{array}{r} 19 \\ \hline 9 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 44 \\ 50 \\ \hline \end{array}$ |  | 26 | $\begin{array}{\|l} 57 \\ 18 \end{array}$ | $\begin{array}{r} 17 \\ \hline \\ \hline \end{array}$ | $\begin{gathered} 50 \\ 0 \end{gathered}$ |  | 44 | $\begin{array}{\|l} 33 \\ 17 \\ \hline \end{array}$ | $\begin{array}{\|r} \hline 16 \\ 3 \\ \hline \end{array}$ | $\begin{array}{r} 2 \\ 50 \\ \hline \end{array}$ |  |
| 15 |  | 28 | $\left\lvert\, \begin{array}{l\|} 14 \\ 21 \end{array}\right.$ | $\begin{array}{\|r} \mathbf{1} \\ \mathbf{1} 3 \\ \hline \end{array}$ | $\begin{array}{r} 9 \\ 24 \\ \hline \end{array}$ |  | 48 | $\begin{aligned} & 56 \\ & 20 \end{aligned}$ | $\begin{aligned} & 54 \\ & 11 \end{aligned}$ | $\begin{aligned} & 29 \\ & 16 \\ & \hline \end{aligned}$ |  | 8 | $\begin{array}{\|l} 37 \\ 19 \\ \hline \end{array}$ | $\begin{array}{r} 29 \\ \hline 8 \end{array}$ | $\begin{array}{\|l} \mathbf{3 4} \\ 47 \\ \hline \end{array}$ |  | 27 | $\begin{aligned} & 15 \\ & 18 \end{aligned}$ | $\begin{array}{r} 24 \\ 5 \\ \hline \end{array}$ | $\begin{array}{\|} \mathbf{5 0} \\ 57 \\ \hline \end{array}$ |  | 44 | $\begin{aligned} & 50 \\ & 17 \\ & \hline \end{aligned}$ | $\begin{array}{r} 19 \\ \hline 2 \\ \hline \end{array}$ | $\begin{array}{\|l} 52 \\ 47 \\ \hline \end{array}$ |  |
| 16 |  | 28 | $\begin{array}{\|l\|} \hline 35 \\ 21 \end{array}$ | $\begin{aligned} & 14 \\ & 12 \end{aligned}$ | $\begin{aligned} & 33 \\ & 23 \\ & \hline \end{aligned}$ |  | 49 | $\begin{array}{\|l} 17 \\ 20 \end{array}$ | $\begin{array}{r} 5 \\ 10 \end{array}$ | $\begin{array}{\|l\|} \hline 45 \\ 15 \\ \hline \end{array}$ |  | 8 | $\begin{aligned} & 56 \\ & 19 \\ & \hline \end{aligned}$ | $\begin{array}{r} 38 \\ 7 \end{array}$ | $\begin{array}{\|l} \hline 21 \\ 45 \\ \hline \end{array}$ |  | 27 | $\begin{array}{\|l} 33 \\ 18 \end{array}$ | $\begin{array}{r} 30 \\ 4 \end{array}$ | $\begin{array}{\|l} \hline 47 \\ 54 \\ \hline \end{array}$ |  | 45 | $\begin{array}{r} 7 \\ 17 \\ \hline \end{array}$ | $\begin{array}{\|r} 22 \\ 1 \end{array}$ | $\begin{aligned} & 39 \\ & 43 \end{aligned}$ | 6 |
| 17 |  | 28 | $\begin{aligned} & 56 \\ & 21 \end{aligned}$ | $\begin{aligned} & 26 \\ & 11 \end{aligned}$ | $\begin{aligned} & 56 \\ & 20 \end{aligned}$ |  | 49 | $\begin{aligned} & 37 \\ & 20 \end{aligned}$ | $\begin{array}{r} 16 \\ \hline 9 \end{array}$ | $\begin{array}{r} \mathbf{0} \\ 12 \end{array}$ |  | 9 | $\begin{array}{\|l\|} 15 \\ 19 \\ \hline \end{array}$ | $\begin{array}{r} 46 \\ 6 \end{array}$ | $\begin{array}{r} 6 \\ 4^{2} \\ \hline \end{array}$ |  | 27 | $\begin{aligned} & \mathbf{5 1} \\ & \mathbf{1 8} \end{aligned}$ | $\begin{array}{r} 35 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 41 \\ 51 \\ \hline \end{array}$ |  | 45 | $\begin{array}{\|l} 24 \\ 17 \\ \hline \end{array}$ | $\begin{array}{r} 24 \\ 0 \end{array}$ | $\begin{array}{\|l} \hline 22 \\ 40 \\ \hline \end{array}$ |  |
| 18 |  | 29 | $\left\lvert\, \begin{aligned} & 17 \\ & 21 \end{aligned}\right.$ | $\begin{aligned} & 38 \\ & 10 \end{aligned}$ | $\begin{aligned} & 16 \\ & 18 \end{aligned}$ |  | 49 | $\begin{array}{\|l} 57 \\ 20 \end{array}$ | $\begin{array}{r} 25 \\ 8 \end{array}$ | $\begin{aligned} & 12 \\ & 10 \end{aligned}$ |  | 9 | $\begin{array}{r} 34 \\ 19 \\ \hline \end{array}$ | $\begin{array}{r} 5^{2} \\ 5 \\ \hline \end{array}$ | $\begin{aligned} & 48 \\ & 39 \end{aligned}$ |  | 28 | $\begin{array}{r} 9 \\ 18 \end{array}$ | $\begin{array}{r} 39 \\ 2 \end{array}$ | $\begin{aligned} & 32 \\ & 48 \\ & \hline \end{aligned}$ |  | 45 | $\begin{aligned} & 41 \\ & 16 \end{aligned}$ | $\begin{aligned} & 25 \\ & 59 \end{aligned}$ | $\begin{array}{r} \mathbf{2} \\ 37 \end{array}$ |  |
| 19 |  | 29 | $\begin{aligned} & 38 \\ & 21 \end{aligned}$ | $\begin{array}{r} 48 \\ 9 \\ \hline \end{array}$ | $\begin{aligned} & 34 \\ & 16 \\ & \hline \end{aligned}$ |  | 50 | $\begin{aligned} & 17 \\ & 20 \\ & \hline \end{aligned}$ | $33$ | $\begin{array}{r} 22 \\ \hline 7 \\ \hline \end{array}$ |  | 9 | $\begin{aligned} & 53 \\ & 19 \\ & \hline \end{aligned}$ | $\begin{array}{r} 58 \\ \hline 4 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{2 7} \\ & 37 \\ & \hline \end{aligned}$ |  | 28 | $\begin{array}{\|l} 27 \\ 18 \end{array}$ | $42$ | $\begin{array}{\|l\|} \hline 20 \\ 45 \\ \hline \end{array}$ |  | 45 | $\begin{aligned} & 58 \\ & 16 \end{aligned}$ | $\begin{aligned} & \mathbf{2 4} \\ & 58 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 39 \\ 33 \\ \hline \end{array}$ |  |
| 20 | 56 | 29 | $\begin{aligned} & 59 \\ & 21 \end{aligned}$ | $\begin{array}{r} 57 \\ 8 \end{array}$ | $\begin{aligned} & 50 \\ & 14 \end{aligned}$ | 56 | 50 | $\begin{aligned} & 37 \\ & 20 \end{aligned}$ | $\begin{array}{r} 40 \\ 6 \end{array}$ | $\begin{array}{r} 29 \\ 5 \end{array}$ | 57 | 10 | $\begin{array}{\|l} 13 \\ 19 \end{array}$ | $\begin{aligned} & 3 \\ & 3 \\ & \hline \end{aligned}$ | $\begin{array}{r} 4 \\ 34 \\ \hline \end{array}$ | 57 | 28 | $\begin{aligned} & 45 \\ & 18 \end{aligned}$ | $\begin{gathered} 44 \\ 0 \end{gathered}$ | $\begin{array}{r} 5 \\ 4^{2} \\ \hline \end{array}$ | 57 | 46 | $\begin{aligned} & 15 \\ & 16 \end{aligned}$ | $\begin{array}{\|l} \hline 23 \\ 57 \\ \hline \end{array}$ | $\begin{aligned} & 12 \\ & 30 \\ & \hline \end{aligned}$ |  |
| 21 |  | 30 | $\begin{aligned} & 21 \\ & 21 \end{aligned}$ | $\begin{aligned} & \hline 6 \\ & 7 \\ & \hline \end{aligned}$ | $\begin{array}{r} 4 \\ 13 \\ \hline \end{array}$ |  | 50 | $\begin{array}{\|l} 57 \\ 20 \end{array}$ | $\begin{array}{r} 46 \\ \hline \\ \hline \end{array}$ | $34$ |  | 10 | $\begin{aligned} & 32 \\ & 19 \\ & \hline \end{aligned}$ | $\begin{aligned} & \hline 6 \\ & 2 \end{aligned}$ | $\begin{aligned} & 38 \\ & 31 \end{aligned}$ |  | 29 | $\begin{array}{\|r} 3 \\ 17 \\ \hline \end{array}$ | $\begin{array}{r} 44 \\ 59 \\ \hline \end{array}$ | $\begin{aligned} & 47 \\ & 38 \\ & \hline \end{aligned}$ |  | 46 | $\begin{aligned} & 32 \\ & 16 \end{aligned}$ | $\begin{array}{\|l} \hline 20 \\ 56 \\ \hline \end{array}$ | $\begin{array}{\|l} 42 \\ 27 \\ \hline \end{array}$ |  |
| 22 |  | 30 | $\begin{aligned} & 42 \\ & 21 \end{aligned}$ | $\begin{array}{r} 13 \\ 6 \end{array}$ | $\begin{aligned} & 17 \\ & 10 \end{aligned}$ |  | 51 | $\begin{aligned} & 17 \\ & 20 \end{aligned}$ | $\begin{array}{r} 51 \\ \hline 4 \\ \hline \end{array}$ | $\begin{array}{r} 37 \\ 1 \end{array}$ |  | 10 | $\begin{aligned} & \mathbf{5 1} \\ & \mathbf{1 9} \end{aligned}$ | $9$ | $\begin{array}{r} 9 \\ 28 \end{array}$ |  | 29 | $\begin{array}{\|l} \mathbf{2 1} \\ 17 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 44 \\ 58 \\ \hline \end{array}$ | $\begin{aligned} & 25 \\ & 36 \\ & \hline \end{aligned}$ |  | 46 | $\begin{aligned} & 49 \\ & 16 \end{aligned}$ | $\begin{array}{\|l\|} \hline \mathbf{1 7} \\ 55 \\ \hline \end{array}$ | $\begin{array}{\|r} 9 \\ 23 \\ \hline \end{array}$ |  |
| 23 |  | 31 | $\begin{array}{r} 3 \\ 21 \end{array}$ | $\begin{array}{r} 19 \\ \hline \end{array}$ | $\begin{array}{r} 27 \\ \hline 8 \end{array}$ |  | 51 | $\begin{aligned} & 37 \\ & 20 \end{aligned}$ | $55$ | $\begin{array}{\|l} \hline 38 \\ 58 \\ \hline \end{array}$ |  | 11 | $\begin{aligned} & \hline 10 \\ & 19 \\ & \hline \end{aligned}$ | $\begin{gathered} 10 \\ 0 \end{gathered}$ | $\begin{aligned} & 37 \\ & 26 \end{aligned}$ |  | 29 | $\begin{aligned} & 39 \\ & 17 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 43 \\ 57 \\ \hline \end{array}$ | $\begin{array}{\|r} \hline \mathbf{1} \\ 33 \\ \hline \end{array}$ |  | 47 | $\begin{array}{r} 6 \\ 16 \end{array}$ | $\begin{array}{\|l\|} \hline 12 \\ 54 \\ \hline \end{array}$ | $\begin{aligned} & 32 \\ & 20 \end{aligned}$ |  |
| 24 |  | 31 | $\begin{array}{l\|} 24 \\ 21 \end{array}$ | $\begin{array}{r} 24 \\ \hline 4 \\ \hline \end{array}$ | $\begin{array}{r} \hline 35 \\ \hline \end{array}$ |  | 51 | $\begin{aligned} & 57 \\ & 20 \end{aligned}$ | $\begin{gathered} 58 \\ 1 \end{gathered}$ | $\begin{array}{\|l} \hline 36 \\ 55 \\ \hline \end{array}$ |  | 11 | $\begin{aligned} & 29 \\ & 18 \end{aligned}$ | $\begin{array}{\|l\|} \mathbf{1 1} \\ 59 \\ \hline \end{array}$ | $\begin{array}{r} 3 \\ 23 \\ \hline \end{array}$ |  | 29 | $\begin{array}{\|l} 57 \\ 17 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 40 \\ 56 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 34 \\ 30 \\ \hline \end{array}$ |  | 47 | $\begin{aligned} & 23 \\ & 16 \end{aligned}$ | $\begin{array}{\|r} \hline 6 \\ 53 \\ \hline \end{array}$ | $\begin{aligned} & 52 \\ & 16 \end{aligned}$ |  |
| 25 |  | 31 | $\begin{aligned} & 45 \\ & 21 \end{aligned}$ | $\begin{array}{\|r} \hline 28 \\ \hline \end{array}$ | $\begin{array}{r} 42 \\ \hline 4 \\ \hline \end{array}$ |  | 52 | $\begin{aligned} & 18 \\ & 20 \end{aligned}$ | $\begin{aligned} & 0 \\ & 0 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline \mathbf{3 1} \\ 54 \\ \hline \end{array}$ |  | 11 | $\begin{aligned} & 48 \\ & 18 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|l\|} \hline \mathbf{1 0} \\ 58 \\ \hline \end{array}$ | $\begin{aligned} & 26 \\ & 21 \end{aligned}$ |  | 30 | $\begin{aligned} & 15 \\ & 17 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 37 \\ 55 \\ \hline \end{array}$ | $\begin{array}{r} 4 \\ 26 \end{array}$ |  | 47 | $\begin{aligned} & 40 \\ & 16 \end{aligned}$ | $\begin{array}{\|r} \hline \mathbf{0} \\ 5^{2} \\ \hline \end{array}$ | $\begin{array}{\|r} \hline 8 \\ 14 \\ \hline \end{array}$ | 5 |
| 26 |  | 32 | $\begin{array}{r} 6 \\ 21 \end{array}$ | $\begin{array}{r} 31 \\ 2 \end{array}$ | $\begin{array}{r} 46 \\ 2 \end{array}$ |  | 52 | $\begin{aligned} & 38 \\ & 19 \end{aligned}$ | $\begin{array}{\|r} \mathbf{1} \\ 59 \\ \hline \end{array}$ | $\begin{aligned} & 25 \\ & 51 \\ & \hline \end{aligned}$ |  | 12 | $\begin{array}{r} 7 \\ 18 \\ \hline \end{array}$ | $\begin{array}{r} 8 \\ 57 \\ \hline \end{array}$ | $\begin{array}{\|l} 47 \\ 17 \\ \hline \end{array}$ |  | 30 | $\begin{array}{\|l} 33 \\ 17 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline \mathbf{3 2}^{2} \\ 54 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 30 \\ 24 \\ \hline \end{array}$ |  | 47 | $\begin{array}{l\|} \hline 56 \\ 16 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 52 \\ 51 \\ \hline \end{array}$ | $\begin{array}{r} 22 \\ \hline 9 \\ \hline \end{array}$ | 6 |
| 27 |  | 32 | $\begin{aligned} & 27 \\ & 21 \end{aligned}$ | $\begin{gathered} 33 \\ 1 \end{gathered}$ | $\begin{array}{r} 48 \\ \hline \end{array}$ |  | 52 | $\begin{aligned} & 58 \\ & 19 \end{aligned}$ | $\begin{array}{\|r} \mathbf{1} \\ 5^{8} \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 16 \\ 48 \\ \hline \end{array}$ |  | 12 | $\begin{aligned} & 26 \\ & 18 \\ & \hline \end{aligned}$ | $\begin{array}{r} 6 \\ 56 \\ \hline \end{array}$ | $\begin{array}{r} 4 \\ 15 \\ \hline \end{array}$ |  | 30 | $\begin{array}{\|l} \mathbf{5 1} \\ \mathbf{1 7} \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{2 6} \\ & 53 \\ & \hline \end{aligned}$ | $\begin{aligned} & 54 \\ & 20 \end{aligned}$ |  | 48 | $\begin{aligned} & 13 \\ & 16 \end{aligned}$ | $\begin{array}{\|l} \hline 43 \\ 50 \\ \hline \end{array}$ | $\begin{array}{r} \mathbf{3 1} \\ \hline \end{array}$ | 7 |
| 28 |  | 32 | $\begin{aligned} & 48 \\ & 20 \end{aligned}$ | $\begin{aligned} & 34 \\ & 59 \end{aligned}$ | $\begin{aligned} & 49 \\ & 58 \\ & \hline \end{aligned}$ |  | 53 | $\begin{aligned} & 18 \\ & 19 \end{aligned}$ | $\begin{array}{\|r} \hline \mathbf{o} \\ 57 \\ \hline \end{array}$ | $\begin{array}{r} 4 \\ 46 \\ \hline \end{array}$ |  | 12 | $\begin{aligned} & 45 \\ & 18 \end{aligned}$ | $\begin{array}{\|r} \hline \mathbf{2} \\ 55 \\ \hline \end{array}$ | $\begin{aligned} & 19 \\ & 12 \end{aligned}$ |  | 31 | $\begin{array}{r} 9 \\ 17 \\ \hline \end{array}$ | $\begin{array}{\|l} 20 \\ 52 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 14 \\ 18 \\ \hline \end{array}$ |  | 48 | $\begin{aligned} & 30 \\ & 16 \end{aligned}$ | $\begin{aligned} & 33 \\ & 49 \\ & \hline \end{aligned}$ | $\begin{array}{\|r} \hline 38 \\ 3 \\ \hline \end{array}$ | 8 |
| 29 |  | 33 | $\begin{array}{r} 9 \\ 20 \end{array}$ | $\begin{array}{\|l} 34 \\ 58 \\ \hline \end{array}$ | $\begin{aligned} & 47 \\ & 56 \\ & \hline \end{aligned}$ |  | 53 | $\begin{aligned} & 37 \\ & 19 \\ & \hline \end{aligned}$ | $\begin{aligned} & 57 \\ & 56 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 50 \\ 44 \\ \hline \end{array}$ |  | 13 | $\begin{array}{r} 3 \\ 18 \\ \hline \end{array}$ | $\begin{array}{\|l} \mathbf{5 7} \\ 54 \\ \hline \end{array}$ | $\left\lvert\, \begin{aligned} & 31 \\ & 10 \end{aligned}\right.$ |  | 31 | $\begin{array}{\|l} 27 \\ 17 \\ \hline \end{array}$ | $\begin{array}{\|l} 12 \\ 51 \\ \hline \end{array}$ | $\begin{aligned} & 3^{2} \\ & 14 \\ & \hline \end{aligned}$ |  | 48 | $\begin{aligned} & 47 \\ & 16 \end{aligned}$ | $\begin{array}{\|l} 22 \\ 47 \\ \hline \end{array}$ | $\begin{array}{\|l} \mathbf{4 1} \\ \mathbf{5 9} \\ \hline \end{array}$ |  |
| 30 | 56 | 33 | $\begin{aligned} & 30 \\ & 20 \end{aligned}$ | $\begin{array}{\|l} 33 \\ 57 \\ \hline \end{array}$ | $\begin{array}{r} 43 \\ 55 \\ \hline \end{array}$ | 56 | 53 | $\begin{array}{\|l} 57 \\ 19 \\ \hline \end{array}$ | $\begin{aligned} & 54 \\ & 55 \\ & \hline \end{aligned}$ | $\begin{aligned} & 34 \\ & 42 \end{aligned}$ | 57 | 13 | $\begin{aligned} & 22 \\ & 18 \end{aligned}$ | $\begin{array}{\|l} \mathbf{5 1} \\ 53 \end{array}$ | $\begin{array}{\|r} 41 \\ 7 \end{array}$ | 57 | $3^{1}$ | $\begin{array}{\|l\|} \hline 45 \\ 17 \end{array}$ | $\begin{array}{r} 3 \\ 50 \\ \hline \end{array}$ | $\begin{aligned} & \hline 46 \\ & 11 \end{aligned}$ | 57 | 49 | $\begin{array}{r} 4 \\ 16 \end{array}$ | $\begin{aligned} & 10 \\ & 46 \end{aligned}$ | $\begin{aligned} & 40 \\ & 57 \\ & \hline \end{aligned}$ |  |

Bürgi's 1' sine table (reconstruction, D. Roegel, 2016)

| 1 | $70^{\circ}$ |  |  |  |  | $71^{\circ}$ |  |  |  |  | $72^{\circ}$ |  |  |  |  | $73^{\circ}$ |  |  |  |  | $74^{\circ}$ |  |  |  |  | , |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 30 | 56 | 33 | $\begin{array}{\|l\|} \hline 30 \\ 20 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 33 \\ 57 \\ \hline \end{array}$ | $\begin{aligned} & 43 \\ & 55 \\ & \hline \end{aligned}$ | 56 | 53 | $\begin{aligned} & \hline 57 \\ & 19 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \mathbf{5 4} \\ 55 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 34 \\ 42 \\ \hline \end{array}$ | 57 | 13 | $\begin{array}{\|l} 22 \\ 18 \end{array}$ | $\begin{array}{\|l\|} \hline \mathbf{5 1} \\ 53 \\ \hline \end{array}$ | $\begin{array}{r} \hline \mathbf{4 1} \\ 7 \\ \hline \end{array}$ | 57 | 31 | $\begin{array}{\|l\|} \hline 45 \\ 17 \\ \hline \end{array}$ | $\begin{array}{r} 3 \\ 50 \\ \hline \end{array}$ | $\begin{aligned} & \hline 46 \\ & 11 \\ & \hline \end{aligned}$ | 57 | 49 | $\begin{array}{r} 4 \\ 16 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 10 \\ 46 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline \mathbf{4 0} \\ 57 \\ \hline \end{array}$ | 30 |
| 31 |  | 33 | $\begin{aligned} & \hline 51 \\ & 20 \end{aligned}$ | $\begin{array}{\|l\|l\|} \hline \mathbf{3 1} \\ 56 \\ \hline \end{array}$ | $\begin{aligned} & 38 \\ & 5^{2} \\ & \hline \end{aligned}$ |  | 54 | $\begin{array}{\|l} 17 \\ 19 \\ \hline \end{array}$ | $\begin{aligned} & 50 \\ & 54 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline \mathbf{1 6} \\ 39 \\ \hline \end{array}$ |  | 13 | $\begin{aligned} & \mathbf{4 1} \\ & \mathbf{1 8} \end{aligned}$ | $\begin{aligned} & 44 \\ & 52 \\ & \hline \end{aligned}$ | $48$ |  | 32 | $\begin{array}{r} 2 \\ 17 \\ \hline \end{array}$ | $\begin{array}{\|l} 53 \\ 49 \\ \hline \end{array}$ | $\begin{array}{\|r} 57 \\ 8 \end{array}$ |  | 49 | $\begin{aligned} & 20 \\ & 16 \end{aligned}$ | $\begin{aligned} & 57 \\ & 45 \\ & \hline \end{aligned}$ | $\begin{aligned} & 37 \\ & 52 \end{aligned}$ | 31 |
| 32 |  | 34 | $\begin{aligned} & 12 \\ & 20 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 28 \\ 55 \\ \hline \end{array}$ | $\begin{aligned} & 30 \\ & 50 \\ & \hline \end{aligned}$ |  | 54 | $\begin{aligned} & 37 \\ & 19 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 44 \\ 53 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 55 \\ 36 \\ \hline \end{array}$ |  | 14 | $\begin{array}{r} \mathbf{0} \\ 18 \\ \hline \end{array}$ | $\begin{aligned} & \hline 36 \\ & 51 \\ & \hline \end{aligned}$ | $\begin{array}{r} 51 \\ 2 \end{array}$ |  | 32 | $\begin{array}{\|l\|} \hline 20 \\ 17 \\ \hline \end{array}$ | $\begin{array}{\|l} 43 \\ 48 \\ \hline \end{array}$ | $\begin{aligned} & 5 \\ & 5 \\ & \hline \end{aligned}$ |  | 49 | $\begin{aligned} & 37 \\ & 16 \end{aligned}$ | $\begin{array}{r} 43 \\ 44 \\ \hline \end{array}$ | $\begin{aligned} & 29 \\ & 50 \\ & \hline \end{aligned}$ | 32 |
| 33 |  | 34 | $\begin{aligned} & 33 \\ & 20 \end{aligned}$ | $\begin{array}{\|l} \mathbf{2 4} \\ 54 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{2 0} \\ & 49 \end{aligned}$ |  | 54 | $\begin{aligned} & 57 \\ & 19 \\ & \hline \end{aligned}$ | $\begin{aligned} & 38 \\ & 5^{2} \end{aligned}$ | $\begin{aligned} & \mathbf{3 1} \\ & \mathbf{3 5} \\ & \hline \end{aligned}$ |  | 14 | $\begin{aligned} & 19 \\ & 18 \end{aligned}$ | $\begin{array}{r} \mathbf{2 7} \\ 49 \\ \hline \end{array}$ | $\begin{array}{\|l} 53 \\ 58 \\ \hline \end{array}$ |  | 32 | $\begin{aligned} & 38 \\ & 17 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \mathbf{3 1} \\ 47 \\ \hline \end{array}$ | $\begin{array}{r} 10 \\ 2 \end{array}$ |  | 49 | $\left(\begin{array}{l} 54 \\ 16 \end{array}\right.$ | $\begin{aligned} & \hline \mathbf{2 8} \\ & 43 \\ & \hline \end{aligned}$ | $\begin{aligned} & 19 \\ & 46 \end{aligned}$ | 33 |
| 34 |  | 34 | $\begin{aligned} & 54 \\ & 20 \end{aligned}$ | $\begin{array}{\|l\|} \hline 19 \\ 53 \\ \hline \end{array}$ | $\begin{array}{r} 9 \\ 46 \\ \hline \end{array}$ |  | 55 | $\begin{array}{\|l} \mathbf{1 7} \\ 19 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 31 \\ 51 \\ \hline \end{array}$ | $\begin{array}{r} 6 \\ 31 \\ \hline \end{array}$ |  | 14 | $\begin{aligned} & 38 \\ & 18 \end{aligned}$ | $\begin{array}{\|l} \mathbf{1 7} \\ 48 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \mathbf{5 1} \\ 56 \\ \hline \end{array}$ |  | 32 | $\begin{aligned} & 56 \\ & 17 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline \mathbf{1 8} \\ 45 \\ \hline \end{array}$ | $\begin{array}{\|l} \mathbf{1 2} \\ 59 \\ \hline \end{array}$ |  | 50 | $\begin{aligned} & 11 \\ & 16 \end{aligned}$ | $\begin{aligned} & 12 \\ & 42 \end{aligned}$ | $\begin{array}{r} 5 \\ 4^{2} \\ \hline \end{array}$ | 34 |
| 35 |  | 35 | $\begin{array}{\|l\|} \hline 15 \\ 20 \end{array}$ | $\begin{aligned} & 12 \\ & 52 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 55 \\ 44 \\ \hline \end{array}$ |  | 55 | $\begin{aligned} & 37 \\ & 19 \\ & \hline \end{aligned}$ | $\begin{aligned} & 22 \\ & 50 \\ & \hline \end{aligned}$ | $\begin{aligned} & 37 \\ & 30 \\ & \hline \end{aligned}$ |  | 14 | $\begin{array}{\|l} 57 \\ 18 \end{array}$ | $\begin{array}{r} 6 \\ 47 \end{array}$ | $\begin{aligned} & 47 \\ & 52 \\ & \hline \end{aligned}$ |  | 33 | $\begin{array}{\|l} 14 \\ 17 \\ \hline \end{array}$ | $\begin{array}{r} 4 \\ 44 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \mathbf{1 1} \\ 56 \\ \hline \end{array}$ |  | 50 | $\begin{aligned} & 27 \\ & 16 \end{aligned}$ | $\begin{aligned} & 54 \\ & 41 \end{aligned}$ | $\begin{array}{\|l} 47 \\ 39 \\ \hline \end{array}$ | 35 |
| 36 |  | 35 | $\begin{aligned} & 36 \\ & 20 \end{aligned}$ | $\begin{array}{r} 5 \\ 51 \end{array}$ | $\begin{array}{\|l} 39 \\ 4^{2} \\ \hline \end{array}$ |  | 55 | $\begin{aligned} & 57 \\ & 19 \end{aligned}$ | $\begin{array}{\|l} \mathbf{1 3} \\ 49 \\ \hline \end{array}$ | $\begin{array}{r} 7 \\ 27 \\ \hline \end{array}$ |  | 15 | $\begin{aligned} & 15 \\ & 18 \end{aligned}$ | $\begin{aligned} & 54 \\ & 46 \end{aligned}$ | $\begin{aligned} & 39 \\ & 50 \end{aligned}$ |  | 33 | $\begin{array}{\|l\|} \hline \mathbf{3 1} \\ \mathbf{1} 7 \\ \hline \end{array}$ | $\begin{aligned} & 49 \\ & 43 \end{aligned}$ | $\begin{array}{r} 7 \\ 52 \\ \hline \end{array}$ |  | 50 | $\begin{aligned} & 44 \\ & 16 \end{aligned}$ | $\begin{aligned} & 36 \\ & 40 \end{aligned}$ | $\begin{aligned} & 26 \\ & 36 \end{aligned}$ | 36 |
| 37 |  | 35 | $\begin{aligned} & 56 \\ & 20 \end{aligned}$ | $\begin{aligned} & 57 \\ & 50 \\ & \hline \end{aligned}$ | $\begin{aligned} & 21 \\ & 40 \end{aligned}$ |  | 56 | $\begin{array}{\|l} 17 \\ 19 \\ \hline \end{array}$ | $\begin{array}{\|r} \hline 2 \\ 4^{8} \\ \hline \end{array}$ | $\begin{aligned} & 34 \\ & 24 \\ & \hline \end{aligned}$ |  | 15 | $\begin{aligned} & 34 \\ & 18 \end{aligned}$ | $\begin{array}{\|l\|} \hline \mathbf{4 1} \\ \mathbf{4 5} \\ \hline \end{array}$ | $\begin{aligned} & 29 \\ & 48 \\ & \hline \end{aligned}$ |  | 33 | $\begin{aligned} & 49 \\ & 17 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 3^{2} \\ 42 \\ \hline \end{array}$ | $\begin{array}{\|l} 59 \\ 50 \\ \hline \end{array}$ |  | 51 | $\begin{array}{r} 1 \\ 16 \end{array}$ | $\begin{aligned} & \hline \mathbf{1 7} \\ & 39 \\ & \hline \end{aligned}$ | $\begin{array}{r} 2 \\ 32 \\ \hline \end{array}$ | 37 |
| $3^{8}$ |  | $3^{6}$ | $\begin{array}{\|l} 17 \\ 20 \end{array}$ | $\begin{aligned} & 48 \\ & 49 \end{aligned}$ | $\begin{array}{r} \mathbf{1} \\ \mathbf{3}^{8} \end{array}$ |  | 56 | $\begin{aligned} & 36 \\ & 19 \end{aligned}$ | $\begin{array}{\|l} 50 \\ 47 \\ \hline \end{array}$ | $\begin{aligned} & 5^{8} \\ & 22 \end{aligned}$ |  | 15 | $\begin{array}{\|l} 53 \\ 18 \end{array}$ | $\begin{array}{r} \mathbf{2 7} \\ 44 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{1 7} \\ & 44 \end{aligned}$ |  | 34 | $\begin{array}{\|r} 7 \\ 17 \\ \hline \end{array}$ | $\begin{array}{\|l} 15 \\ 41 \\ \hline \end{array}$ | $\begin{array}{\|l} 49 \\ 46 \\ \hline \end{array}$ |  | 51 | $\begin{aligned} & 17 \\ & 16 \end{aligned}$ | $\begin{aligned} & 56 \\ & 38 \end{aligned}$ | $\begin{array}{\|l} \mathbf{3 4} \\ 29 \\ \hline \end{array}$ | $3^{8}$ |
| 39 |  | 36 | $\begin{aligned} & 38 \\ & 20 \end{aligned}$ | $\begin{aligned} & 37 \\ & 48 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 39 \\ 36 \\ \hline \end{array}$ |  | 56 | $\begin{aligned} & 56 \\ & 19 \end{aligned}$ | $\begin{aligned} & 38 \\ & 46 \end{aligned}$ | $\begin{aligned} & 20 \\ & 20 \end{aligned}$ |  | 16 | $\begin{array}{\|l} 12 \\ 18 \end{array}$ | $\begin{array}{\|l} \hline \mathbf{1 2} \\ 43 \\ \hline \end{array}$ | $\begin{array}{r} 1 \\ 42 \\ \hline \end{array}$ |  | 34 | $\begin{array}{\|} \mathbf{2 4} \\ 17 \\ \hline \end{array}$ | $\begin{array}{\|l} 57 \\ 40 \\ \hline \end{array}$ | $\begin{array}{\|l} 35 \\ 43 \\ \hline \end{array}$ |  | 51 | $\begin{aligned} & 34 \\ & 16 \end{aligned}$ | $\begin{array}{\|l\|} \hline 35 \\ 37 \\ \hline \end{array}$ | $\begin{array}{\|r} 3 \\ 25 \\ \hline \end{array}$ | 39 |
| 40 | 56 | $3^{6}$ | $\begin{aligned} & 59 \\ & 20 \end{aligned}$ | $\begin{aligned} & \mathbf{2 6} \\ & 47 \end{aligned}$ | $\begin{aligned} & \hline 15 \\ & 33 \end{aligned}$ | 56 | 57 | $\begin{aligned} & 16 \\ & 19 \\ & \hline \end{aligned}$ | $\begin{array}{\|} 24 \\ 45 \\ \hline \end{array}$ | $\begin{aligned} & 40 \\ & 17 \end{aligned}$ | 57 | 16 | $\begin{aligned} & 30 \\ & 18 \end{aligned}$ | $\begin{array}{\|} 55 \\ 42 \\ \hline \end{array}$ | $\begin{aligned} & 43 \\ & 39 \end{aligned}$ | 57 | 34 | $\begin{aligned} & 42 \\ & 17 \end{aligned}$ | $\begin{array}{\|l\|} \hline \mathbf{3 8} \\ 39 \end{array}$ | $\begin{array}{\|l} \hline 18 \\ 40 \\ \hline \end{array}$ | 57 | 51 | $\begin{aligned} & \mathbf{5 1} \\ & 16 \end{aligned}$ | $\begin{aligned} & 12 \\ & 36 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 28 \\ 22 \end{array}$ | 40 |
| 41 |  | 37 | $\begin{array}{l\|} 20 \\ 20 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 13 \\ 46 \\ \hline \end{array}$ | $\begin{aligned} & 4^{8} \\ & 3^{2} \\ & \hline \end{aligned}$ |  | 57 | $\begin{aligned} & 36 \\ & 19 \\ & \hline \end{aligned}$ | $\begin{array}{r} \hline 9 \\ 44 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 57 \\ 14 \\ \hline \end{array}$ |  | 16 | $\begin{aligned} & 49 \\ & 18 \end{aligned}$ | $\begin{array}{\|l\|} \hline 3^{8} \\ 41 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 22 \\ 36 \\ \hline \end{array}$ |  | 35 | $\begin{array}{\|r} \hline \mathbf{o} \\ 17 \\ \hline \end{array}$ | $\begin{aligned} & 17 \\ & 38 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 58 \\ 37 \\ \hline \end{array}$ |  | 52 | $\begin{array}{r} 7 \\ 16 \end{array}$ | $\begin{aligned} & 48 \\ & 35 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 50 \\ 19 \\ \hline \end{array}$ | 41 |
| 42 |  | 37 | $\begin{aligned} & 41 \\ & 20 \\ & \hline \end{aligned}$ | $\begin{array}{\|r} \hline \mathbf{o} \\ 45 \\ \hline \end{array}$ | $\begin{aligned} & 20 \\ & 29 \\ & \hline \end{aligned}$ |  | 57 | $\begin{aligned} & 55 \\ & 19 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 54 \\ 43 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 11 \\ 13 \\ \hline \end{array}$ |  | 17 | $\begin{array}{r} 8 \\ 18 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 19 \\ 40 \\ \hline \end{array}$ | $\begin{aligned} & 58 \\ & 33 \\ & \hline \end{aligned}$ |  | 35 | $\begin{array}{\|l\|} \hline \mathbf{1 7} \\ 17 \\ \hline \end{array}$ | $\begin{aligned} & 56 \\ & 37 \\ & \hline \end{aligned}$ | $\begin{aligned} & 35 \\ & 34 \\ & \hline \end{aligned}$ |  | 52 | $\begin{aligned} & 24 \\ & 16 \end{aligned}$ | $\begin{aligned} & 24 \\ & 34 \\ & \hline \end{aligned}$ | $\begin{array}{\|r} 9 \\ 15 \\ \hline \end{array}$ | 42 |
| 43 |  | $3^{8}$ | $20$ | $\begin{aligned} & 45 \\ & 44 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 49 \\ 28 \end{array}$ |  | 58 | $\begin{aligned} & 15 \\ & 19 \end{aligned}$ | $\begin{array}{\|l} 37 \\ 4^{2} \\ \hline \end{array}$ | $\begin{array}{r} 24 \\ 9 \end{array}$ |  | 17 | $\begin{aligned} & 27 \\ & 18 \end{aligned}$ | $\begin{array}{r} \hline \mathbf{o} \\ 39 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline \mathbf{3 1} \\ 30 \\ \hline \end{array}$ |  | 35 | $\begin{aligned} & 35 \\ & 17 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 34 \\ 36 \\ \hline \end{array}$ | $\begin{array}{r} 9 \\ 30 \\ \hline \end{array}$ |  | 52 | $\begin{aligned} & 40 \\ & 16 \end{aligned}$ | $\begin{aligned} & \mathbf{5 8} \\ & 33 \end{aligned}$ | $\begin{array}{\|l\|} 24 \\ 11 \\ \hline \end{array}$ | 43 |
| 44 |  | 38 | $\begin{aligned} & 22 \\ & 20 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 30 \\ 43 \\ \hline \end{array}$ | $\begin{aligned} & 17 \\ & 25 \\ & \hline \end{aligned}$ |  | 58 | $\begin{aligned} & 35 \\ & 19 \end{aligned}$ | $\begin{array}{\|l\|} \hline 19 \\ 4^{1} \\ \hline \end{array}$ | $\begin{array}{r} 33 \\ 8 \end{array}$ |  | 17 | $\begin{aligned} & 45 \\ & 18 \end{aligned}$ | $\begin{aligned} & 40 \\ & 38 \\ & \hline \end{aligned}$ | $\begin{array}{r} 1 \\ \mathbf{2} 8 \end{array}$ |  | 35 | $\begin{array}{\|l\|} \hline 53 \\ 17 \\ \hline \end{array}$ | $\begin{aligned} & 10 \\ & 35 \end{aligned}$ | $\begin{aligned} & 39 \\ & 28 \\ & \hline \end{aligned}$ |  | 52 | $\begin{aligned} & 57 \\ & 16 \end{aligned}$ | $\begin{aligned} & 31 \\ & 32 \\ & \hline \end{aligned}$ | $\begin{array}{\|r} 35 \\ \hline \end{array}$ | 44 |
| 45 |  | $3^{8}$ | $\begin{array}{\|l\|} \hline 43 \\ 20 \end{array}$ | $\begin{aligned} & 13 \\ & 42 \\ & \hline \end{aligned}$ | $\begin{aligned} & 42 \\ & \mathbf{2 3} \\ & \hline \end{aligned}$ |  | 58 | $\begin{aligned} & 55 \\ & 19 \end{aligned}$ | $\begin{array}{\|c} \hline \mathbf{o} \\ 4^{0} \\ \hline \end{array}$ | $\begin{array}{r} 41 \\ 4 \\ \hline \end{array}$ |  | 18 | $\begin{array}{r} 4 \\ 18 \end{array}$ | $\begin{array}{\|l\|} \hline 18 \\ 37 \\ \hline \end{array}$ | $\begin{aligned} & 29 \\ & 25 \\ & \hline \end{aligned}$ |  | $3^{6}$ | $\begin{array}{\|l\|l\|} \hline 10 \\ 17 \\ \hline \end{array}$ | $\begin{aligned} & 46 \\ & 34 \\ & \hline \end{aligned}$ | $\begin{array}{r} 7 \\ 24 \\ \hline \end{array}$ |  | 53 | $\begin{aligned} & 14 \\ & 16 \end{aligned}$ | $\begin{array}{r} 3 \\ 31 \\ \hline \end{array}$ | $\begin{array}{\|r} 43 \\ 5 \end{array}$ | 45 |
| 46 |  | 39 | $\begin{array}{r} 3 \\ 20 \end{array}$ | $\begin{aligned} & 56 \\ & 41 \\ & \hline \end{aligned}$ | $\begin{array}{r} 5 \\ 22 \end{array}$ |  | 59 | $\begin{array}{\|l} 14 \\ 19 \end{array}$ | $\begin{aligned} & 40 \\ & 39 \end{aligned}$ | $45$ |  | 18 | $\begin{aligned} & 22 \\ & 18 \end{aligned}$ | $\begin{array}{\|l} \hline 55 \\ 36 \\ \hline \end{array}$ | $54$ |  | $3^{6}$ | $\begin{aligned} & 28 \\ & 17 \end{aligned}$ | $\begin{array}{\|l} 20 \\ 33 \\ \hline \end{array}$ | $\begin{aligned} & 31 \\ & 21 \end{aligned}$ |  | 53 | $\begin{aligned} & 30 \\ & 16 \end{aligned}$ | $\begin{aligned} & \mathbf{3 4} \\ & 30 \\ & \hline \end{aligned}$ | $48$ | 46 |
| 47 |  | 39 | $\begin{array}{\|l\|} \hline 24 \\ 20 \end{array}$ | $\begin{aligned} & 37 \\ & 40 \end{aligned}$ | $\begin{array}{\|l\|} \hline 27 \\ 18 \end{array}$ |  | 59 | $\begin{aligned} & 34 \\ & 19 \end{aligned}$ | $\begin{aligned} & \mathbf{1 9} \\ & 37 \end{aligned}$ | $\begin{array}{\|l} \hline 48 \\ 59 \\ \hline \end{array}$ |  | 18 | $\begin{aligned} & \mathbf{4 1} \\ & \mathbf{1 8} \end{aligned}$ | $\begin{array}{\|l\|} \hline \mathbf{3 2} \\ 35 \\ \hline \end{array}$ | $\begin{array}{\|l} 15 \\ 19 \\ \hline \end{array}$ |  | 36 | $\begin{aligned} & 45 \\ & 17 \end{aligned}$ | $\begin{array}{\|l} 53 \\ 32 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 52 \\ 18 \end{array}$ |  | 53 | $\begin{aligned} & 47 \\ & 16 \end{aligned}$ | $\begin{array}{r} 4 \\ 28 \end{array}$ | $49$ | 47 |
| 48 |  | 39 | $\begin{aligned} & 45 \\ & 20 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline \mathbf{1 7} \\ \mathbf{3 9} \\ \hline \end{array}$ | $\begin{aligned} & 45 \\ & 17 \\ & \hline \end{aligned}$ |  | 59 | $\begin{aligned} & 53 \\ & 19 \end{aligned}$ | $\begin{array}{\|l} 57 \\ 36 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 47 \\ 58 \\ \hline \end{array}$ |  | 19 | $\begin{array}{r} \mathbf{0} \\ 18 \\ \hline \end{array}$ | $\begin{array}{\|r} 7 \\ 34 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 34 \\ 17 \\ \hline \end{array}$ |  | 37 | $\begin{array}{r} 3 \\ 17 \\ \hline \end{array}$ | $\begin{aligned} & 26 \\ & 31 \end{aligned}$ | $\begin{array}{\|l} \hline 10 \\ 15 \\ \hline \end{array}$ |  | 54 | $\begin{array}{r} 3 \\ 16 \end{array}$ | $\begin{aligned} & \hline 33 \\ & 27 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 46 \\ 54 \\ \hline \end{array}$ | 48 |
| 49 |  | 40 | $\begin{array}{r} 5 \\ 20 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 57 \\ 38 \\ \hline \end{array}$ | $\begin{array}{\|r} \hline 2 \\ 15 \\ \hline \end{array}$ | 57 | 0 | $\begin{aligned} & 13 \\ & 19 \end{aligned}$ | $\begin{array}{\|l\|} \hline 34 \\ 35 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 45 \\ 54 \\ \hline \end{array}$ |  | 19 | $\begin{aligned} & 18 \\ & 18 \end{aligned}$ | $\begin{array}{\|l} \hline \mathbf{4 1} \\ 33 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 51 \\ 13 \\ \hline \end{array}$ |  | 37 | $\begin{array}{\|l} \hline 20 \\ 17 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 57 \\ 30 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 25 \\ 11 \\ \hline \end{array}$ |  | 54 | $\begin{aligned} & 20 \\ & 16 \\ & \hline \end{aligned}$ | $\begin{array}{r} 1 \\ 26 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 40 \\ 51 \\ \hline \end{array}$ | 49 |
| 50 | 56 | 40 | $\begin{aligned} & 26 \\ & 20 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 35 \\ 37 \\ \hline \end{array}$ | $\begin{aligned} & 17 \\ & 12 \end{aligned}$ | 57 | 0 | $\begin{aligned} & 33 \\ & 19 \end{aligned}$ | $\begin{aligned} & 10 \\ & 34 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 39 \\ 52 \\ \hline \end{array}$ | 57 | 19 | $\begin{aligned} & 37 \\ & 18 \end{aligned}$ | $\begin{aligned} & 15 \\ & 3^{2} \\ & \hline \end{aligned}$ | $\begin{array}{r} 4 \\ 10 \\ \hline \end{array}$ | 57 | 37 | $\begin{aligned} & 38 \\ & 17 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 27 \\ 29 \\ \hline \end{array}$ | $\begin{array}{r} 36 \\ 9 \end{array}$ | 57 | 54 | $\begin{aligned} & 36 \\ & 16 \\ & \hline \end{aligned}$ | $\begin{aligned} & \hline 28 \\ & 25 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline \mathbf{3 1} \\ 47 \\ \hline \end{array}$ | 50 |
| 51 |  | 40 | $\begin{aligned} & 47 \\ & 20 \\ & \hline \end{aligned}$ | $\begin{aligned} & \hline 12 \\ & 36 \\ & \hline \end{aligned}$ | $\begin{aligned} & 29 \\ & 11 \\ & \hline \end{aligned}$ |  | 0 | $\begin{aligned} & \mathbf{5 2} \\ & 19 \end{aligned}$ | $\begin{aligned} & 45 \\ & 33 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline \mathbf{3 1} \\ 50 \\ \hline \end{array}$ |  | 19 | $\begin{aligned} & 55 \\ & 18 \end{aligned}$ | $\begin{aligned} & 47 \\ & 31 \end{aligned}$ | $\begin{array}{r} 14 \\ \hline 8 \end{array}$ |  | 37 | $\begin{aligned} & 55 \\ & 17 \end{aligned}$ | $\begin{aligned} & 56 \\ & 28 \end{aligned}$ | $\begin{array}{r} 45 \\ 5 \end{array}$ |  | 54 | $\begin{aligned} & 52 \\ & 16 \end{aligned}$ | $\begin{array}{r} 54 \\ 24 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{1 8} \\ & 43 \end{aligned}$ | 51 |
| 52 |  | 41 | $\begin{array}{r} 7 \\ 20 \end{array}$ | $\begin{aligned} & 48 \\ & 35 \end{aligned}$ | $\begin{array}{r} 40 \\ 8 \end{array}$ |  | 1 | $\begin{aligned} & 12 \\ & 19 \end{aligned}$ | $\begin{aligned} & 19 \\ & 3^{2} \end{aligned}$ | $\begin{array}{\|l\|} \hline \mathbf{2 1} \\ 47 \\ \hline \end{array}$ |  | 20 | $\begin{aligned} & 14 \\ & 18 \end{aligned}$ | $\begin{aligned} & 18 \\ & 30 \end{aligned}$ | $\begin{array}{r} 22 \\ \hline \end{array}$ |  | 38 | $\begin{array}{\|l\|} \hline 13 \\ 17 \\ \hline \end{array}$ | $\begin{aligned} & 24 \\ & 27 \end{aligned}$ | $\begin{array}{r} 50 \\ 20 \end{array}$ |  | 55 | 9 16 | $\begin{aligned} & \hline 19 \\ & 23 \\ & \hline \end{aligned}$ | $\begin{array}{r} 1 \\ 40 \end{array}$ | 52 |
| 53 |  | 41 | $\begin{array}{\|l\|} \hline 28 \\ 20 \end{array}$ | $\begin{aligned} & 23 \\ & 34 \\ & \hline \end{aligned}$ | $\begin{array}{r} 48 \\ 6 \end{array}$ |  | 1 | $\begin{array}{\|l\|l} \mathbf{3 1} \\ 19 \end{array}$ | $\begin{aligned} & 5^{2} \\ & 3^{1} \\ & \hline \end{aligned}$ | $\begin{array}{r} 8 \\ 45 \end{array}$ |  | 20 | $\begin{aligned} & 32 \\ & 18 \end{aligned}$ | $\begin{aligned} & 48 \\ & 29 \\ & \hline \end{aligned}$ | $27$ |  | 38 | $\begin{aligned} & \mathbf{3 0} \\ & 17 \end{aligned}$ | $\begin{array}{\|l} \mathbf{5 1} \\ \mathbf{2 5} \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{5 2} \\ & 58 \\ & \hline \end{aligned}$ |  | 55 | $\begin{aligned} & 25 \\ & 16 \end{aligned}$ | $\begin{aligned} & 42 \\ & 22 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \mathbf{4 1} \\ \mathbf{3 7} \\ \hline \end{array}$ | 53 |
| 54 |  | 41 | $\begin{aligned} & 48 \\ & 20 \end{aligned}$ | $\begin{aligned} & \mathbf{5 7} \\ & 33 \\ & \hline \end{aligned}$ | $54$ |  | 1 | $\begin{aligned} & \mathbf{5 1} \\ & 19 \end{aligned}$ | $\begin{aligned} & 23 \\ & 30 \end{aligned}$ | $\begin{array}{\|l\|} \hline 53 \\ 42 \\ \hline \end{array}$ |  | 20 | $\begin{aligned} & 51 \\ & 18 \end{aligned}$ | $\begin{array}{\|l} \hline 17 \\ \mathbf{2 7} \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 28 \\ 59 \\ \hline \end{array}$ |  | $3^{8}$ | $\begin{aligned} & 48 \\ & 17 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 17 \\ 24 \\ \hline \end{array}$ | $\begin{aligned} & 50 \\ & 56 \end{aligned}$ |  | 55 | $\begin{aligned} & 42 \\ & 16 \end{aligned}$ | $\begin{array}{r} 5 \\ 21 \end{array}$ | $\begin{aligned} & \hline 18 \\ & 33 \\ & \hline \end{aligned}$ | 54 |
| 55 |  | 42 | $\begin{array}{r} 9 \\ 20 \end{array}$ | $\begin{aligned} & 30 \\ & 32 \\ & \hline \end{aligned}$ | $\begin{array}{r} 58 \\ 2 \end{array}$ |  | 2 | $\begin{aligned} & 10 \\ & 19 \end{aligned}$ | $\begin{aligned} & 54 \\ & 29 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 35 \\ 40 \\ \hline \end{array}$ |  | 21 | $\begin{array}{r} 9 \\ 18 \end{array}$ | $\begin{aligned} & 45 \\ & 26 \end{aligned}$ | $\begin{aligned} & \mathbf{2 7} \\ & 56 \end{aligned}$ |  | 39 | $\begin{array}{r} \mathbf{5} \\ \mathbf{1} 7 \\ \hline \end{array}$ | $\begin{aligned} & 42 \\ & 23 \\ & \hline \end{aligned}$ | $\begin{aligned} & 46 \\ & 52 \\ & \hline \end{aligned}$ |  | 55 | $\begin{aligned} & 58 \\ & 16 \end{aligned}$ | $\begin{aligned} & 26 \\ & 20 \end{aligned}$ | $\begin{array}{\|l} \hline 51 \\ 29 \\ \hline \end{array}$ | 55 |
| 56 |  | 42 | $\begin{aligned} & 30 \\ & 20 \\ & \hline \end{aligned}$ | $\begin{array}{r} 3 \\ 30 \\ \hline \end{array}$ | $\begin{array}{r} \mathbf{o} \\ 59 \\ \hline \end{array}$ |  | 2 | $\begin{aligned} & 30 \\ & 19 \end{aligned}$ | $\begin{aligned} & 24 \\ & 28 \end{aligned}$ | $\begin{array}{\|l\|} \hline 15 \\ 37 \\ \hline \end{array}$ |  | 21 | $\begin{aligned} & 28 \\ & 18 \end{aligned}$ | $\begin{array}{\|l} \hline 12 \\ 25 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 23 \\ 53 \\ \hline \end{array}$ |  | 39 | $\begin{array}{\|l} \hline 23 \\ 17 \\ \hline \end{array}$ | $\begin{array}{r} 6 \\ 22 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 38 \\ 49 \\ \hline \end{array}$ |  | 56 | $\begin{aligned} & \hline 14 \\ & 16 \end{aligned}$ | $\begin{aligned} & 47 \\ & 19 \\ & \hline \end{aligned}$ | $\begin{aligned} & 20 \\ & 26 \\ & \hline \end{aligned}$ | 56 |
| 57 |  | 42 | $\left[\begin{array}{l} 50 \\ 20 \end{array}\right.$ | $\begin{array}{\|l} 33 \\ 29 \\ \hline \end{array}$ | $\begin{array}{\|l} 59 \\ 57 \\ \hline \end{array}$ |  | 2 | $\begin{aligned} & 49 \\ & 19 \end{aligned}$ | $\begin{array}{\|l} \mathbf{5 2} \\ \mathbf{2} \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{5}^{2} \\ & 34 \\ & \hline \end{aligned}$ |  | 21 | $\begin{aligned} & 46 \\ & 18 \end{aligned}$ | $\begin{array}{\|l} \hline 38 \\ 24 \\ \hline \end{array}$ | $\begin{aligned} & 16 \\ & 51 \end{aligned}$ |  | 39 | $\begin{aligned} & \mathbf{4 0} \\ & \mathbf{1} 7 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} 29 \\ 21 \end{array}$ | $\begin{array}{\|l} 27 \\ 46 \\ \hline \end{array}$ |  | 56 | $\begin{aligned} & \mathbf{3 1} \\ & 16 \end{aligned}$ | $\begin{array}{r} 6 \\ 18 \end{array}$ | $\begin{aligned} & \hline 46 \\ & 22 \end{aligned}$ | 57 |
| 58 |  | 43 | $\left\lvert\, \begin{aligned} & 11 \\ & 20 \end{aligned}\right.$ | $\begin{array}{\|r\|} \hline 3 \\ 28 \end{array}$ | $\begin{aligned} & \mathbf{5 6} \\ & 55 \\ & \hline \end{aligned}$ |  | 3 | $\begin{array}{r} 9 \\ 19 \end{array}$ | $\begin{aligned} & 20 \\ & 26 \end{aligned}$ | $\begin{aligned} & 26 \\ & 32 \\ & \hline \end{aligned}$ |  | 22 | $\begin{array}{r} 5 \\ 18 \end{array}$ | $\begin{array}{r} 3 \\ 23 \\ \hline \end{array}$ | $\begin{array}{r} 7 \\ 47 \\ \hline \end{array}$ |  | 39 | $\begin{aligned} & 57 \\ & 17 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \mathbf{5 1} \\ \mathbf{2 0} \end{array}$ | $\begin{array}{\|l} \hline 13 \\ 42 \\ \hline \end{array}$ |  | 56 | $\begin{aligned} & 47 \\ & 16 \end{aligned}$ | $\begin{aligned} & \mathbf{2 5} \\ & \mathbf{1 7} \\ & \hline \end{aligned}$ | 8 19 | 58 |
| 59 |  | 43 | $\begin{array}{\|l\|} \hline 31 \\ 20 \end{array}$ | $\begin{array}{\|l\|} \hline \mathbf{3 2} \\ \mathbf{2} 7 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{5 1} \\ & 53 \end{aligned}$ |  | 3 | $\begin{aligned} & 28 \\ & 19 \end{aligned}$ | $\begin{aligned} & 4^{6} \\ & 25 \end{aligned}$ | $\begin{aligned} & \hline 58 \\ & 29 \\ & \hline \end{aligned}$ |  | 22 | $\begin{aligned} & 23 \\ & 18 \end{aligned}$ | $\begin{aligned} & 26 \\ & 22 \end{aligned}$ | $\begin{array}{\|} 54 \\ 44 \\ \hline \end{array}$ |  | 40 | $\begin{aligned} & 15 \\ & 17 \end{aligned}$ | $\begin{array}{\|l\|} \hline 11 \\ 19 \\ \hline \end{array}$ | $\begin{aligned} & 55 \\ & 40 \end{aligned}$ |  | 57 | $\begin{array}{r} 3 \\ 16 \end{array}$ | $\begin{aligned} & 42 \\ & 16 \end{aligned}$ | $\begin{aligned} & \mathbf{2 7} \\ & 16 \end{aligned}$ | 59 |
| 60 | 56 | 43 | $\left[\begin{array}{l} 52 \\ 20 \end{array}\right.$ | $\begin{array}{r} 0 \\ 26 \end{array}$ | $\begin{array}{\|l} 44 \\ 51 \\ \hline \end{array}$ | 57 | 3 | $\begin{aligned} & 48 \\ & 19 \end{aligned}$ | $\begin{aligned} & 12 \\ & 24 \\ & \hline \end{aligned}$ | $\begin{array}{\|} \mathbf{2 7} \\ 27 \\ \hline \end{array}$ | 57 | 22 | $\begin{aligned} & \mathbf{4 1} \\ & \mathbf{1 8} \end{aligned}$ | $\begin{aligned} & 49 \\ & 21 \end{aligned}$ | $\begin{aligned} & 38 \\ & 42 \end{aligned}$ | 57 | 40 | $\begin{aligned} & \mathbf{3 2}_{2} \\ & \mathbf{1 7} \\ & \hline \end{aligned}$ | $\left\lvert\, \begin{aligned} & \mathbf{3 1} \\ & \mathbf{1 8} \end{aligned}\right.$ | $\begin{aligned} & 35 \\ & 36 \\ & \hline \end{aligned}$ | 57 | 57 | $\begin{aligned} & 19 \\ & 16 \end{aligned}$ | $\begin{aligned} & 58 \\ & 15 \end{aligned}$ | $\begin{array}{\|l} 43 \\ 11 \end{array}$ | 60 |

Bürgi's 1' sine table (reconstruction, D. Roegel, 2016)

| 1 | $75^{\circ}$ |  |  |  |  | $76^{\circ}$ |  |  |  |  | $77^{\circ}$ |  |  |  |  | $78^{\circ}$ |  |  |  |  | $79^{\circ}$ |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 0 | 57 | 57 | $\begin{aligned} & 19 \\ & 16 \end{aligned}$ | $\begin{aligned} & 58 \\ & 15 \end{aligned}$ | $\begin{array}{\|l\|} \hline 43 \\ 11 \end{array}$ | 58 | 13 | $\begin{array}{r} 3 \\ 15 \end{array}$ | $\begin{aligned} & \hline 5^{2} \\ & 11 \end{aligned}$ | $\begin{array}{\|l} \hline 37 \\ 29 \\ \hline \end{array}$ | 58 | 27 | $\begin{array}{\|l\|} \hline 43 \\ 14 \\ \hline \end{array}$ | $\begin{array}{r} 56 \\ 7 \end{array}$ | $\begin{array}{r} 2 \\ 31 \\ \hline \end{array}$ | 58 | 41 | $\begin{aligned} & 19 \\ & 13 \end{aligned}$ | $\begin{array}{r} \mathbf{5 2} \\ 3 \end{array}$ | $\begin{array}{\|l\|} \hline 54 \\ \mathbf{1} 7 \\ \hline \end{array}$ | 58 | 53 | $\begin{aligned} & \mathbf{5 1} \\ & \mathbf{1 1} \end{aligned}$ | $\begin{aligned} & \mathbf{2 8} \\ & 58 \end{aligned}$ | $\begin{array}{\|l} \hline 18 \\ 48 \end{array}$ | 0 |
| 1 |  | 57 | $\begin{aligned} & 36 \\ & 16 \end{aligned}$ | $\begin{array}{\|l\|} \hline 13 \\ 14 \end{array}$ | $\begin{array}{r} 54 \\ 8 \end{array}$ |  | 13 | $\begin{aligned} & 19 \\ & 15 \end{aligned}$ | $\begin{array}{r} 4 \\ 10 \end{array}$ | $\begin{array}{r} 6 \\ 26 \end{array}$ |  | 27 | $\begin{aligned} & 58 \\ & 14 \\ & \hline \end{aligned}$ | $\begin{aligned} & 3 \\ & 6 \end{aligned}$ | $\begin{aligned} & 33 \\ & 27 \\ & \hline \end{aligned}$ |  | 41 | $\begin{aligned} & \mathbf{3 2} \\ & 13 \end{aligned}$ | $\begin{array}{r} 56 \\ 2 \end{array}$ | $\begin{aligned} & \hline 11 \\ & 12 \end{aligned}$ |  | 54 | $\begin{array}{r} 3 \\ 11 \end{array}$ | $\begin{array}{\|l} \hline 27 \\ 57 \\ \hline \end{array}$ | $\begin{array}{\|r} \hline 6 \\ 43 \\ \hline \end{array}$ | 1 |
| 2 |  | 57 | $\begin{aligned} & 52 \\ & 16 \end{aligned}$ | $\begin{aligned} & 28 \\ & 13 \end{aligned}$ | $\begin{aligned} & 2 \\ & 5 \\ & \hline \end{aligned}$ |  | 13 | $\begin{aligned} & 34 \\ & 15 \end{aligned}$ | $\begin{array}{r} 14 \\ \hline 9 \end{array}$ | $\begin{aligned} & 32 \\ & 22 \end{aligned}$ |  | 28 | $\begin{array}{\|l} 12 \\ 14 \\ \hline \end{array}$ | $\begin{array}{r} 10 \\ \hline \end{array}$ | $\begin{array}{r} 0 \\ \mathbf{2 2} \end{array}$ |  | 41 | $\begin{aligned} & 45 \\ & 13 \end{aligned}$ | $\begin{gathered} 58 \\ 1 \end{gathered}$ | $\begin{array}{r} 23 \\ \hline \\ \hline \end{array}$ |  | 54 | $\begin{aligned} & 15 \\ & 11 \end{aligned}$ | $\begin{aligned} & 24 \\ & 56 \\ & \hline \end{aligned}$ | $\begin{aligned} & 49 \\ & 38 \end{aligned}$ |  |
| 3 |  | 58 | $\begin{array}{r} 8 \\ 16 \end{array}$ | $\begin{aligned} & 41 \\ & 12 \end{aligned}$ | $\begin{aligned} & 7 \\ & 1 \end{aligned}$ |  | 13 | $\begin{aligned} & 49 \\ & 15 \\ & \hline \end{aligned}$ | $\begin{array}{r} 23 \\ 8 \end{array}$ | $\begin{aligned} & 54 \\ & 18 \end{aligned}$ |  | 28 | $\begin{array}{\|l\|} \hline 26 \\ 14 \\ \hline \end{array}$ | $\begin{array}{r} 15 \\ \hline \end{array}$ | $\begin{array}{\|l} 22 \\ 18 \end{array}$ |  | 41 | $\begin{aligned} & 58 \\ & 13 \end{aligned}$ | $\begin{array}{r} 59 \\ 0 \end{array}$ | $\begin{array}{r} 30 \\ 3 \\ \hline \end{array}$ |  | 54 | $\begin{aligned} & 27 \\ & 11 \end{aligned}$ | $\begin{array}{\|l\|} \mathbf{2 1} \\ 55 \\ \hline \end{array}$ | $\begin{array}{\|l} 27 \\ 34 \\ \hline \end{array}$ | 3 |
| 4 |  | 58 | $\begin{aligned} & 24 \\ & 16 \end{aligned}$ | $\begin{array}{\|l} 53 \\ 10 \end{array}$ | $\begin{array}{\|r} \hline 8 \\ 57 \\ \hline \end{array}$ |  | 14 | $\begin{array}{r} 4 \\ 15 \\ \hline \end{array}$ | $32$ | $\begin{array}{\|l\|} \hline 12 \\ 14 \\ \hline \end{array}$ |  | 28 | $\begin{aligned} & 40 \\ & 14 \\ & \hline \end{aligned}$ | $\begin{array}{r} 19 \\ 3 \end{array}$ | $\begin{aligned} & 40 \\ & 15 \end{aligned}$ |  | 42 | $\begin{aligned} & 11 \\ & 12 \end{aligned}$ | $\begin{array}{\|l} 59 \\ 58 \\ \hline \end{array}$ | $\begin{array}{r} 33 \\ 59 \\ \hline \end{array}$ |  | 54 | $\begin{aligned} & 39 \\ & 11 \end{aligned}$ | $\begin{array}{\|l} \mathbf{1 7} \\ 54 \\ \hline \end{array}$ | $\begin{array}{\|r} 1 \\ 29 \\ \hline \end{array}$ | 4 |
| 5 |  | 58 | $\begin{aligned} & \mathbf{4 1} \\ & \mathbf{1 6} \end{aligned}$ | $\begin{aligned} & 4 \\ & 9 \\ & \hline \end{aligned}$ | $\begin{array}{r} 5 \\ 54 \\ \hline \end{array}$ |  | 14 | $\begin{aligned} & 19 \\ & 15 \end{aligned}$ | $\begin{array}{r} 39 \\ \hline \end{array}$ | $\begin{aligned} & 26 \\ & 10 \end{aligned}$ |  | 28 | $\begin{array}{\|l} 54 \\ 14 \\ \hline \end{array}$ | $\begin{array}{r} 22 \\ 2 \end{array}$ | $\begin{array}{\|l} 55 \\ 10 \end{array}$ |  | 42 | $\begin{aligned} & 24 \\ & 12 \end{aligned}$ | $\begin{aligned} & 58 \\ & 57 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline \mathbf{3 2}^{2} \\ 55 \\ \hline \end{array}$ |  | 54 | $\begin{aligned} & 51 \\ & 11 \end{aligned}$ | $\begin{aligned} & \mathbf{1 1} \\ & 53 \end{aligned}$ | $\begin{array}{\|l} \hline 30 \\ 25 \\ \hline \end{array}$ | 5 |
| 6 |  | 58 | $\begin{aligned} & 57 \\ & 16 \end{aligned}$ | $\begin{array}{r} 13 \\ \hline 8 \end{array}$ | $\begin{array}{\|l\|} \hline 59 \\ 51 \\ \hline \end{array}$ |  | 14 | $\begin{aligned} & 34 \\ & 15 \end{aligned}$ | $\begin{array}{r} 45 \\ \hline \end{array}$ | $\begin{array}{r} 36 \\ 6 \end{array}$ |  | 29 | $\begin{array}{r} \hline 8 \\ 14 \\ \hline \end{array}$ | $\begin{array}{r} 25 \\ 1 \end{array}$ | $\begin{aligned} & 5 \\ & 6 \end{aligned}$ |  | 42 | $\begin{aligned} & 37 \\ & 12 \end{aligned}$ | $\begin{aligned} & 56 \\ & 56 \end{aligned}$ | $\begin{aligned} & 27 \\ & 50 \\ & \hline \end{aligned}$ |  | 55 | $\begin{array}{r} 3 \\ 11 \end{array}$ | $\begin{array}{r} 4 \\ 5^{2} \end{array}$ | $\begin{array}{\|l\|} \hline 55 \\ 20 \end{array}$ | 6 |
| 7 |  | 59 | $\begin{array}{l\|} \hline 13 \\ 16 \end{array}$ | $\begin{array}{\|r\|} \hline 22 \\ 7 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 50 \\ 46 \\ \hline \end{array}$ |  | 14 | $\begin{aligned} & 49 \\ & 15 \end{aligned}$ | $\begin{array}{r} 50 \\ \hline 4 \\ \hline \end{array}$ | $\begin{array}{r} 42 \\ 3 \\ \hline \end{array}$ |  | 29 | $\begin{array}{\|l} \hline 22 \\ 14 \\ \hline \end{array}$ | $\begin{array}{r} 26 \\ 0 \end{array}$ | $\begin{array}{r} 11 \\ 1 \end{array}$ |  | 42 | $\begin{aligned} & 50 \\ & 12 \end{aligned}$ | $\begin{array}{\|l} 53 \\ 55 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 17 \\ 46 \\ \hline \end{array}$ |  | 55 | $\begin{array}{l\|} \hline 14 \\ 11 \end{array}$ | $\begin{array}{\|l\|} \hline 57 \\ 51 \\ \hline \end{array}$ | $\begin{aligned} & 15 \\ & 16 \end{aligned}$ | 7 |
| 8 |  | 59 | $\begin{aligned} & 29 \\ & 16 \\ & \hline \end{aligned}$ | $\begin{array}{r} 30 \\ 6 \end{array}$ | $\begin{array}{\|l\|} \hline 36 \\ 43 \\ \hline \end{array}$ |  | 15 | $\begin{array}{r} 4 \\ 15 \\ \hline \end{array}$ | $\begin{array}{\|} 54 \\ 2 \end{array}$ | $\begin{array}{\|l} \hline 45 \\ 59 \\ \hline \end{array}$ |  | 29 | $\begin{aligned} & 36 \\ & 13 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline \mathbf{2 6} \\ 58 \\ \hline \end{array}$ | $\begin{array}{\|l\|l\|} \hline 12 \\ 58 \\ \hline \end{array}$ |  | 43 | $\begin{array}{\|r\|} \hline 3 \\ 12 \end{array}$ | $\begin{aligned} & 49 \\ & 54 \\ & \hline \end{aligned}$ | $\begin{array}{r} 3 \\ 41 \\ \hline \end{array}$ |  | 55 | $\begin{aligned} & \hline 26 \\ & 11 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 48 \\ 50 \\ \hline \end{array}$ | $\begin{aligned} & \hline 31 \\ & 10 \end{aligned}$ | 8 |
| 9 |  | 59 | $\begin{aligned} & 45 \\ & 16 \end{aligned}$ | $\begin{array}{\|r} 37 \\ 5 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 19 \\ 40 \\ \hline \end{array}$ |  | 15 | $\begin{array}{\|l\|} \hline 19 \\ 15 \\ \hline \end{array}$ | $\begin{array}{r} 57 \\ 1 \end{array}$ | $\begin{array}{\|l\|} \hline 44 \\ 54 \\ \hline \end{array}$ |  | 29 | $\begin{array}{\|l} \hline 50 \\ 13 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 25 \\ 57 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline \mathbf{1 0} \\ 53 \\ \hline \end{array}$ |  | 43 | $\begin{array}{l\|} \hline 16 \\ 12 \end{array}$ | $\begin{array}{\|l} \hline 43 \\ 53 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 44 \\ 37 \\ \hline \end{array}$ |  | 55 | $\begin{aligned} & \hline 38 \\ & 11 \end{aligned}$ | $\begin{array}{\|l} \hline 38 \\ 49 \\ \hline \end{array}$ | $\begin{array}{\|r} \hline \mathbf{4 1} \\ 7 \\ \hline \end{array}$ | 9 |
| 10 | 58 | 0 | $\begin{array}{r} 1 \\ 16 \end{array}$ | $\begin{array}{r} 42 \\ \hline 4 \\ \hline \end{array}$ | $\begin{aligned} & 59 \\ & 36 \end{aligned}$ | 58 | 15 | $\begin{aligned} & 34 \\ & 15 \\ & \hline \end{aligned}$ | $\begin{array}{r} 59 \\ 0 \end{array}$ | $\begin{array}{\|l} \hline 38 \\ 51 \\ \hline \end{array}$ | 58 | 30 | $\begin{array}{\|r} 4 \\ 13 \\ \hline \end{array}$ | $\begin{aligned} & 23 \\ & 56 \\ & \hline \end{aligned}$ | $\begin{array}{r} 3 \\ 50 \\ \hline \end{array}$ | 58 | 43 | $\begin{aligned} & 29 \\ & 12 \end{aligned}$ | $\begin{array}{l\|} \hline 37 \\ 52 \\ \hline \end{array}$ | $\begin{aligned} & 21 \\ & 32 \\ & \hline \end{aligned}$ | 58 | 55 | $\begin{aligned} & 50 \\ & 11 \end{aligned}$ | $\begin{aligned} & \mathbf{2 7} \\ & 48 \\ & \hline \end{aligned}$ | $48$ |  |
| 11 |  | 0 | $\begin{aligned} & 17 \\ & 16 \end{aligned}$ | $\begin{array}{\|r} 47 \\ 3 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 35 \\ 32 \\ \hline \end{array}$ |  | 15 | $\begin{aligned} & 50 \\ & 14 \end{aligned}$ | $\begin{array}{\|r} \hline \mathbf{0} \\ 59 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 29 \\ 47 \\ \hline \end{array}$ |  | 30 | $\begin{array}{\|l\|} \hline 18 \\ 13 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 19 \\ 55 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 53 \\ 45 \\ \hline \end{array}$ |  | 43 | $\begin{aligned} & 4^{2} \\ & 12 \end{aligned}$ | $\begin{array}{\|l\|} \hline 29 \\ 51 \\ \hline \end{array}$ | $\begin{array}{\|l\|} 53 \\ 29 \\ \hline \end{array}$ |  | 56 | $\begin{array}{r} 2 \\ 11 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 15 \\ 46 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 49 \\ 57 \\ \hline \end{array}$ |  |
| 12 |  | 0 | $\begin{aligned} & 33 \\ & 16 \end{aligned}$ | $\begin{array}{r} 51 \\ 21 \end{array}$ | $\begin{array}{r} \hline 7 \\ 29 \\ \hline \end{array}$ |  | 16 | $\begin{array}{r} 5 \\ 14 \end{array}$ | $\begin{array}{\|r} \hline \mathbf{0} \\ 58 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 16 \\ 43 \\ \hline \end{array}$ |  | 30 | $\begin{array}{\|l} \hline \mathbf{3 2}^{2} \\ 13 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 15 \\ 54 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 3^{8} \\ 4^{1} \\ \hline \end{array}$ |  | 43 | $\begin{aligned} & 55 \\ & 12 \end{aligned}$ | $\begin{array}{\|l\|} \hline 21 \\ 50 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 22 \\ 23 \\ \hline \end{array}$ |  | 56 | $\begin{array}{\|l\|} 14 \\ 11 \end{array}$ | $\begin{array}{\|r} \hline \mathbf{2} \\ 45 \\ \hline \end{array}$ | $\begin{aligned} & 46 \\ & 53 \\ & \hline \end{aligned}$ |  |
| 13 |  | 0 | $\begin{aligned} & 49 \\ & 16 \end{aligned}$ | $53$ | $\begin{array}{\|l} \hline 36 \\ 25 \\ \hline \end{array}$ |  | 16 | $\begin{array}{\|l} 19 \\ 14 \end{array}$ | $\begin{array}{\|l} 58 \\ 57 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 59 \\ 39 \\ \hline \end{array}$ |  | 30 | $\begin{aligned} & 46 \\ & 13 \end{aligned}$ | $\begin{array}{\|l} \hline \mathbf{1 0} \\ 53 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 19 \\ 37 \\ \hline \end{array}$ |  | 44 | $\begin{array}{r} 8 \\ 12 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline \mathbf{1 1} \\ 49 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 45 \\ 20 \\ \hline \end{array}$ |  | 56 | $\begin{aligned} & 25 \\ & 11 \end{aligned}$ | $\begin{array}{\|l} \hline 48 \\ 44 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 39 \\ 47 \\ \hline \end{array}$ |  |
| 14 |  | 1 | $\begin{array}{r} 5 \\ 16 \end{array}$ | $\begin{array}{r} 55 \\ 0 \end{array}$ | $\begin{array}{\|r} 1 \\ 21 \end{array}$ |  | 16 | $\begin{aligned} & 34 \\ & 14 \end{aligned}$ | $\begin{aligned} & 56 \\ & 5^{6} \\ & \hline \end{aligned}$ | $\begin{aligned} & \hline 38 \\ & 35 \\ & \hline \end{aligned}$ |  | 31 | $\begin{array}{r} \mathbf{0} \\ 13 \\ \hline \end{array}$ | $\begin{array}{r} 3 \\ 5^{2} \\ \hline \end{array}$ | $\begin{aligned} & 56 \\ & 32 \end{aligned}$ |  | 44 | $\begin{aligned} & 21 \\ & 12 \end{aligned}$ | $\begin{array}{r} 1 \\ 48 \\ \hline \end{array}$ | $\begin{array}{\|r} \hline 5 \\ 14 \\ \hline \end{array}$ |  | 56 | $\begin{aligned} & 37 \\ & 11 \end{aligned}$ | $\begin{array}{\|l} \hline 33 \\ 43 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline \mathbf{2 6} \\ 43 \\ \hline \end{array}$ |  |
| 15 |  | 1 | $\begin{array}{\|l} 21 \\ 15 \\ \hline \end{array}$ | $\begin{aligned} & 55 \\ & 59 \\ & \hline \end{aligned}$ | $\begin{aligned} & 22 \\ & 18 \end{aligned}$ |  | 16 | $\begin{array}{\|l} 49 \\ 14 \end{array}$ | $\begin{array}{\|l} 53 \\ 55 \\ \hline \end{array}$ | $\begin{array}{\|l} 13 \\ 3^{2} \\ \hline \end{array}$ |  | 31 | $\begin{array}{\|l} 13 \\ 13 \\ \hline \end{array}$ | $\begin{aligned} & 56 \\ & 51 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 28 \\ 29 \\ \hline \end{array}$ |  | 44 | $\begin{aligned} & 33 \\ & 12 \end{aligned}$ | $\begin{array}{\|l\|} \hline 49 \\ 47 \\ \hline \end{array}$ | $19$ |  | 56 | $\begin{array}{\|l} 49 \\ 11 \end{array}$ | $\begin{array}{\|l} 17 \\ 4^{2} \\ \hline \end{array}$ | $\begin{array}{\|r} \mathbf{9} \\ 39 \\ \hline \end{array}$ |  |
| 16 |  | 1 | $\begin{aligned} & 37 \\ & 15 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 54 \\ 58 \\ \hline \end{array}$ | $\begin{aligned} & 40 \\ & 14 \end{aligned}$ |  | 17 | $\begin{array}{r} 4 \\ 14 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 48 \\ 54 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 45 \\ 27 \\ \hline \end{array}$ |  | 31 | $\begin{aligned} & 27 \\ & 13 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 47 \\ 50 \\ \hline \end{array}$ | $\begin{array}{\|l} 57 \\ 24 \\ \hline \end{array}$ |  | 44 | $\begin{aligned} & 46 \\ & 12 \end{aligned}$ | $\begin{array}{\|l} \hline 3^{6} \\ 46 \\ \hline \end{array}$ | $\begin{array}{r} 30 \\ 6 \end{array}$ |  | 57 | $\begin{array}{r} \mathbf{0} \\ 11 \end{array}$ | $\begin{array}{\|l} \hline 59 \\ 41 \\ \hline \end{array}$ | $\begin{array}{\|l} 48 \\ 33 \\ \hline \end{array}$ |  |
| 17 |  | 1 | $\begin{aligned} & 53 \\ & 15 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 52 \\ 57 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 54 \\ 11 \end{array}$ |  | 17 | $\begin{aligned} & 19 \\ & 14 \end{aligned}$ | $\begin{array}{\|l} \hline 43 \\ 53 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 12 \\ 24 \\ \hline \end{array}$ |  | 31 | $\begin{array}{\|l\|} \hline 41 \\ 13 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 38 \\ 49 \\ \hline \end{array}$ | $\begin{aligned} & 21 \\ & 20 \end{aligned}$ |  | 44 | $\begin{aligned} & 59 \\ & 12 \end{aligned}$ | $\begin{array}{\|l} 22 \\ 45 \\ \hline \end{array}$ | $\begin{array}{r} 36 \\ 2 \end{array}$ |  | 57 | $\begin{aligned} & 12 \\ & 11 \end{aligned}$ | $\begin{array}{\|l} \hline \mathbf{4 1} \\ 40 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 21 \\ 30 \\ \hline \end{array}$ |  |
| 18 |  | 2 | $\begin{array}{r} 9 \\ 15 \\ \hline \end{array}$ | $\begin{aligned} & 50 \\ & 56 \end{aligned}$ | $\begin{aligned} & 5 \\ & 6 \end{aligned}$ |  | 17 | $\begin{array}{\|l} 34 \\ 14 \\ \hline \end{array}$ | $\begin{aligned} & 36 \\ & 52 \end{aligned}$ | $\begin{aligned} & 36 \\ & 19 \\ & \hline \end{aligned}$ |  | 31 | $\begin{aligned} & 55 \\ & 13 \end{aligned}$ | $\begin{array}{\|l} 27 \\ 48 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{4 1} \\ & 16 \end{aligned}$ |  | 45 | $\begin{array}{\|l\|} 12 \\ 12 \end{array}$ | $\begin{array}{r} 7 \\ 43 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 38 \\ 57 \\ \hline \end{array}$ |  | 57 | $\begin{aligned} & 24 \\ & 11 \end{aligned}$ | $\begin{array}{\|l} \mathbf{2 1} \\ 39 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \mathbf{5 1} \\ \mathbf{2 4} \\ \hline \end{array}$ |  |
| 19 |  | 2 | $\begin{aligned} & 25 \\ & 15 \end{aligned}$ | $\begin{gathered} 46 \\ 55 \\ \hline \end{gathered}$ | $\begin{array}{\|r} \hline 11 \\ \hline \end{array}$ |  | 17 | $\begin{aligned} & 49 \\ & 14 \end{aligned}$ | $\begin{aligned} & 28 \\ & 51 \\ & \hline \end{aligned}$ | $\begin{aligned} & 55 \\ & 16 \end{aligned}$ |  | 32 | $\begin{array}{r} 9 \\ 13 \end{array}$ | $\begin{aligned} & 15 \\ & 47 \end{aligned}$ | $\begin{aligned} & \mathbf{5 7} \\ & 12 \end{aligned}$ |  | 45 | $\begin{aligned} & 24 \\ & 12 \end{aligned}$ | $\begin{aligned} & \hline 51 \\ & 42 \\ & \hline \end{aligned}$ | $\begin{aligned} & 35 \\ & 52 \\ & \hline \end{aligned}$ |  | 57 | $\begin{aligned} & 36 \\ & 11 \end{aligned}$ | $\begin{array}{r} \mathbf{1} \\ 3^{8} \\ \hline \end{array}$ | $\begin{aligned} & 15 \\ & 20 \end{aligned}$ |  |
| 20 | 58 | 2 | $\begin{aligned} & \mathbf{4 1} \\ & 15 \end{aligned}$ | $\begin{array}{\|l} \mathbf{4 1} \\ 53 \end{array}$ | $\begin{array}{\|l\|} \hline 15 \\ 59 \\ \hline \end{array}$ | 58 | 18 | $\begin{array}{r} 4 \\ 14 \\ \hline \end{array}$ | $\begin{aligned} & 20 \\ & 50 \\ & \hline \end{aligned}$ | $\begin{aligned} & 11 \\ & 12 \end{aligned}$ | 58 | 32 | $\begin{array}{\|l\|} \hline 23 \\ 13 \end{array}$ | $\begin{array}{\|r} 3 \\ 4^{6} \\ \hline \end{array}$ | $\begin{aligned} & 9 \\ & 8 \end{aligned}$ | 58 | 45 | $\begin{aligned} & 37 \\ & 17 \end{aligned}$ | $\begin{array}{\|l\|} 34 \\ 41 \\ \hline \end{array}$ | $\begin{array}{r} 27 \\ 49 \\ \hline \end{array}$ | 58 | 57 | $\begin{aligned} & 47 \\ & 11 \end{aligned}$ | $\begin{array}{\|l} 39 \\ 37 \\ \hline \end{array}$ | $\begin{array}{\|l} 35 \\ 15 \end{array}$ |  |
| 21 |  | 2 | $\begin{array}{\|l} 57 \\ 15 \\ \hline \end{array}$ | $\begin{aligned} & 35 \\ & 52 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} 14 \\ 56 \\ \hline \end{array}$ |  | 18 | $\begin{array}{\|l} 19 \\ 14 \end{array}$ | $\begin{array}{\|l} \mathbf{1 0} \\ 49 \\ \hline \end{array}$ | $\begin{array}{r} 23 \\ 7 \\ \hline \end{array}$ |  | 32 | $\begin{aligned} & \hline 36 \\ & 13 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 49 \\ 45 \end{array}$ | $\begin{array}{r} \mathbf{1 7} \\ 3 \end{array}$ |  | 45 | $\begin{array}{\|l} 50 \\ 12 \end{array}$ | $\begin{aligned} & 16 \\ & 40 \end{aligned}$ | $\begin{array}{r} \hline 16 \\ 44 \\ \hline \end{array}$ |  | 57 | $\begin{array}{\|l} 59 \\ 11 \end{array}$ | $\begin{aligned} & 16 \\ & 36 \end{aligned}$ | $\begin{aligned} & 50 \\ & 11 \end{aligned}$ |  |
| 22 |  | 3 | $\begin{array}{\|l} 13 \\ 15 \\ \hline \end{array}$ | $\begin{aligned} & 28 \\ & 51 \\ & \hline \end{aligned}$ | $\begin{aligned} & 10 \\ & 52 \end{aligned}$ |  | 18 | $\begin{array}{\|l} 33 \\ 14 \end{array}$ | $\begin{array}{\|} 59 \\ 48 \\ \hline \end{array}$ | $\begin{array}{r} 30 \\ 4 \\ \hline \end{array}$ |  | 32 | $\begin{aligned} & 50 \\ & 13 \end{aligned}$ | $\begin{array}{\|l} \mathbf{3 4} \\ 43 \end{array}$ | $\begin{array}{\|l} 20 \\ 59 \\ \hline \end{array}$ |  | 46 | $\begin{array}{r} 2 \\ 12 \end{array}$ | $\begin{aligned} & 57 \\ & 39 \end{aligned}$ | $\begin{array}{r} \mathbf{o} \\ 39 \end{array}$ |  | 58 | $\begin{aligned} & 10 \\ & 11 \end{aligned}$ | $\begin{aligned} & 53 \\ & 35 \\ & \hline \end{aligned}$ | $\begin{aligned} & \mathbf{1} \\ & 5 \\ & \hline \end{aligned}$ |  |
| 23 |  | 3 | $\begin{aligned} & 29 \\ & 15 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 20 \\ 50 \\ \hline \end{array}$ | $\begin{array}{r} 2 \\ 49 \\ \hline \end{array}$ |  | 18 | $\begin{aligned} & 48 \\ & 14 \end{aligned}$ | $\begin{array}{\|l} 47 \\ 47 \\ \hline \end{array}$ | $\begin{array}{r} 34 \\ 0 \end{array}$ |  | 33 | $\begin{array}{\|r} 4 \\ 13 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 18 \\ 42 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 19 \\ 55 \\ \hline \end{array}$ |  | 46 | $\begin{aligned} & 15 \\ & 12 \end{aligned}$ | $\begin{aligned} & 36 \\ & 38 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 39 \\ 35 \\ \hline \end{array}$ |  | 58 | $\begin{array}{\|l} 22 \\ 11 \end{array}$ | $\begin{aligned} & \hline 28 \\ & 34 \\ & \hline \end{aligned}$ | 6 1 |  |
| 24 |  | 3 | $\begin{aligned} & 45 \\ & 15 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 10 \\ 49 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline \mathbf{5 1} \\ \mathbf{4 5} \\ \hline \end{array}$ |  | 19 | $\begin{array}{r} 3 \\ 14 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 34 \\ 45 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 34 \\ 56 \\ \hline \end{array}$ |  | 33 | $\begin{array}{\|l\|} \hline 18 \\ 13 \\ \hline \end{array}$ | $\begin{array}{\|r} 1 \\ 4^{1} \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline \mathbf{1 4} \\ 51 \\ \hline \end{array}$ |  | 46 | $\begin{aligned} & 28 \\ & 12 \end{aligned}$ | $\begin{array}{\|l} \hline 15 \\ 37 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 14 \\ 31 \\ \hline \end{array}$ |  | 58 | $\begin{aligned} & 34 \\ & 11 \end{aligned}$ | $\begin{array}{r} 2 \\ 32 \\ \hline \end{array}$ | $\begin{array}{\|r} \hline 7 \\ 57 \\ \hline \end{array}$ |  |
| 25 |  | 4 | $\begin{array}{\|r} \hline \mathbf{1} \\ \mathbf{1 5} \\ \hline \end{array}$ | $\begin{array}{\|r} \hline \mathbf{o} \\ 48 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 36 \\ 41 \\ \hline \end{array}$ |  | 19 | $\begin{aligned} & 18 \\ & 14 \end{aligned}$ | $44$ | $\begin{aligned} & 30 \\ & 52 \\ & \hline \end{aligned}$ |  | 33 | $\begin{array}{\|l\|l\|} \hline 31 \\ 13 \\ \hline \end{array}$ | $\begin{aligned} & 43 \\ & 40 \\ & \hline \end{aligned}$ | $\begin{array}{r} 5 \\ 4^{6} \\ \hline \end{array}$ |  | 46 | $\begin{aligned} & 40 \\ & 12 \end{aligned}$ | $\begin{aligned} & \hline \mathbf{5 2} \\ & 3^{6} \\ & \hline \end{aligned}$ | $\begin{aligned} & 45 \\ & 26 \\ & \hline \end{aligned}$ |  | 58 | $\begin{aligned} & 45 \\ & 11 \end{aligned}$ | $\begin{array}{\|l\|} \hline 35 \\ 31 \\ \hline \end{array}$ | $\begin{array}{\|r} 4 \\ 5^{2} \\ \hline \end{array}$ | 5 |
| 26 |  | 4 | $\begin{array}{\|l\|} \hline 16 \\ 15 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 49 \\ 47 \\ \hline \end{array}$ | $\begin{aligned} & 17 \\ & 38 \\ & \hline \end{aligned}$ |  | 19 | $\begin{array}{\|l} 33 \\ 14 \\ \hline \end{array}$ | $\begin{array}{r} 5 \\ 43 \\ \hline \end{array}$ | $\begin{aligned} & 22 \\ & 48 \\ & \hline \end{aligned}$ |  | 33 | $\begin{aligned} & 45 \\ & 13 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \mathbf{2 3} \\ 39 \\ \hline \end{array}$ | $\begin{array}{\|l} \mathbf{5 1} \\ 43 \\ \hline \end{array}$ |  | 46 | $\begin{array}{\|l} 53 \\ 12 \end{array}$ | $\begin{aligned} & 29 \\ & 35 \\ & \hline \end{aligned}$ | $\begin{aligned} & \hline 11 \\ & 21 \end{aligned}$ |  | 58 | $\begin{array}{\|l} 57 \\ 11 \end{array}$ | $\begin{array}{\|r} 6 \\ 30 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 56 \\ 47 \\ \hline \end{array}$ |  |
| 27 |  | 4 | $\begin{aligned} & \hline 32 \\ & 15 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 36 \\ 4^{6} \\ \hline \end{array}$ | $\begin{aligned} & 55 \\ & 34 \\ & \hline \end{aligned}$ |  | 19 | $\begin{array}{\|l} 47 \\ 14 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 49 \\ 42 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 10 \\ 44 \\ \hline \end{array}$ |  | 33 | $\begin{aligned} & 59 \\ & 13 \\ & \hline \end{aligned}$ | $\begin{array}{\|r} 3 \\ 3^{8} \\ \hline \end{array}$ | $\begin{array}{\|l} \mathbf{3 4} \\ 38 \\ \hline \end{array}$ |  | 47 | $\begin{array}{r} 6 \\ 12 \end{array}$ | $\begin{array}{r} 4 \\ 34 \\ \hline \end{array}$ | $\begin{aligned} & 32 \\ & 17 \\ & \hline \end{aligned}$ |  | 59 | $\begin{array}{r} 8 \\ 11 \\ \hline \end{array}$ | $\begin{array}{\|l} 37 \\ 29 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 43 \\ 42 \\ \hline \end{array}$ | 7 |
| 28 |  | 4 | $\begin{aligned} & 48 \\ & 15 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 23 \\ 45 \\ \hline \end{array}$ | $\begin{aligned} & 29 \\ & 30 \\ & \hline \end{aligned}$ |  | 20 | $\begin{array}{r} 2 \\ 14 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 3^{1} \\ 41 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 54 \\ 40 \\ \hline \end{array}$ |  | 34 | $\begin{array}{\|l\|} \hline 12 \\ 13 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{4}^{2} \end{aligned}$ | $\begin{array}{\|l} \hline 12 \\ 34 \\ \hline \end{array}$ |  | 47 | $\begin{aligned} & \hline 18 \\ & 12 \end{aligned}$ | $\begin{array}{\|l\|} \hline 3^{8} \\ 33 \\ \hline \end{array}$ | $\begin{array}{\|l} 49 \\ 13 \\ \hline \end{array}$ |  | 59 | $\begin{aligned} & 20 \\ & 11 \end{aligned}$ | $\begin{array}{r} 7 \\ 28 \end{array}$ | $\begin{array}{\|l} \hline 25 \\ 38 \\ \hline \end{array}$ | 8 |
| 29 |  | 5 | $\begin{array}{r} 4 \\ 15 \\ \hline \end{array}$ | $\begin{array}{\|r\|} \hline 8 \\ 44 \\ \hline \end{array}$ | $\begin{aligned} & 59 \\ & 26 \end{aligned}$ |  | 20 | $\begin{array}{\|l\|} 17 \\ 14 \end{array}$ | $\begin{array}{\|l} 13 \\ 40 \\ \hline \end{array}$ | $\begin{aligned} & 34 \\ & 36 \\ & \hline \end{aligned}$ |  | 34 | $\begin{aligned} & \mathbf{2 6} \\ & 13 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 19 \\ 36 \\ \hline \end{array}$ | $\begin{aligned} & 46 \\ & 29 \end{aligned}$ |  | 47 | $\begin{aligned} & 31 \\ & 12 \end{aligned}$ | $\begin{aligned} & 12 \\ & 3^{2} \\ & \hline \end{aligned}$ | $\begin{aligned} & 2 \\ & 8 \end{aligned}$ |  | 59 | $\begin{aligned} & 31 \\ & 11 \end{aligned}$ | $\begin{aligned} & 36 \\ & 27 \end{aligned}$ | $\begin{array}{r} 3 \\ 33 \\ \hline \end{array}$ |  |
| 30 | 58 | 5 | $\begin{aligned} & 19 \\ & 15 \end{aligned}$ | $\begin{aligned} & 53 \\ & 43 \end{aligned}$ | $\begin{aligned} & 25 \\ & 23 \end{aligned}$ | 58 | 20 | $\left\lvert\, \begin{aligned} & \mathbf{3 1} \\ & \mathbf{1 4} \end{aligned}\right.$ | $\begin{array}{\|} 54 \\ 39 \\ \hline \end{array}$ | $\begin{aligned} & 10 \\ & 32 \end{aligned}$ | 58 | 34 | $\begin{aligned} & 39 \\ & 13 \\ & \hline \end{aligned}$ | $\begin{aligned} & 56 \\ & 35 \end{aligned}$ | $\begin{aligned} & 15 \\ & 26 \end{aligned}$ | 58 | 47 | $\begin{aligned} & 43 \\ & 12 \end{aligned}$ | $\begin{array}{\|l\|} \hline 44 \\ 31 \end{array}$ | $\begin{array}{r} 10 \\ 4 \\ \hline \end{array}$ | 58 | 59 | $\begin{aligned} & 43 \\ & 11 \end{aligned}$ | $\begin{array}{r} 3 \\ 26 \\ \hline \end{array}$ | $\begin{aligned} & 36 \\ & 28 \end{aligned}$ |  |

Bürgi's 1' sine table (reconstruction, D. Roegel, 2016)

| , | $75^{\circ}$ |  |  |  |  | $76^{\circ}$ |  |  |  |  | $77^{\circ}$ |  |  |  |  | $78^{\circ}$ |  |  |  |  | $79^{\circ}$ |  |  |  |  | , |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 30 | 58 | 5 | $\begin{array}{\|l\|} 19 \\ 15 \end{array}$ | $\begin{aligned} & 53 \\ & 43 \end{aligned}$ | $\begin{array}{l\|} \hline 25 \\ 23 \end{array}$ | 58 | 20 | $\begin{aligned} & \mathbf{3 1} \\ & 14 \end{aligned}$ | $\begin{array}{\|l} 54 \\ 39 \end{array}$ | $\begin{aligned} & 10 \\ & 32 \\ & \hline \end{aligned}$ | 58 | 34 | $\begin{array}{\|l} 39 \\ 13 \end{array}$ | $\begin{aligned} & 56 \\ & 35 \end{aligned}$ | $\begin{aligned} & 15 \\ & 26 \end{aligned}$ | 58 | 47 | $\begin{aligned} & 43 \\ & 12 \end{aligned}$ | $\begin{aligned} & 44 \\ & 31 \\ & \hline \end{aligned}$ | $\begin{array}{r} 10 \\ 4 \\ \hline \end{array}$ | 58 | 59 | $\begin{aligned} & 43 \\ & 11 \end{aligned}$ | $\begin{array}{\|r\|} \hline 3 \\ 26 \end{array}$ | $\begin{array}{\|l\|} \hline 36 \\ 28 \end{array}$ | 30 |
| 31 |  | 5 | $\begin{array}{\|l} \hline 35 \\ 15 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 36 \\ 42 \\ \hline \end{array}$ | $\begin{aligned} & 48 \\ & 19 \\ & \hline \end{aligned}$ |  | 20 | $\begin{aligned} & 4^{6} \\ & 14 \end{aligned}$ | $\begin{aligned} & 33 \\ & 38 \\ & \hline \end{aligned}$ | $\begin{aligned} & 42 \\ & 28 \end{aligned}$ |  | 34 | $\begin{array}{\|l} 53 \\ 13 \\ \hline \end{array}$ | $\begin{array}{\|l} \mathbf{3 1} \\ 34 \\ \hline \end{array}$ | $\begin{array}{\|l} \mathbf{4 1} \\ 21 \end{array}$ |  | 47 | 56 <br> 12 | $\begin{aligned} & 15 \\ & 29 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \mathbf{1 4} \\ 59 \\ \hline \end{array}$ |  | 59 | $\begin{aligned} & 54 \\ & 11 \end{aligned}$ | $\begin{aligned} & 30 \\ & 25 \\ & \hline \end{aligned}$ | $\begin{array}{r}4 \\ 24 \\ \hline\end{array}$ | 31 |
| 32 |  | 5 | $\begin{aligned} & \mathbf{5 1} \\ & 15 \end{aligned}$ | $\begin{aligned} & \hline 19 \\ & 41 \\ & \hline \end{aligned}$ | $\begin{array}{r\|} \hline 7 \\ 15 \end{array}$ |  | 21 | $\begin{array}{r} 1 \\ 14 \end{array}$ | $\begin{aligned} & 12 \\ & 37 \end{aligned}$ | $\begin{aligned} & 10 \\ & 24 \end{aligned}$ |  | 35 | $\begin{array}{r} 7 \\ 13 \\ \hline \end{array}$ | $\begin{array}{\|r\|} \hline 6 \\ 33 \\ \hline \end{array}$ | $\begin{array}{\|r} 2 \\ 17 \\ \hline \end{array}$ |  | 48 | $\begin{array}{r} 8 \\ 12 \end{array}$ | $\begin{aligned} & 45 \\ & 28 \end{aligned}$ | $\begin{aligned} & 13 \\ & 55 \end{aligned}$ | 59 | 0 | $\begin{array}{r} 5 \\ 11 \end{array}$ | $\begin{aligned} & 55 \\ & 24 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 28 \\ 19 \\ \hline \end{array}$ | 32 |
| 33 |  | 6 | $\begin{array}{r} 7 \\ 15 \\ \hline \end{array}$ | $\begin{array}{r} 0 \\ 40 \\ \hline \end{array}$ | $\begin{aligned} & 22 \\ & 12 \end{aligned}$ |  | 21 | $\begin{array}{\|l} 15 \\ 14 \end{array}$ | $\begin{aligned} & 49 \\ & 36 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} 34 \\ 21 \end{array}$ |  | 35 | $\begin{array}{\|l} 20 \\ 13 \\ \hline \end{array}$ | $\begin{aligned} & 39 \\ & 3^{2} \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 19 \\ 12 \end{array}$ |  | 48 | $\begin{aligned} & 21 \\ & 12 \end{aligned}$ | $\begin{aligned} & 14 \\ & 27 \\ & \hline \end{aligned}$ | $\begin{array}{r} 8 \\ 50 \end{array}$ |  | 0 | $\begin{aligned} & 17 \\ & 11 \end{aligned}$ | $\begin{aligned} & 19 \\ & 23 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 47 \\ 14 \\ \hline \end{array}$ | 33 |
| 34 |  | 6 | $\begin{aligned} & 22 \\ & 15 \\ & \hline \end{aligned}$ | $\begin{aligned} & 40 \\ & 39 \end{aligned}$ | $\left.\begin{array}{r} 34 \\ 8 \end{array} \right\rvert\,$ |  | 21 | $\begin{array}{\|l} 30 \\ 14 \end{array}$ | $\begin{aligned} & 25 \\ & 35 \end{aligned}$ | $\begin{aligned} & 55 \\ & 16 \end{aligned}$ |  | 35 | $\begin{array}{\|l} 34 \\ 13 \\ \hline \end{array}$ | $\begin{aligned} & 11 \\ & 3^{1} \\ & \hline \end{aligned}$ | $\begin{array}{\|r} \mathbf{3 1} \\ 9 \\ \hline \end{array}$ |  | 48 | $33$ | $\begin{aligned} & 41 \\ & 26 \end{aligned}$ | $\begin{aligned} & 58 \\ & 46 \end{aligned}$ |  | 0 | $\begin{aligned} & 28 \\ & 11 \end{aligned}$ | $\begin{array}{\|l\|} \hline 43 \\ 22 \end{array}$ | $\begin{array}{r} 1 \\ 10 \end{array}$ | 34 |
| 35 |  | 6 | $\begin{array}{\|l\|} \hline 38 \\ 15 \\ \hline \end{array}$ | $\begin{aligned} & 19 \\ & 38 \\ & \hline \end{aligned}$ | $\begin{array}{r} 42 \\ 4 \end{array}$ |  | 21 | $\begin{aligned} & 45 \\ & 14 \end{aligned}$ | $\begin{array}{r} \mathbf{1} \\ 34 \\ \hline \end{array}$ | $\begin{aligned} & 11 \\ & 12 \end{aligned}$ |  | 35 | $\begin{array}{\|l} 47 \\ 13 \end{array}$ | $\begin{aligned} & \mathbf{4 2}^{2} \\ & 30 \end{aligned}$ | $\begin{array}{r} 40 \\ 4 \\ \hline \end{array}$ |  | 48 | $\begin{aligned} & 46 \\ & 12 \\ & \hline \end{aligned}$ | $\begin{array}{r} 8 \\ 25 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 44 \\ 41 \\ \hline \end{array}$ |  | 0 | $\begin{aligned} & \hline \mathbf{4 0} \\ & 11 \end{aligned}$ | $\begin{array}{r} \hline 5 \\ \hline 21 \end{array}$ | $\begin{array}{r} 11 \\ 5 \end{array}$ | 35 |
| 36 |  | 6 | $\begin{array}{\|l\|} \hline 53 \\ 15 \end{array}$ | $\begin{array}{\|l} 57 \\ 37 \\ \hline \end{array}$ | $\begin{array}{\|r\|} \hline 46 \\ 1 \end{array}$ |  | 21 | $\begin{array}{\|l\|} \hline 59 \\ 14 \end{array}$ | $\begin{aligned} & 35 \\ & 33 \end{aligned}$ | $\begin{array}{r} 23 \\ 8 \end{array}$ |  | 36 | $\begin{array}{r} 1 \\ 13 \\ \hline \end{array}$ | $\begin{array}{\|l} 12 \\ 28 \end{array}$ | $\begin{aligned} & 44 \\ & 59 \\ & \hline \end{aligned}$ |  | 48 | $\begin{aligned} & 58 \\ & 12 \end{aligned}$ | $\begin{array}{\|l} 34 \\ 24 \\ \hline \end{array}$ | $\begin{aligned} & 25 \\ & 37 \\ & \hline \end{aligned}$ |  | 0 | $\begin{array}{\|l} 51 \\ 11 \end{array}$ | $\begin{aligned} & 26 \\ & 20 \end{aligned}$ | $\begin{array}{r} 16 \\ 0 \end{array}$ | 36 |
| 37 |  | 7 | $\begin{array}{r} 9 \\ 15 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{3 4} \\ & 35 \\ & \hline \end{aligned}$ | $\begin{aligned} & 47 \\ & 56 \end{aligned}$ |  | 22 | $\begin{array}{\|l\|} \hline 14 \\ 14 \end{array}$ | $\begin{array}{r} 8 \\ 3^{2} \\ \hline \end{array}$ | $31$ |  | $3^{6}$ | $\begin{array}{\|l} 14 \\ 13 \\ \hline \end{array}$ | $\begin{array}{\|l} \mathbf{4 1} \\ \mathbf{2 7} \end{array}$ | $\begin{aligned} & 43 \\ & 56 \end{aligned}$ |  | 49 | $\begin{aligned} & 10 \\ & 12 \end{aligned}$ | $\begin{aligned} & 59 \\ & 23 \end{aligned}$ | $\begin{array}{r} 2 \\ 3^{2} \\ \hline \end{array}$ |  | 1 | $\begin{array}{r} 2 \\ \mathbf{1 1} \end{array}$ | $\begin{aligned} & 46 \\ & 18 \end{aligned}$ | $\begin{aligned} & \mathbf{1 6} \\ & 55 \end{aligned}$ | 37 |
| $3^{8}$ |  | 7 | $\begin{array}{\|} 25 \\ 15 \\ \hline \end{array}$ | $\begin{array}{\|l\|l} \mathbf{1 0} \\ 34 \\ \hline \end{array}$ | $\begin{aligned} & 43 \\ & 53 \end{aligned}$ |  | 22 | $\begin{aligned} & 28 \\ & 14 \end{aligned}$ | $\begin{aligned} & 40 \\ & 3^{1} \end{aligned}$ | $\begin{array}{r} 35 \\ 0 \end{array}$ |  | $3^{6}$ | $\begin{aligned} & 28 \\ & 13 \\ & \hline \end{aligned}$ | $\begin{array}{r} 9 \\ 26 \end{array}$ | $\begin{array}{\|l} 39 \\ 51 \\ \hline \end{array}$ |  | 49 | $23$ | $\begin{aligned} & 22 \\ & 22 \end{aligned}$ | $\begin{aligned} & 34 \\ & 28 \end{aligned}$ |  | 1 | $\begin{array}{l\|} \hline 14 \\ 11 \end{array}$ | $\begin{array}{\|r} 5 \\ 17 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 11 \\ 51 \\ \hline \end{array}$ | $3^{8}$ |
| 39 |  | 7 | $\begin{array}{\|l\|} \hline \mathbf{4 0} \\ 15 \\ \hline \end{array}$ | $\begin{aligned} & 45 \\ & 33 \\ & \hline \end{aligned}$ | $\begin{aligned} & 36 \\ & 50 \end{aligned}$ |  | 22 | $\begin{array}{\|l} 43 \\ 14 \\ \hline \end{array}$ | $\begin{array}{\|l} 11 \\ 29 \\ \hline \end{array}$ | $\begin{aligned} & 35 \\ & 56 \end{aligned}$ |  | $3^{6}$ | $\begin{array}{\|l} \mathbf{4 1} \\ \mathbf{1} \end{array}$ | $\begin{aligned} & 36 \\ & 25 \end{aligned}$ | $\begin{array}{\|l} 30 \\ 47 \\ \hline \end{array}$ |  | 49 | $\begin{aligned} & 35 \\ & 12 \end{aligned}$ | $\begin{array}{\|l} 45 \\ 21 \end{array}$ | $\begin{array}{r} 2 \\ 23 \\ \hline \end{array}$ |  | 1 | $\begin{aligned} & 25 \\ & 11 \end{aligned}$ | $\begin{array}{\|l} 23 \\ 16 \end{array}$ | $\begin{array}{r} 2 \\ 46 \end{array}$ | 39 |
| 40 | 58 | 7 | $\begin{array}{\|l\|} \hline 56 \\ 15 \\ \hline \end{array}$ | $\begin{aligned} & 19 \\ & 32 \\ & \hline \end{aligned}$ | $\begin{aligned} & \hline 26 \\ & 45 \\ & \hline \end{aligned}$ | $5^{8}$ | 22 | $\begin{array}{\|l} 57 \\ 14 \end{array}$ | $\begin{aligned} & \mathbf{4 1} \\ & \mathbf{2 8} \end{aligned}$ | $\begin{aligned} & \mathbf{3 1}^{1} \\ & 5^{2} \end{aligned}$ | 58 | 36 | $\begin{array}{\|l} 55 \\ 13 \\ \hline \end{array}$ | $\begin{array}{r} 2 \\ 24 \\ \hline \end{array}$ | $\begin{array}{r} 17 \\ 43 \\ \hline \end{array}$ | 58 | 49 | $\begin{aligned} & 48 \\ & 12 \\ & \hline \end{aligned}$ | $\begin{array}{\|r\|} \hline 6 \\ 20 \\ \hline \end{array}$ | $\begin{array}{\|l} 25 \\ 19 \\ \hline \end{array}$ | 59 | 1 | $\begin{aligned} & 36 \\ & 11 \end{aligned}$ | $\begin{array}{\|l\|} \hline 39 \\ 15 \\ \hline \end{array}$ | $\begin{aligned} & 4^{8} \\ & 41 \\ & \hline \end{aligned}$ | 40 |
| 41 |  | 8 | $\begin{array}{\|l\|} \hline \mathbf{1 1} \\ \mathbf{1 5} \\ \hline \end{array}$ | $\begin{aligned} & 52 \\ & 31 \\ & \hline \end{aligned}$ | $\begin{aligned} & 11 \\ & 42 \end{aligned}$ |  | 23 | $\begin{array}{\|l} 12 \\ 14 \\ \hline \end{array}$ | $\begin{array}{\|l} 10 \\ \mathbf{2 7} \\ \hline \end{array}$ | $\begin{aligned} & 23 \\ & 48 \\ & \hline \end{aligned}$ |  | 37 | $\begin{array}{r} 8 \\ 13 \\ \hline \end{array}$ | $\begin{aligned} & 27 \\ & 23 \end{aligned}$ | $\begin{array}{r} \mathbf{o} \\ 39 \end{array}$ |  | 50 | $\begin{array}{r} 0 \\ 12 \end{array}$ | $\begin{aligned} & 26 \\ & 19 \end{aligned}$ | $\begin{array}{\|l} 44 \\ 14 \\ \hline \end{array}$ |  | 1 | $\begin{array}{\|l} 47 \\ 11 \end{array}$ | $\begin{array}{\|l} 55 \\ 14 \\ \hline \end{array}$ | $\begin{aligned} & 29 \\ & 36 \\ & \hline \end{aligned}$ | 41 |
| 42 |  | 8 | $\begin{array}{\|l\|} \hline 27 \\ 15 \\ \hline \end{array}$ | $\begin{aligned} & 23 \\ & 30 \end{aligned}$ | $\begin{aligned} & 53 \\ & 38 \end{aligned}$ |  | 23 | $\begin{aligned} & 26 \\ & 14 \end{aligned}$ | $\begin{aligned} & 38 \\ & 26 \end{aligned}$ | $\begin{aligned} & 11 \\ & 44 \end{aligned}$ |  | 37 | $\begin{array}{\|l\|} \mathbf{2 1} \\ 13 \end{array}$ | $\begin{aligned} & 50 \\ & 22 \end{aligned}$ | $\begin{array}{\|l\|} \hline 39 \\ 34 \end{array}$ |  | 50 | $\begin{aligned} & 12 \\ & 12 \end{aligned}$ | $\begin{aligned} & 45 \\ & 18 \end{aligned}$ | $\begin{aligned} & 58 \\ & 10 \end{aligned}$ |  | 1 | $\begin{array}{\|l\|} \hline 59 \\ 11 \end{array}$ | $\begin{aligned} & 10 \\ & 10 \end{aligned}$ | $\begin{array}{r} 5 \\ 3^{2} \end{array}$ | 42 |
| 43 |  | 8 | $\begin{array}{\|l\|} \mathbf{4 2} \\ \mathbf{1 5} \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 54 \\ 29 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{3 1} \\ & \mathbf{3 4} \\ & \hline \end{aligned}$ |  | 23 | $\begin{array}{\|l} \mathbf{4 1} \\ \mathbf{1 4} \end{array}$ | $\begin{array}{r} 4 \\ 25 \\ \hline \end{array}$ | $\begin{array}{\|l} 55 \\ 40 \\ \hline \end{array}$ |  | 37 | $\begin{array}{\|l} 35 \\ 13 \end{array}$ | $\left\lvert\, \begin{aligned} & 13 \\ & 21 \end{aligned}\right.$ | $\begin{array}{\|l} 13 \\ 30 \\ \hline \end{array}$ |  | 50 | $\begin{aligned} & 25 \\ & 12 \end{aligned}$ | $\begin{array}{r} 4 \\ 17 \\ \hline \end{array}$ | $\begin{aligned} & 8 \\ & 5 \end{aligned}$ |  | 2 | $\begin{array}{\|l\|} 10 \\ 11 \end{array}$ | $\begin{array}{\|l} 23 \\ 12 \end{array}$ | $\begin{array}{\|l} \mathbf{3 7} \\ 27 \\ \hline \end{array}$ | 43 |
| 44 |  | 8 | $\begin{array}{\|l\|} \hline 58 \\ 15 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 24 \\ 28 \\ \hline \end{array}$ | $\begin{array}{r} 5 \\ 30 \end{array}$ |  | 23 | $\begin{aligned} & 55 \\ & 14 \end{aligned}$ | $\begin{array}{\|l} 30 \\ 24 \\ \hline \end{array}$ | $\begin{aligned} & 35 \\ & 36 \\ & \hline \end{aligned}$ |  | 37 | $\begin{aligned} & 48 \\ & 13 \end{aligned}$ | $\begin{aligned} & 34 \\ & 20 \end{aligned}$ | $\begin{aligned} & 43 \\ & 25 \end{aligned}$ |  | 50 | $\begin{aligned} & 37 \\ & 12 \end{aligned}$ | $\begin{aligned} & 21 \\ & 16 \end{aligned}$ | $\begin{array}{\|r} 13 \\ 1 \end{array}$ |  | 2 | $\begin{aligned} & \hline 21 \\ & 11 \end{aligned}$ | $\begin{aligned} & 36 \\ & 11 \\ & \hline \end{aligned}$ | $\begin{array}{r} 4 \\ 22 \end{array}$ | 44 |
| 45 |  | 9 | $\begin{array}{\|l\|} \hline 13 \\ 15 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \mathbf{5 2} \\ \mathbf{2 7} \\ \hline \end{array}$ | $\begin{aligned} & 35 \\ & 27 \\ & \hline \end{aligned}$ |  | 24 | $\begin{array}{r} 9 \\ 14 \end{array}$ | $\begin{array}{\|l} 55 \\ 23 \\ \hline \end{array}$ | $\begin{aligned} & 11 \\ & 3^{2} \\ & \hline \end{aligned}$ |  | $3^{8}$ | $\begin{array}{r} 1 \\ 13 \\ \hline \end{array}$ | $\begin{array}{\|l} 55 \\ 19 \\ \hline \end{array}$ | $\begin{array}{r} 8 \\ 22 \end{array}$ |  | 50 | $\begin{aligned} & 49 \\ & 12 \end{aligned}$ | $\begin{array}{\|l} 37 \\ 14 \\ \hline \end{array}$ | $\begin{array}{\|l} 14 \\ 56 \\ \hline \end{array}$ |  | 2 | $\begin{aligned} & 32 \\ & 11 \end{aligned}$ | $\begin{aligned} & 47 \\ & 10 \\ & \hline \end{aligned}$ | $\begin{aligned} & 26 \\ & 18 \end{aligned}$ | 45 |
| 46 |  | 9 | $\begin{array}{\|l\|} \hline 29 \\ 15 \\ \hline \end{array}$ | $\begin{aligned} & 20 \\ & 26 \end{aligned}$ | $\begin{array}{r} 2 \\ 23 \\ \hline \end{array}$ |  | 24 | $\begin{array}{\|l\|} \hline 24 \\ 14 \end{array}$ | $\begin{aligned} & 18 \\ & 22 \end{aligned}$ | $\begin{array}{\|l} 43 \\ 28 \end{array}$ |  | $3^{8}$ | $\begin{aligned} & 15 \\ & 13 \end{aligned}$ | $\begin{aligned} & 14 \\ & 18 \end{aligned}$ | $\begin{array}{\|l\|} \hline \mathbf{3 0} \\ \mathbf{1 7} \\ \hline \end{array}$ |  | 51 | $\begin{array}{r} 1 \\ 12 \end{array}$ | $\begin{aligned} & \mathbf{5 2} \\ & 13 \end{aligned}$ | $\begin{aligned} & 10 \\ & 52 \end{aligned}$ |  | 2 | $\begin{aligned} & 43 \\ & 11 \end{aligned}$ | $\begin{array}{r} 57 \\ 9 \\ \hline \end{array}$ | $\begin{aligned} & 44 \\ & 13 \\ & \hline \end{aligned}$ | 46 |
| 47 |  | 9 | $\begin{array}{\|l\|} \hline 44 \\ 15 \\ \hline \end{array}$ | $\begin{aligned} & 46 \\ & 25 \end{aligned}$ | $\begin{array}{\|l} 25 \\ 19 \end{array}$ |  | 24 | $\begin{aligned} & 38 \\ & 14 \end{aligned}$ | $\begin{aligned} & \mathbf{4 1} \\ & \mathbf{2 1} \end{aligned}$ | $\begin{aligned} & 11 \\ & 24 \\ & \hline \end{aligned}$ |  | $3^{8}$ | $\begin{aligned} & 28 \\ & 13 \\ & \hline \end{aligned}$ | $\begin{aligned} & \mathbf{3 2} \\ & 17 \end{aligned}$ | $\begin{array}{\|l\|} \hline 47 \\ 12 \end{array}$ |  | 51 | $\begin{aligned} & 14 \\ & 12 \\ & \hline \end{aligned}$ | $\begin{array}{r\|} 6 \\ 12 \end{array}$ | $\begin{array}{\|r} \hline \mathbf{2} \\ 47 \\ \hline \end{array}$ |  | 2 | $\begin{array}{\|l} 55 \\ 11 \end{array}$ | $\begin{aligned} & 6 \\ & 8 \end{aligned}$ | $\begin{array}{r} 57 \\ 8 \end{array}$ | 47 |
| 48 |  | 10 | $\begin{array}{\|r\|} \hline 0 \\ 15 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{1 1} \\ & 24 \end{aligned}$ | $\begin{array}{\|l\|} \hline 44 \\ 15 \end{array}$ |  | 24 | $\begin{array}{\|l} 53 \\ 14 \end{array}$ | $\begin{array}{r} 2 \\ 20 \end{array}$ | $\begin{aligned} & 35 \\ & 20 \end{aligned}$ |  | $3^{8}$ | $\begin{array}{\|l} \mathbf{4 1} \\ 13 \\ \hline \end{array}$ | $\begin{aligned} & 49 \\ & 16 \end{aligned}$ | $\begin{array}{r} 59 \\ 9 \\ \hline \end{array}$ |  | 51 | $\begin{aligned} & 26 \\ & 12 \end{aligned}$ | $\begin{array}{\|l\|} \hline 18 \\ 11 \end{array}$ | $\begin{aligned} & 49 \\ & 42 \end{aligned}$ |  | 3 | $\begin{array}{r} 6 \\ 11 \end{array}$ | $\begin{array}{r} 15 \\ \hline 7 \end{array}$ | $\begin{aligned} & 5 \\ & 3 \\ & \hline \end{aligned}$ | 48 |
| 49 |  | 10 | $\begin{array}{\|l} 15 \\ 15 \\ \hline \end{array}$ | $\begin{array}{\|l} 35 \\ 23 \\ \hline \end{array}$ | $\begin{array}{\|l} 59 \\ 12 \end{array}$ |  | 25 | $\begin{array}{r} 7 \\ 14 \\ \hline \end{array}$ | $\begin{array}{\|l} \mathbf{2 2} \\ 19 \end{array}$ | $\begin{array}{\|l} 55 \\ 15 \end{array}$ |  | $3^{8}$ | $\begin{array}{\|l} 55 \\ 13 \end{array}$ | $\begin{array}{r} 6 \\ 15 \\ \hline \end{array}$ | $\begin{aligned} & 8 \\ & 4 \end{aligned}$ |  | 51 | $\begin{aligned} & 3^{8} \\ & 12 \end{aligned}$ | $\begin{aligned} & 30 \\ & 10 \end{aligned}$ | $\begin{aligned} & \mathbf{3 1} \\ & \mathbf{3}^{8} \\ & \hline \end{aligned}$ |  | 3 | $\begin{aligned} & 17 \\ & 11 \end{aligned}$ | $\begin{array}{r} 22 \\ 5 \\ \hline \end{array}$ | $\begin{array}{r} 8 \\ 58 \end{array}$ | 49 |
| 50 | 58 | 10 | $\begin{array}{\|l\|} \hline 30 \\ 15 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 59 \\ 22 \end{array}$ | $\begin{array}{\|r} \mathbf{1 1} \\ 8 \end{array}$ | 58 | 25 | $\begin{array}{\|l\|} \mathbf{2 1} \\ 14 \end{array}$ | $\begin{aligned} & 42 \\ & 18 \end{aligned}$ | $\begin{aligned} & \hline 10 \\ & 12 \end{aligned}$ | 58 | 39 | $\begin{array}{r} 8 \\ 13 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 21 \\ 14 \\ \hline \end{array}$ | $\begin{array}{r} 12 \\ 0 \end{array}$ | 58 | 51 | $\begin{aligned} & 50 \\ & 12 \end{aligned}$ | $\begin{array}{r} 41 \\ 9 \end{array}$ | $\begin{array}{r} 9 \\ 34 \\ \hline \end{array}$ | 59 | 3 | $\begin{aligned} & \hline 28 \\ & 11 \end{aligned}$ | $\begin{array}{r} \hline 28 \\ 4 \\ \hline \end{array}$ | $\begin{array}{r} 6 \\ 54 \\ \hline \end{array}$ | 50 |
| 51 |  | 10 | $\begin{array}{\|l\|} \hline 46 \\ 15 \\ \hline \end{array}$ | $\begin{aligned} & 21 \\ & 21 \\ & \hline \end{aligned}$ | $\begin{array}{r} 19 \\ 4 \\ \hline \end{array}$ |  | 25 | $\begin{aligned} & 36 \\ & 14 \end{aligned}$ | $\begin{array}{\|r} \mathbf{0} \\ \mathbf{1 7} \\ \hline \end{array}$ | $\begin{array}{\|r} 22 \\ 7 \\ \hline \end{array}$ |  | 39 | $\begin{array}{\|l} \mathbf{2 1} \\ \mathbf{1 3} \end{array}$ | $\begin{aligned} & 35 \\ & 12 \\ & \hline \end{aligned}$ | $\begin{aligned} & 12 \\ & 55 \\ & \hline \end{aligned}$ |  | 52 | $\begin{array}{r} 2 \\ 12 \end{array}$ | $\begin{array}{r} 50 \\ 8 \end{array}$ | $\begin{aligned} & 43 \\ & 29 \\ & \hline \end{aligned}$ |  | 3 | $\begin{aligned} & 39 \\ & 11 \end{aligned}$ | $33$ | $\begin{array}{\|r} \hline \mathbf{o} \\ 49 \\ \hline \end{array}$ | 51 |
| 52 |  | 11 | $\begin{array}{r} \mathbf{1} \\ \mathbf{1 5} \\ \hline \end{array}$ | $\begin{aligned} & 42 \\ & 20 \end{aligned}$ | $\begin{array}{r} 23 \\ 0 \end{array}$ |  | 25 | $\begin{aligned} & 50 \\ & 14 \end{aligned}$ | $\begin{aligned} & 17 \\ & 16 \end{aligned}$ | $\begin{array}{r} 29 \\ 4 \end{array}$ |  | 39 | $\begin{aligned} & \hline 34 \\ & 13 \end{aligned}$ | $\begin{array}{\|l\|} \hline 48 \\ 11 \end{array}$ | $\begin{array}{r} 7 \\ 51 \\ \hline \end{array}$ |  | 52 | $\begin{aligned} & 14 \\ & 12 \end{aligned}$ | $\begin{array}{r} 59 \\ 7 \end{array}$ | $\begin{aligned} & 12 \\ & 24 \\ & \hline \end{aligned}$ |  | 3 | $\begin{array}{\|l} 50 \\ 11 \end{array}$ | $\begin{array}{r} 36 \\ 2 \end{array}$ | $\begin{aligned} & 49 \\ & 44 \end{aligned}$ | 52 |
| 53 |  | 11 | $\begin{array}{\|l\|} \hline 17 \\ 15 \\ \hline \end{array}$ | $\begin{array}{r} 2 \\ 18 \end{array}$ | $\begin{aligned} & 23 \\ & 56 \\ & \hline \end{aligned}$ |  | 26 | $\begin{array}{r} 4 \\ 14 \\ \hline \end{array}$ | $\begin{array}{\|l} 33 \\ 14 \\ \hline \end{array}$ | $\begin{aligned} & 33 \\ & 59 \end{aligned}$ |  | 39 | $\begin{array}{\|l} 47 \\ 13 \end{array}$ | $\begin{array}{l\|} \hline 59 \\ 10 \end{array}$ | $\begin{array}{\|l\|} \hline 58 \\ 47 \\ \hline \end{array}$ |  | 52 | $\begin{aligned} & 27 \\ & 12 \end{aligned}$ | $\begin{aligned} & 6 \\ & 6 \end{aligned}$ | $\begin{aligned} & 3^{6} \\ & 20 \end{aligned}$ |  | 4 | $\begin{array}{r} 11 \end{array}$ | $\begin{array}{r} 39 \\ 1 \end{array}$ | $\begin{aligned} & 33 \\ & 40 \\ & \hline \end{aligned}$ | 53 |
| 54 |  | 11 | $\begin{array}{\|l} \hline \mathbf{3 2}^{2} \\ 15 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 21 \\ 17 \\ \hline \end{array}$ | $\begin{array}{\|l} \mathbf{1 9} \\ 53 \\ \hline \end{array}$ |  | 26 | $\begin{aligned} & 18 \\ & 14 \end{aligned}$ | $\begin{aligned} & 48 \\ & 13 \end{aligned}$ | $\begin{aligned} & \mathbf{3 2} \\ & 55 \\ & \hline \end{aligned}$ |  | 40 | $\begin{array}{r} 1 \\ 13 \\ \hline \end{array}$ | $\begin{array}{r} 10 \\ 9 \\ \hline \end{array}$ | $\begin{aligned} & 45 \\ & 42 \\ & \hline \end{aligned}$ |  | 52 | $\begin{aligned} & 39 \\ & 12 \end{aligned}$ | $\begin{array}{r} 12 \\ 5 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 56 \\ 15 \\ \hline \end{array}$ |  | 4 | $\begin{array}{\|l\|} \hline 12 \\ 11 \end{array}$ | $\begin{gathered} 41 \\ 0 \end{gathered}$ | $\begin{array}{\|l\|} \hline 13 \\ 34 \\ \hline \end{array}$ | 54 |
| 55 |  | 11 | $\begin{aligned} & 47 \\ & 15 \\ & \hline \end{aligned}$ | $\begin{aligned} & 39 \\ & 16 \end{aligned}$ | $\begin{aligned} & 12 \\ & 48 \\ & \hline \end{aligned}$ |  | 26 | $\begin{aligned} & 33 \\ & 14 \end{aligned}$ | $\begin{array}{r} 2 \\ 12 \end{array}$ | $\begin{aligned} & 27 \\ & 5^{2} \\ & \hline \end{aligned}$ |  | 40 | $\begin{aligned} & 14 \\ & 13 \\ & \hline \end{aligned}$ | $\begin{array}{r} 20 \\ 8 \end{array}$ | $\begin{array}{r} 27 \\ 38 \\ \hline \end{array}$ |  | 52 | $\begin{aligned} & 51 \\ & 12 \\ & \hline \end{aligned}$ | $\begin{array}{\|r\|} \hline 18 \\ \hline \end{array}$ | $\begin{aligned} & 11 \\ & 10 \end{aligned}$ |  | 4 | $\begin{aligned} & 23 \\ & 10 \end{aligned}$ | $\begin{aligned} & \mathbf{4 1} \\ & 59 \end{aligned}$ | $\begin{aligned} & 47 \\ & 30 \\ & \hline \end{aligned}$ | 55 |
| 56 |  | 12 | $\begin{array}{\|r\|} \hline 2 \\ 15 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 56 \\ 15 \\ \hline \end{array}$ | $\begin{array}{\|r} \hline \mathbf{o} \\ 45 \\ \hline \end{array}$ |  | 26 | $\begin{array}{\|l} 47 \\ 14 \\ \hline \end{array}$ | $\begin{aligned} & 15 \\ & 11 \end{aligned}$ | $\begin{array}{\|l} \mathbf{1 9} \\ 47 \\ \hline \end{array}$ |  | 40 | $\begin{array}{\|l} 27 \\ 13 \\ \hline \end{array}$ | $\begin{array}{r} 29 \\ 7 \\ \hline \end{array}$ | $\begin{array}{r} 5 \\ 34 \\ \hline \end{array}$ |  | 53 | $\begin{array}{r} 3 \\ 12 \end{array}$ | $\begin{array}{\|r} 22 \\ 3 \\ \hline \end{array}$ | $\begin{array}{r} 21 \\ 6 \end{array}$ |  | 4 | $\begin{aligned} & 34 \\ & 10 \end{aligned}$ | $\begin{aligned} & \mathbf{4 1} \\ & 58 \\ & \hline \end{aligned}$ | $\begin{aligned} & 17 \\ & \mathbf{2 5} \\ & \hline \end{aligned}$ | 56 |
| 57 |  | 12 | $\begin{array}{\|l\|} \hline 18 \\ 15 \\ \hline \end{array}$ | $\begin{array}{\|l} \mathbf{1 1} \\ 14 \\ \hline \end{array}$ | $\begin{array}{\|l} 45 \\ 41 \\ \hline \end{array}$ |  | 27 | $\begin{array}{\|r} 1 \\ 14 \\ \hline \end{array}$ | $\begin{aligned} & 27 \\ & 10 \end{aligned}$ | $\begin{array}{r} 6 \\ 43 \\ \hline \end{array}$ |  | 40 | $\begin{aligned} & 40 \\ & 13 \\ & \hline \end{aligned}$ | $\begin{array}{r} 36 \\ 6 \end{array}$ | $\begin{aligned} & 39 \\ & 30 \\ & \hline \end{aligned}$ |  | 53 | $\begin{aligned} & 15 \\ & 12 \end{aligned}$ | $\begin{array}{r} 25 \\ 2 \end{array}$ | $\begin{array}{r} 27 \\ 2 \end{array}$ |  | 4 | $\begin{aligned} & 45 \\ & 10 \end{aligned}$ | $\begin{aligned} & 39 \\ & 57 \\ & \hline \end{aligned}$ | $\begin{aligned} & \hline \mathbf{4 2} \\ & 21 \end{aligned}$ | 57 |
| 58 |  | 12 | $\begin{aligned} & 33 \\ & 15 \\ & \hline \end{aligned}$ | $\begin{aligned} & 26 \\ & 13 \\ & \hline \end{aligned}$ | $\begin{aligned} & 26 \\ & 37 \\ & \hline \end{aligned}$ |  | 27 | $\begin{array}{\|l} 15 \\ 14 \end{array}$ | $\begin{array}{r} 37 \\ 9 \\ \hline \end{array}$ | $\begin{aligned} & 49 \\ & 39 \end{aligned}$ |  | 40 | $\begin{array}{\|l} 53 \\ 13 \\ \hline \end{array}$ | $\begin{array}{r} 43 \\ 5 \\ \hline \end{array}$ | $\begin{array}{r} 9 \\ 25 \\ \hline \end{array}$ |  | 53 | $\begin{aligned} & 27 \\ & 12 \end{aligned}$ | $\begin{array}{r} 27 \\ 0 \end{array}$ | $\begin{array}{\|} 29 \\ 57 \\ \hline \end{array}$ |  | 4 | $\begin{aligned} & 56 \\ & 10 \end{aligned}$ | $\begin{aligned} & 37 \\ & 56 \\ & \hline \end{aligned}$ | $\begin{array}{r} 3 \\ 15 \\ \hline \end{array}$ | 58 |
| 59 |  | 12 | $\begin{array}{\|l\|} \hline 48 \\ 15 \\ \hline \end{array}$ | $\left\lvert\, \begin{aligned} & 40 \\ & 12 \end{aligned}\right.$ | $\begin{array}{r} 3 \\ 34 \\ \hline \end{array}$ |  | 27 | $\begin{array}{\|l} 29 \\ 14 \end{array}$ | $\begin{array}{\|r} 47 \\ 8 \end{array}$ | $\begin{aligned} & \mathbf{2 8} \\ & 34 \end{aligned}$ |  | 41 | $\begin{array}{r} 6 \\ 13 \end{array}$ | $\begin{array}{r} 48 \\ 4 \\ \hline \end{array}$ | $\begin{aligned} & 34 \\ & 20 \end{aligned}$ |  | 53 | $39$ | $\begin{aligned} & 28 \\ & 59 \end{aligned}$ | $\begin{aligned} & 26 \\ & 52 \end{aligned}$ |  | 5 | $\begin{array}{r} 7 \\ 10 \end{array}$ | $\begin{aligned} & 33 \\ & 55 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 18 \\ 11 \end{array}$ | 59 |
| 60 | 58 | 13 | $\begin{array}{r} 3 \\ 15 \\ \hline \end{array}$ | $\begin{aligned} & 52 \\ & 11 \end{aligned}$ | $\begin{array}{\|l} 37 \\ 29 \\ \hline \end{array}$ | 58 | 27 | $\begin{array}{\|l} 43 \\ 14 \end{array}$ | $\begin{array}{r} 56 \\ 7 \end{array}$ | $\begin{array}{r} 2 \\ 3^{1} \end{array}$ | 58 | 41 | $\begin{aligned} & 19 \\ & 13 \end{aligned}$ | $\begin{array}{\|r\|} \hline 52 \\ 3 \end{array}$ | $\begin{array}{\|l} \mathbf{5 4} \\ \mathbf{1} 7 \\ \hline \end{array}$ | 58 | 53 | $\begin{aligned} & 51 \\ & 11 \end{aligned}$ | $\begin{aligned} & \mathbf{2 8} \\ & 58 \end{aligned}$ | $\begin{aligned} & 18 \\ & 48 \end{aligned}$ | 59 | 5 | $\begin{aligned} & 18 \\ & 10 \end{aligned}$ | $\begin{aligned} & \mathbf{2 8} \\ & 54 \end{aligned}$ | $\begin{array}{r} 29 \\ 6 \end{array}$ | 60 |

Bürgi's 1' sine table (reconstruction, D. Roegel, 2016)

| 1 | $80^{\circ}$ |  |  |  |  | $81^{\circ}$ |  |  |  |  | $82^{\circ}$ |  |  |  |  | $83^{\circ}$ |  |  |  |  | $84^{\circ}$ |  |  |  |  | , |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 0 | 59 | 5 | $\begin{array}{\|l\|} \hline 18 \\ 10 \end{array}$ | $\begin{aligned} & \mathbf{2 8} \\ & 54 \\ & \hline \end{aligned}$ | $\begin{array}{r} 29 \\ 6 \end{array}$ | 59 | 15 | $\begin{array}{r} 40 \\ 9 \\ \hline \end{array}$ | $\begin{aligned} & 4 \mathbf{4 0} \\ & 49 \end{aligned}$ | $\begin{array}{\|l\|} 54 \\ 12 \end{array}$ | 59 | 24 | $\begin{array}{r} 57 \\ 8 \end{array}$ | $\begin{aligned} & 54 \\ & 44 \end{aligned}$ | $\begin{array}{r} 10 \\ 8 \end{array}$ | 59 | 33 | $\begin{aligned} & 9 \\ & 7 \end{aligned}$ | $\begin{array}{\|l} \hline 58 \\ 38 \\ \hline \end{array}$ | $\begin{array}{r} 8 \\ 53 \\ \hline \end{array}$ | 59 | 40 | $\begin{array}{r} 16 \\ 6 \end{array}$ | $\begin{aligned} & 43 \\ & 33 \end{aligned}$ | $\begin{array}{\|l\|} \hline 4^{6} \\ 31 \\ \hline \end{array}$ | 0 |
| 1 |  | 5 | $\begin{aligned} & 29 \\ & 10 \end{aligned}$ | $\begin{aligned} & 22 \\ & 53 \end{aligned}$ | $\left[\begin{array}{c} 35 \\ 1 \end{array}\right.$ |  | 15 | $\begin{array}{r} 50 \\ 9 \\ \hline \end{array}$ | $\begin{array}{\|l} 30 \\ 48 \\ \hline \end{array}$ | $\begin{aligned} & 6 \\ & 7 \end{aligned}$ |  | 25 | $\begin{aligned} & 6 \\ & 8 \end{aligned}$ | $\begin{aligned} & 38 \\ & 43 \end{aligned}$ | $\begin{array}{r} 18 \\ 2 \end{array}$ |  | 33 | $\begin{array}{r} 17 \\ 7 \\ \hline \end{array}$ | $\begin{array}{\|l} 37 \\ 37 \\ \hline \end{array}$ | $\begin{array}{\|r} 1 \\ 4^{8} \\ \hline \end{array}$ |  | 40 | $\begin{array}{r} 23 \\ 6 \end{array}$ | $\begin{aligned} & 17 \\ & 3^{2} \\ & \hline \end{aligned}$ | $\begin{aligned} & 17 \\ & 26 \end{aligned}$ | 1 |
| 2 |  | 5 | $\begin{aligned} & 40 \\ & 10 \end{aligned}$ | $\begin{array}{\|l\|} \hline 15 \\ 51 \\ \hline \end{array}$ | $\begin{aligned} & 36 \\ & 56 \\ & \hline \end{aligned}$ |  | 16 | $\begin{aligned} & \hline \mathbf{o} \\ & 9 \\ & \hline \end{aligned}$ | $\begin{aligned} & 18 \\ & 47 \\ & \hline \end{aligned}$ | $\begin{array}{r} 13 \\ 2 \end{array}$ |  | 25 | $\begin{array}{r} 15 \\ 8 \end{array}$ | $\begin{aligned} & 21 \\ & 41 \\ & \hline \end{aligned}$ | $\begin{aligned} & 20 \\ & 58 \\ & \hline \end{aligned}$ |  | 33 | $\begin{array}{r} 25 \\ 7 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline \mathbf{1 4} \\ 36 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 49 \\ 43 \\ \hline \end{array}$ |  | 40 | $\begin{array}{r} 29 \\ 6 \end{array}$ | $\begin{aligned} & 49 \\ & 31 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 43 \\ 20 \end{array}$ | 2 |
| 3 |  | 5 | $\begin{aligned} & 51 \\ & 10 \end{aligned}$ | $\begin{array}{r} 7 \\ 50 \\ \hline \end{array}$ | $\begin{aligned} & 32 \\ & 5^{1} \\ & \hline \end{aligned}$ |  | 16 | $\begin{array}{r} 10 \\ 9 \\ \hline \end{array}$ | $\begin{array}{r} 5 \\ 45 \\ \hline \end{array}$ | $\begin{array}{\|l} \mathbf{1 5} \\ 57 \\ \hline \end{array}$ |  | 25 | $\begin{array}{r} 24 \\ 8 \end{array}$ | $\begin{array}{r} 3 \\ 40 \\ \hline \end{array}$ | $\begin{aligned} & 18 \\ & 52 \end{aligned}$ |  | 33 | $\begin{array}{r} \mathbf{3 2} \\ 7 \\ \hline \end{array}$ | $\begin{array}{\|l} \mathbf{5 1} \\ \mathbf{3 5} \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{3 2} \\ & 38 \\ & \hline \end{aligned}$ |  | 40 | $\begin{array}{r} 36 \\ 6 \end{array}$ | $\begin{array}{\|l} 21 \\ 30 \\ \hline \end{array}$ | $\begin{array}{r} 3 \\ 14 \\ \hline \end{array}$ | 3 |
| 4 |  | 6 | $\begin{array}{r} 1 \\ 10 \end{array}$ | $\begin{aligned} & 58 \\ & 49 \end{aligned}$ | $\begin{aligned} & 23 \\ & 47 \\ & \hline \end{aligned}$ |  | 16 | $\begin{array}{r} 19 \\ 9 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \mathbf{5 1} \\ \mathbf{4 4} \end{array}$ | $\begin{array}{\|l} 12 \\ 52 \\ \hline \end{array}$ |  | 25 | $\begin{array}{r} 32 \\ 8 \end{array}$ | $\begin{aligned} & 44 \\ & 39 \end{aligned}$ | $\begin{aligned} & \mathbf{1 0} \\ & 47 \end{aligned}$ |  | 33 | $\begin{array}{r} 40 \\ 7 \end{array}$ | $\begin{aligned} & \hline 27 \\ & 34 \end{aligned}$ | $\begin{aligned} & 10 \\ & 32 \\ & \hline \end{aligned}$ |  | 40 | $\begin{array}{r} 42 \\ 6 \end{array}$ | $\begin{array}{\|l\|l} \mathbf{5 1} \\ \mathbf{2} \end{array}$ | $\begin{array}{\|l\|} \hline 17 \\ 10 \end{array}$ | 4 |
| 5 |  | 6 | $\begin{aligned} & 12 \\ & 10 \end{aligned}$ | $\begin{aligned} & 48 \\ & 48 \\ & \hline \end{aligned}$ | $\begin{aligned} & 10 \\ & 42 \\ & \hline \end{aligned}$ |  | 16 | $\begin{array}{r} 29 \\ 9 \\ \hline \end{array}$ | $\begin{aligned} & 36 \\ & 43 \\ & \hline \end{aligned}$ | $\begin{array}{r} 4 \\ 48 \\ \hline \end{array}$ |  | 25 | $\begin{array}{r} 41 \\ 8 \end{array}$ | $\begin{aligned} & 23 \\ & 38 \\ & \hline \end{aligned}$ | $\begin{aligned} & 57 \\ & 42 \\ & \hline \end{aligned}$ |  | 33 | $\begin{array}{r} 48 \\ 7 \\ \hline \end{array}$ | $\begin{array}{r} \mathbf{1} \\ 33 \\ \hline \end{array}$ | $\begin{aligned} & 42 \\ & 27 \\ & \hline \end{aligned}$ |  | 40 | $\begin{array}{r} 49 \\ 6 \end{array}$ | $\begin{aligned} & 20 \\ & 28 \end{aligned}$ | $\begin{array}{r} 27 \\ \hline 4 \\ \hline \end{array}$ | 5 |
| 6 |  | 6 | $\begin{aligned} & 23 \\ & 10 \end{aligned}$ | $\begin{aligned} & 36 \\ & 47 \end{aligned}$ | $\begin{array}{\|l} \mathbf{5 2} \\ \mathbf{3 7} \\ \hline \end{array}$ |  | 16 | $\begin{array}{r} 39 \\ 9 \\ \hline \end{array}$ | $\begin{aligned} & 19 \\ & 4^{2} \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 52 \\ 4^{2} \\ \hline \end{array}$ |  | 25 | $\begin{array}{r} 50 \\ 8 \end{array}$ | $\begin{array}{r} \mathbf{2} \\ 37 \\ \hline \end{array}$ | $\begin{aligned} & 39 \\ & 36 \\ & \hline \end{aligned}$ |  | 33 | $\begin{array}{r} 55 \\ 7 \\ \hline \end{array}$ | $\begin{array}{\|l} 35 \\ 32 \\ \hline \end{array}$ | $\begin{array}{r} 9 \\ 22 \end{array}$ |  | 40 | $\begin{array}{r} 55 \\ 6 \end{array}$ | $\begin{aligned} & 48 \\ & 26 \end{aligned}$ | $\begin{aligned} & \mathbf{3 1} \\ & 58 \end{aligned}$ | 6 |
| 7 |  | 6 | $\begin{aligned} & 34 \\ & 10 \end{aligned}$ | $\begin{aligned} & 24 \\ & 46 \end{aligned}$ | $\begin{aligned} & 29 \\ & 32 \end{aligned}$ |  | 16 | $\begin{array}{r} 49 \\ 9 \\ \hline \end{array}$ | $\begin{array}{r} 2 \\ 41 \\ \hline \end{array}$ | $\begin{array}{\|l} 34 \\ 37 \\ \hline \end{array}$ |  | 25 | $\begin{array}{r} 58 \\ 8 \end{array}$ | $\begin{aligned} & 40 \\ & 36 \end{aligned}$ | $\begin{aligned} & 15 \\ & 32 \\ & \hline \end{aligned}$ |  | 34 | $\begin{aligned} & 3 \\ & 7 \\ & \hline \end{aligned}$ | $\begin{array}{r} 7 \\ 3^{7} \end{array}$ | $\begin{aligned} & \mathbf{3 1} \\ & \mathbf{1 6} \end{aligned}$ |  | 41 | $\begin{aligned} & 2 \\ & 6 \end{aligned}$ | $\begin{aligned} & 15 \\ & 25 \end{aligned}$ | $\begin{aligned} & 29 \\ & 53 \end{aligned}$ | 7 |
| 8 |  | 6 | $\begin{aligned} & 45 \\ & 10 \end{aligned}$ | $\begin{array}{\|l\|} \hline 11 \\ 45 \\ \hline \end{array}$ | $\begin{array}{r} \mathbf{1} \\ \mathbf{2 8} \end{array}$ |  | 16 | $\begin{array}{r} 58 \\ 9 \\ \hline \end{array}$ | $\begin{array}{\|l} 44 \\ 40 \\ \hline \end{array}$ | $\begin{aligned} & 11 \\ & 3^{2} \\ & \hline \end{aligned}$ |  | 26 | $\begin{aligned} & 7 \\ & 8 \end{aligned}$ | $\begin{aligned} & 16 \\ & 35 \end{aligned}$ | $\begin{aligned} & 47 \\ & 26 \end{aligned}$ |  | 34 | $\begin{array}{r} 10 \\ 7 \\ \hline \end{array}$ | $\begin{aligned} & \hline 3^{8} \\ & 30 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 47 \\ 11 \end{array}$ |  | 41 | $\begin{aligned} & 8 \\ & 6 \end{aligned}$ | $\begin{aligned} & \mathbf{4 1} \\ & \mathbf{2 4} \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 22 \\ 47 \\ \hline \end{array}$ | 8 |
| 9 |  | 6 | $\begin{aligned} & 55 \\ & 10 \end{aligned}$ | $\begin{aligned} & 56 \\ & 44 \end{aligned}$ | $\left\lvert\, \begin{aligned} & 29 \\ & 22 \end{aligned}\right.$ |  | 17 | $\begin{aligned} & \hline 8 \\ & 9 \\ & \hline \end{aligned}$ | $\begin{aligned} & 24 \\ & 39 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 43 \\ 27 \\ \hline \end{array}$ |  | 26 | $\begin{array}{r} 15 \\ 8 \end{array}$ | $\begin{aligned} & 5^{2} \\ & 34 \end{aligned}$ | $\left\lvert\, \begin{aligned} & 13 \\ & 21 \end{aligned}\right.$ |  | 34 | $\begin{array}{r} 18 \\ 7 \end{array}$ | $\begin{array}{r} 8 \\ 29 \\ \hline \end{array}$ | $\begin{array}{r} 58 \\ 6 \end{array}$ |  | 41 | $\begin{array}{r} 15 \\ 6 \end{array}$ | $\begin{array}{r} 6 \\ 23 \\ \hline \end{array}$ | $\begin{array}{r} 9 \\ 42 \end{array}$ | 9 |
| 10 | 59 | 7 | $\begin{array}{r} 6 \\ 10 \end{array}$ | $\begin{aligned} & 40 \\ & 43 \end{aligned}$ | $\begin{aligned} & \mathbf{5 1} \\ & 18 \end{aligned}$ | 59 | 17 | $\begin{array}{r} 18 \\ 9 \\ \hline \end{array}$ | $\begin{array}{r} 4 \\ 3^{8} \\ \hline \end{array}$ | $\begin{aligned} & 10 \\ & 22 \end{aligned}$ | 59 | 26 | $\begin{array}{r} 24 \\ 8 \end{array}$ | $\begin{aligned} & \mathbf{2 6} \\ & 33 \end{aligned}$ | $\begin{aligned} & 34 \\ & 16 \end{aligned}$ | 59 | 34 | $\begin{array}{r} 25 \\ 7 \\ \hline \end{array}$ | $\begin{aligned} & 38 \\ & 28 \end{aligned}$ | $\begin{aligned} & 4 \\ & 0 \end{aligned}$ | 59 | 41 | $\begin{array}{r} 21 \\ 6 \end{array}$ | $\begin{aligned} & 29 \\ & 22 \end{aligned}$ | $\begin{array}{\|l} \hline \mathbf{5 1} \\ 37 \\ \hline \end{array}$ | 10 |
| 11 |  | 7 | $\begin{aligned} & 17 \\ & 10 \end{aligned}$ | $\begin{aligned} & 24 \\ & 42 \\ & \hline \end{aligned}$ | $\begin{array}{r} 9 \\ 13 \\ \hline \end{array}$ |  | 17 | $\begin{array}{r} 27 \\ 9 \\ \hline \end{array}$ | $\begin{aligned} & 42 \\ & 37 \\ & \hline \end{aligned}$ | $\begin{aligned} & \mathbf{3 2} \\ & 17 \\ & \hline \end{aligned}$ |  | 26 | $\begin{array}{r} 32 \\ 8 \end{array}$ | $\begin{aligned} & 59 \\ & 32 \end{aligned}$ | $\left\lvert\, \begin{aligned} & 50 \\ & 11 \end{aligned}\right.$ |  | 34 | $\begin{array}{r} 33 \\ \hline 7 \\ \hline \end{array}$ | $\begin{array}{r} 6 \\ 26 \end{array}$ | $\begin{array}{r} 4 \\ 55 \\ \hline \end{array}$ |  | 41 | $\begin{array}{r} 27 \\ 6 \end{array}$ | $\begin{aligned} & 52 \\ & 21 \end{aligned}$ | $\begin{aligned} & 28 \\ & 31 \end{aligned}$ | 11 |
| 12 |  | 7 | $\begin{aligned} & 28 \\ & 10 \end{aligned}$ | $\begin{array}{r} 6 \\ 41 \end{array}$ | $\begin{array}{r} 22 \\ 8 \end{array}$ |  | 17 | $\begin{array}{r} 37 \\ 9 \\ \hline \end{array}$ | $\begin{aligned} & 19 \\ & 36 \\ & \hline \end{aligned}$ | $\begin{aligned} & 49 \\ & 12 \end{aligned}$ |  | 26 | $\begin{array}{r} 41 \\ 8 \end{array}$ | $\begin{aligned} & 3^{2} \\ & 3^{1} \end{aligned}$ | $\begin{aligned} & 1 \\ & 5 \\ & \hline \end{aligned}$ |  | 34 | $\begin{array}{r} 40 \\ 7 \end{array}$ | $\begin{array}{\|l} \hline 32 \\ 25 \\ \hline \end{array}$ | $\begin{aligned} & 59 \\ & 50 \\ & \hline \end{aligned}$ |  | 41 | $\begin{array}{r} 34 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 13 \\ 20 \end{array}$ | $\begin{aligned} & 59 \\ & 26 \end{aligned}$ | 12 |
| 13 |  | 7 | $\begin{aligned} & 38 \\ & 10 \end{aligned}$ | $\begin{aligned} & 47 \\ & 40 \\ & \hline \end{aligned}$ | $\begin{gathered} \mathbf{3 0} \\ 3 \\ \hline \end{gathered}$ |  | 17 | $\begin{array}{r} 46 \\ 9 \\ \hline \end{array}$ | $\begin{aligned} & 56 \\ & 35 \end{aligned}$ | $\begin{aligned} & \mathbf{1} \\ & 8 \end{aligned}$ |  | 26 | $\begin{array}{r} 50 \\ 8 \end{array}$ | $\begin{array}{r} 3 \\ 30 \end{array}$ | $\begin{aligned} & \hline 6 \\ & 1 \\ & \hline \end{aligned}$ |  | 34 | $\begin{array}{r} 47 \\ \hline 7 \\ \hline \end{array}$ | $\begin{aligned} & 58 \\ & 24 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 49 \\ 44 \\ \hline \end{array}$ |  | 41 | $\begin{array}{r} 40 \\ 6 \end{array}$ | $\begin{array}{\|l} 34 \\ 19 \\ \hline \end{array}$ | $\begin{aligned} & 25 \\ & 20 \end{aligned}$ | 13 |
| 14 |  | 7 | $\begin{aligned} & 49 \\ & 10 \end{aligned}$ | $\begin{aligned} & 27 \\ & 38 \\ & \hline \end{aligned}$ | $\begin{aligned} & 33 \\ & 59 \\ & \hline \end{aligned}$ |  | 17 | $\begin{array}{r} 56 \\ 9 \\ \hline \end{array}$ | $\begin{aligned} & \hline \mathbf{3 1} \\ & 34 \\ & \hline \end{aligned}$ | $\begin{aligned} & 9 \\ & 2 \end{aligned}$ |  | 26 | $\begin{array}{r} 58 \\ 8 \end{array}$ | $\begin{aligned} & 33 \\ & 28 \end{aligned}$ | $\begin{array}{r} 7 \\ 55 \\ \hline \end{array}$ |  | 34 | $\begin{array}{r} 55 \\ 7 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 23 \\ 23 \\ \hline \end{array}$ | $\begin{aligned} & 33 \\ & 39 \\ & \hline \end{aligned}$ |  | 41 | $\begin{array}{r} 46 \\ 6 \end{array}$ | $\begin{array}{\|l} 53 \\ 18 \end{array}$ | $\begin{aligned} & 45 \\ & 15 \\ & \hline \end{aligned}$ | 14 |
| 15 |  | 8 | $\begin{array}{r} 0 \\ 10 \\ \hline \end{array}$ | $\begin{array}{\|r\|} \hline 6 \\ 37 \\ \hline \end{array}$ | $\begin{array}{\|l\|l\|} \hline \mathbf{3 2} \\ 53 \\ \hline \end{array}$ |  | 18 | $\begin{aligned} & \hline 6 \\ & 9 \\ & \hline \end{aligned}$ | $\begin{array}{r} 5 \\ 3^{2} \end{array}$ | $\begin{array}{\|l\|} \mathbf{1 1} \\ 57 \\ \hline \end{array}$ |  | 27 | $\begin{aligned} & 7 \\ & 8 \end{aligned}$ | $\begin{array}{r} 2 \\ 27 \\ \hline \end{array}$ | $\begin{array}{r} 2 \\ 50 \\ \hline \end{array}$ |  | 35 | $\begin{aligned} & 2 \\ & 7 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 47 \\ 22 \end{array}$ | $\begin{aligned} & \mathbf{1 2} \\ & \mathbf{3 4} \\ & \hline \end{aligned}$ |  | 41 | $\begin{array}{r} 53 \\ 6 \end{array}$ | $\begin{array}{\|l} 12 \\ 17 \\ \hline \end{array}$ | $\begin{aligned} & \hline \mathbf{o} \\ & 9 \\ & \hline \end{aligned}$ | 15 |
| 16 |  | 8 | $\begin{aligned} & 10 \\ & 10 \end{aligned}$ | $\begin{aligned} & 44 \\ & 36 \end{aligned}$ | $\begin{array}{\|l} \mathbf{2 5} \\ 49 \\ \hline \end{array}$ |  | 18 | $\begin{array}{r} 15 \\ 9 \\ \hline \end{array}$ | $\begin{aligned} & 3^{8} \\ & 3^{1} \\ & \hline \end{aligned}$ | $\begin{array}{r} 8 \\ 51 \\ \hline \end{array}$ |  | 27 | $\begin{array}{r} 15 \\ 8 \end{array}$ | $\begin{aligned} & 29 \\ & 26 \end{aligned}$ | $\begin{aligned} & 52 \\ & 45 \end{aligned}$ |  | 35 | $\begin{array}{r} 10 \\ 7 \end{array}$ | $\begin{array}{r} 9 \\ 21 \end{array}$ | $\begin{aligned} & 46 \\ & 28 \end{aligned}$ |  | 41 | $\begin{array}{r} 59 \\ 6 \end{array}$ | $\begin{aligned} & 29 \\ & 16 \end{aligned}$ | $9$ | 16 |
| 17 |  | 8 | $\begin{aligned} & 21 \\ & 10 \end{aligned}$ | $\begin{aligned} & 21 \\ & 35 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \mathbf{1 4} \\ 44 \\ \hline \end{array}$ |  | 18 | $\begin{array}{r} 25 \\ 9 \\ \hline \end{array}$ | $\begin{array}{r} 9 \\ 30 \\ \hline \end{array}$ | $\begin{array}{\|l} 59 \\ 47 \\ \hline \end{array}$ |  | 27 | $\begin{array}{r} 23 \\ 8 \end{array}$ | $\begin{aligned} & 56 \\ & 25 \end{aligned}$ | $\begin{aligned} & 37 \\ & 39 \\ & \hline \end{aligned}$ |  | 35 | $\begin{array}{r} 17 \\ 7 \\ \hline \end{array}$ | $\begin{aligned} & 31 \\ & 20 \end{aligned}$ | $\begin{array}{\|l} 14 \\ 23 \\ \hline \end{array}$ |  | 42 | $\begin{aligned} & 5 \\ & 6 \end{aligned}$ | $\begin{aligned} & 45 \\ & 14 \end{aligned}$ | $\begin{aligned} & 13 \\ & 58 \\ & \hline \end{aligned}$ | 17 |
| 18 |  | 8 | $\begin{array}{\|l\|} \hline 31 \\ 10 \end{array}$ | $\begin{array}{\|l\|} \hline 56 \\ 34 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 58 \\ 39 \\ \hline \end{array}$ |  | 18 | $\begin{array}{r} 34 \\ 9 \end{array}$ | $\begin{aligned} & 40 \\ & 29 \end{aligned}$ | $\begin{aligned} & 46 \\ & 42 \end{aligned}$ |  | 27 | $\begin{array}{r} 32 \\ 8 \end{array}$ | $\begin{aligned} & 22 \\ & 24 \\ & \hline \end{aligned}$ | $\begin{aligned} & 16 \\ & 34 \end{aligned}$ |  | 35 | $\begin{array}{\|r\|} \hline 24 \\ 7 \\ \hline \end{array}$ | $\begin{array}{\|l} \mathbf{5 1} \\ \mathbf{1 9} \\ \hline \end{array}$ | $\begin{array}{\|l} 37 \\ 18 \end{array}$ |  | 42 | $\begin{array}{r} 12 \\ 6 \end{array}$ | $\begin{array}{r} \mathbf{o} \\ \mathbf{1} 3 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{1 1} \\ & 53 \end{aligned}$ | 18 |
| 19 |  | 8 | $\begin{aligned} & 42 \\ & 10 \end{aligned}$ | $\begin{array}{\|l} \mathbf{3 1} \\ \mathbf{3 3} \\ \hline \end{array}$ | $\begin{array}{\|l} \mathbf{3 7} \\ \mathbf{3 4} \\ \hline \end{array}$ |  | 18 | $\begin{array}{r} 44 \\ 9 \\ \hline \end{array}$ | $\begin{array}{\|l} 10 \\ 28 \end{array}$ | $\begin{aligned} & 28 \\ & 37 \end{aligned}$ |  | 27 | $\begin{array}{r} 40 \\ 8 \end{array}$ | $\begin{aligned} & 46 \\ & 23 \end{aligned}$ | $\begin{aligned} & 50 \\ & 30 \\ & \hline \end{aligned}$ |  | 35 | $\begin{array}{r} 3^{2} \\ 7 \end{array}$ | $\begin{array}{\|l} 10 \\ 18 \end{array}$ | $\begin{array}{\|l} 55 \\ 12 \end{array}$ |  | 42 | $\begin{array}{r} 18 \\ 6 \end{array}$ | $\begin{aligned} & 14 \\ & 12 \end{aligned}$ | $\begin{array}{r} 4 \\ 47 \\ \hline \end{array}$ | 19 |
| 20 | 59 | 8 | $\begin{array}{\|l} 53 \\ 10 \end{array}$ | $\begin{array}{r} 5 \\ 3^{2} \end{array}$ | $\begin{array}{\|l\|l} 11 \\ 29 \\ \hline \end{array}$ | 59 | 18 | $\begin{array}{r} 53 \\ 9 \\ \hline \end{array}$ | $\begin{array}{\|l} 39 \\ 27 \\ \hline \end{array}$ | $\begin{array}{r} 5 \\ 3^{2} \end{array}$ | 59 | 27 | $\begin{array}{r} 49 \\ 8 \end{array}$ | $\begin{array}{\|l} 10 \\ 22 \end{array}$ | $\begin{aligned} & 20 \\ & 24 \\ & \hline \end{aligned}$ | 59 | 35 | $\begin{array}{r} 39 \\ 7 \end{array}$ | $\begin{array}{\|l} 29 \\ 17 \end{array}$ | $\begin{aligned} & 7 \\ & 7 \end{aligned}$ | 59 | 42 | $\begin{array}{r} 24 \\ 6 \end{array}$ | $\begin{array}{\|l\|} \hline 26 \\ 11 \end{array}$ | $\begin{array}{\|l} \hline 51 \\ 42 \\ \hline \end{array}$ | 20 |
| 21 |  | 9 | $\begin{array}{r} 3 \\ 10 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 37 \\ 31 \\ \hline \end{array}$ | $\begin{aligned} & 40 \\ & 24 \\ & \hline \end{aligned}$ |  | 19 | $\begin{aligned} & \hline 3 \\ & 9 \end{aligned}$ | $\begin{array}{r} 6 \\ 26 \\ \hline \end{array}$ | $\begin{aligned} & 37 \\ & 27 \\ & \hline \end{aligned}$ |  | 27 | $\begin{array}{r} 57 \\ 8 \end{array}$ | $\begin{aligned} & 32 \\ & 21 \end{aligned}$ | $\begin{aligned} & 44 \\ & 18 \end{aligned}$ |  | 35 | $\begin{array}{r} 46 \\ 7 \\ \hline \end{array}$ | $\begin{aligned} & 46 \\ & 16 \end{aligned}$ | $\begin{array}{\|c\|} 14 \\ 1 \end{array}$ |  | 42 | $\begin{array}{r} 30 \\ 6 \end{array}$ | $\begin{aligned} & 38 \\ & 10 \end{aligned}$ | $\begin{array}{\|l\|} \hline 33 \\ 37 \\ \hline \end{array}$ | 21 |
| 22 |  | 9 | $\begin{aligned} & 14 \\ & 10 \end{aligned}$ | $\begin{array}{r} 9 \\ 30 \\ \hline \end{array}$ | $\begin{array}{r} 4 \\ 20 \end{array}$ |  | 19 | $\begin{array}{r} 12 \\ 9 \end{array}$ | $\begin{aligned} & 33 \\ & 25 \\ & \hline \end{aligned}$ | $\begin{array}{r} 4 \\ 21 \end{array}$ |  | 28 | $\begin{aligned} & \mathbf{5} \\ & 8 \end{aligned}$ | $\begin{aligned} & 54 \\ & 20 \end{aligned}$ | $\begin{array}{r} 2 \\ 14 \\ \hline \end{array}$ |  | 35 | $\begin{array}{r} 54 \\ 7 \\ \hline \end{array}$ | $\begin{array}{r} 2 \\ 14 \\ \hline \end{array}$ | $\begin{array}{\|l} 15 \\ 57 \\ \hline \end{array}$ |  | 42 | $\begin{array}{r} 36 \\ 6 \end{array}$ | $\begin{array}{r} 49 \\ 9 \\ \hline \end{array}$ | $\begin{aligned} & 10 \\ & 31 \\ & \hline \end{aligned}$ | 22 |
| 23 |  | 9 | $\begin{array}{\|l\|} 24 \\ 10 \\ \hline \end{array}$ | $\begin{aligned} & 39 \\ & 29 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 24 \\ 14 \\ \hline \end{array}$ |  | 19 | $\begin{array}{r} 21 \\ 9 \\ \hline \end{array}$ | $\begin{aligned} & 58 \\ & 24 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \mathbf{2 5} \\ 17 \\ \hline \end{array}$ |  | 28 | $\begin{array}{r} 14 \\ 8 \end{array}$ | $\begin{aligned} & 14 \\ & 19 \\ & \hline \end{aligned}$ | $\begin{array}{r} 16 \\ 8 \end{array}$ |  | 36 | $7$ | $\begin{array}{\|l} 17 \\ 13 \\ \hline \end{array}$ | $\begin{array}{\|l} 12 \\ 51 \\ \hline \end{array}$ |  | 42 | $\begin{array}{r} 42 \\ 6 \end{array}$ | $\begin{array}{r} 58 \\ 8 \end{array}$ | $\begin{aligned} & 41 \\ & \mathbf{2 5} \end{aligned}$ | 23 |
| 24 |  | 9 | $\begin{aligned} & 35 \\ & 10 \end{aligned}$ | $\begin{array}{\|r\|} \hline 8 \\ 28 \end{array}$ | $\begin{aligned} & 38 \\ & 10 \end{aligned}$ |  | 19 | $\begin{array}{r} \mathbf{3 1} \\ 9 \\ \hline \end{array}$ | $\begin{aligned} & 22 \\ & 23 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 42 \\ 11 \end{array}$ |  | 28 | $\begin{array}{r} 22 \\ 8 \end{array}$ | $\begin{aligned} & 33 \\ & 18 \end{aligned}$ | $\begin{array}{r} 24 \\ 3 \end{array}$ |  | 36 | $\begin{aligned} & \hline 8 \\ & 7 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \mathbf{3 1} \\ 12 \end{array}$ | $\begin{array}{r} 3 \\ 45 \end{array}$ |  | 42 | $\begin{array}{r} 49 \\ 6 \end{array}$ | 7 | 6 20 | 24 |
| 25 |  | 9 | $\begin{aligned} & 45 \\ & 10 \end{aligned}$ | $\begin{array}{\|l} \hline 36 \\ 27 \\ \hline \end{array}$ | $\begin{array}{r} 48 \\ 5 \\ \hline \end{array}$ |  | 19 | $\begin{array}{r} 40 \\ 9 \\ \hline \end{array}$ | $\begin{aligned} & 45 \\ & 22 \end{aligned}$ | $\begin{array}{r} 53 \\ \hline 7 \\ \hline \end{array}$ |  | 28 | $\begin{array}{r} 30 \\ 8 \end{array}$ | $\begin{aligned} & 51 \\ & 16 \end{aligned}$ | $\begin{array}{\|} 27 \\ 58 \\ \hline \end{array}$ |  | 36 | $\begin{array}{r} 15 \\ 7 \\ \hline \end{array}$ | $\begin{aligned} & 43 \\ & 11 \end{aligned}$ | $\begin{aligned} & \hline 4^{8} \\ & 40 \\ & \hline \end{aligned}$ |  | 42 | $\begin{array}{r} 55 \\ 6 \end{array}$ | $\begin{array}{r} 14 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 26 \\ 15 \\ \hline \end{array}$ | 25 |
| 26 |  | 9 | $\begin{array}{\|l\|} \hline 56 \\ 10 \\ \hline \end{array}$ | $\begin{array}{r} 3 \\ 26 \\ \hline \end{array}$ | $\begin{array}{r} 53 \\ 0 \end{array}$ |  | 19 | $\begin{array}{r} 50 \\ 9 \\ \hline \end{array}$ | $\begin{array}{\|r\|} \hline 8 \\ 21 \end{array}$ | $0$ |  | 28 | $\begin{array}{r} 39 \\ \hline \end{array}$ | $\begin{array}{r} 8 \\ 15 \\ \hline \end{array}$ | $\begin{array}{\|l} \mathbf{2 5} \\ 53 \\ \hline \end{array}$ |  | 36 | $\begin{array}{r} \mathbf{2 2} \\ 7 \\ \hline \end{array}$ | $\begin{array}{\|l} 55 \\ 10 \end{array}$ | $\begin{aligned} & 28 \\ & 35 \\ & \hline \end{aligned}$ |  | 43 | 1 6 | $\begin{array}{r} 20 \\ \hline \\ \hline \end{array}$ | $\begin{array}{r} 41 \\ \hline 9 \\ \hline \end{array}$ | 26 |
| 27 |  | 10 | $\begin{array}{r} 6 \\ 10 \\ \hline \end{array}$ | $\begin{aligned} & 29 \\ & 24 \\ & \hline \end{aligned}$ | $\begin{aligned} & 53 \\ & 55 \\ & \hline \end{aligned}$ |  | 19 | $\begin{array}{r} 59 \\ 9 \\ \hline \end{array}$ | $\begin{aligned} & 29 \\ & 19 \\ & \hline \end{aligned}$ | $\begin{array}{\|r} \mathbf{1} \\ 57 \\ \hline \end{array}$ |  | 28 | $\begin{array}{r} 47 \\ 8 \end{array}$ | $\begin{array}{\|l} 24 \\ 14 \\ \hline \end{array}$ | $\begin{aligned} & 18 \\ & 47 \end{aligned}$ |  | 36 | $\begin{array}{r} 30 \\ \hline 7 \\ \hline \end{array}$ | 6 | $\begin{array}{r} 3 \\ 29 \\ \hline \end{array}$ |  | 43 | 7 6 | $\begin{array}{r} 25 \\ 4 \\ \hline \end{array}$ | $\begin{gathered} \mathbf{5 0} \\ 3 \\ \hline \end{gathered}$ | 27 |
| 28 |  | 10 | $\begin{aligned} & 16 \\ & 10 \end{aligned}$ | $\begin{array}{\|l\|} \hline 54 \\ 23 \\ \hline \end{array}$ | $\begin{aligned} & 48 \\ & 50 \end{aligned}$ |  | 20 | $\begin{aligned} & \hline 8 \\ & 9 \\ & \hline \end{aligned}$ | $\begin{aligned} & 48 \\ & 18 \end{aligned}$ | $\begin{aligned} & 58 \\ & 51 \\ & \hline \end{aligned}$ |  | 28 | $\begin{array}{r} 55 \\ 8 \end{array}$ | $\begin{aligned} & 39 \\ & 13 \end{aligned}$ | $\begin{array}{r} 5 \\ 4^{2} \\ \hline \end{array}$ |  | 36 | $\begin{array}{r} 37 \\ \hline 7 \\ \hline \end{array}$ | $\begin{array}{r} 15 \\ \hline 8 \end{array}$ | $\begin{aligned} & 3^{2} \\ & 24 \end{aligned}$ |  | 43 | $\begin{array}{\|r} 13 \\ 6 \end{array}$ | $\begin{array}{r} 29 \\ 2 \end{array}$ | $\begin{array}{\|l} 53 \\ 58 \\ \hline \end{array}$ | 28 |
| 29 |  | 10 | $\begin{array}{\|l\|} 27 \\ 10 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 18 \\ 22 \end{array}$ | $\begin{array}{\|l\|} \hline 38 \\ 46 \\ \hline \end{array}$ |  | 20 | $\begin{array}{r} 18 \\ 9 \\ \hline \end{array}$ | $\begin{array}{\|r} 7 \\ 17 \\ \hline \end{array}$ | $\begin{array}{\|l} 49 \\ 46 \\ \hline \end{array}$ |  | 29 | $\begin{aligned} & 3 \\ & 8 \end{aligned}$ | $\left\lvert\, \begin{aligned} & 52 \\ & 12 \end{aligned}\right.$ | $\begin{array}{\|l} 47 \\ 37 \\ \hline \end{array}$ |  | 36 | $\begin{array}{r} 44 \\ \hline \end{array}$ | $\begin{array}{r} 23 \\ \hline 7 \end{array}$ | $\begin{aligned} & 56 \\ & 19 \end{aligned}$ |  | 43 | $\begin{array}{r} 19 \\ 6 \end{array}$ | $\begin{array}{r} 32 \\ 1 \end{array}$ | $\begin{array}{\|l} \mathbf{5 1} \\ 53 \\ \hline \end{array}$ | 29 |
| 30 | 59 | 10 | $\begin{aligned} & 37 \\ & 10 \end{aligned}$ | $\begin{aligned} & \hline 41 \\ & 21 \end{aligned}$ | $\begin{aligned} & 24 \\ & 40 \\ & \hline \end{aligned}$ | 59 | 20 | $\begin{array}{r} 27 \\ 9 \\ \hline \end{array}$ | $\begin{aligned} & 25 \\ & 16 \end{aligned}$ | $\begin{aligned} & 35 \\ & 42 \\ & \hline \end{aligned}$ | 59 | 29 | $\begin{array}{\|r} 12 \\ 8 \end{array}$ | $\begin{array}{r} 5 \\ 11 \end{array}$ | $\begin{aligned} & 24 \\ & 32 \\ & \hline \end{aligned}$ | 59 | 36 | $\begin{array}{r} \mathbf{5 1} \\ 7 \\ \hline \end{array}$ | $\begin{array}{r} 31 \\ \hline \end{array}$ | $\begin{aligned} & 15 \\ & 13 \end{aligned}$ | 59 | 43 | $\begin{array}{r} 25 \\ \hline \end{array}$ | $\begin{array}{r} 34 \\ 0 \end{array}$ | $\begin{array}{\|l\|} \hline 44 \\ 47 \\ \hline \end{array}$ | 30 |

Bürgi's 1' sine table (reconstruction, D. Roegel, 2016)

| , | $80^{\circ}$ |  |  |  |  | $81^{\circ}$ |  |  |  |  | $82^{\circ}$ |  |  |  |  | $83^{\circ}$ |  |  |  |  | $84^{\circ}$ |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 30 | 59 | 10 | $\begin{array}{\|l\|} \hline 37 \\ 10 \end{array}$ | $\begin{array}{\|l\|} \hline 41 \\ 21 \end{array}$ | $\begin{array}{\|l\|} \hline 24 \\ 40 \\ \hline \end{array}$ | 59 | 20 | $\begin{array}{r} 27 \\ 9 \end{array}$ | $\begin{aligned} & 25 \\ & 16 \end{aligned}$ | $\begin{aligned} & 35 \\ & 42 \end{aligned}$ | 59 | 29 | $\begin{array}{r} 12 \\ 8 \end{array}$ | $\begin{array}{r} 5 \\ 11 \end{array}$ | $\begin{aligned} & 24 \\ & 32 \end{aligned}$ | 59 | $3^{6}$ | $\begin{array}{\|r} \hline \mathbf{5 1} \\ 7 \end{array}$ | $\begin{array}{r} \mathbf{3 1} \\ 6 \end{array}$ | $\begin{aligned} & 15 \\ & 13 \end{aligned}$ | 59 | 43 | $\begin{array}{r} 25 \\ 6 \end{array}$ | $\begin{gathered} 34 \\ 0 \end{gathered}$ | $\begin{aligned} & 44 \\ & 47 \\ & \hline \end{aligned}$ | 30 |
| 31 |  | 10 | $\begin{array}{\|l\|} \hline 48 \\ 10 \end{array}$ | $\begin{array}{r} 3 \\ 20 \end{array}$ | $\begin{array}{r} 4 \\ 3^{6} \\ \hline \end{array}$ |  | 20 | $\begin{array}{r} 36 \\ \hline 9 \\ \hline \end{array}$ | $\begin{array}{\|l} 42 \\ 15 \end{array}$ | $\begin{aligned} & \mathbf{1 7} \\ & 36 \\ & \hline \end{aligned}$ |  | 29 | $\begin{array}{r} 20 \\ 8 \end{array}$ | $\begin{aligned} & 16 \\ & 10 \end{aligned}$ | $\begin{aligned} & 56 \\ & 26 \end{aligned}$ |  | $3^{6}$ | $\begin{array}{r} 5^{8} \\ 7 \\ \hline \end{array}$ | $\begin{array}{r} 37 \\ 5 \\ \hline \end{array}$ | $\begin{array}{r} 28 \\ \hline 8 \end{array}$ |  | 43 | $\begin{array}{\|r} \hline \mathbf{3 1} \\ 5 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 35 \\ 59 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 31 \\ 41 \\ \hline \end{array}$ | 31 |
| 32 |  | 10 | $\begin{array}{\|l\|} \hline 58 \\ 10 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 23 \\ 19 \\ \hline \end{array}$ | $\begin{aligned} & 40 \\ & 30 \\ & \hline \end{aligned}$ |  | 20 | $\begin{array}{r} 45 \\ \hline \end{array}$ | $\begin{aligned} & 57 \\ & 14 \end{aligned}$ | $\begin{aligned} & 53 \\ & 3^{1} \\ & \hline \end{aligned}$ |  | 29 | $\begin{array}{r} 28 \\ 8 \\ \hline \end{array}$ | $\begin{array}{r} 27 \\ \hline 9 \\ \hline \end{array}$ | $\begin{aligned} & 22 \\ & 22 \end{aligned}$ |  | 37 | $\begin{aligned} & \mathbf{5} \\ & 7 \\ & \hline \end{aligned}$ | $\begin{array}{r} 42 \\ 4 \end{array}$ | $\begin{array}{r} 36 \\ 3 \\ \hline \end{array}$ |  | 43 | $\begin{array}{r} 37 \\ \hline \end{array}$ | $\begin{aligned} & 35 \\ & 58 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 12 \\ 37 \\ \hline \end{array}$ | $3^{2}$ |
| 33 |  | 11 | $\begin{array}{\|r\|} \hline 8 \\ 10 \end{array}$ | $\begin{array}{\|l\|} \hline 43 \\ 18 \end{array}$ | $\begin{aligned} & 10 \\ & 26 \end{aligned}$ |  | 20 | $\begin{array}{r} 55 \\ 9 \end{array}$ | $\begin{array}{\|l} 12 \\ 13 \\ \hline \end{array}$ | $\begin{aligned} & 24 \\ & 26 \end{aligned}$ |  | 29 | $\begin{array}{r} 36 \\ 8 \end{array}$ | $\begin{array}{r} 36 \\ 8 \end{array}$ | $\begin{aligned} & 44 \\ & 16 \end{aligned}$ |  | 37 | $\begin{array}{r} 12 \\ 7 \end{array}$ | $\begin{array}{r} 46 \\ 2 \end{array}$ | $\begin{array}{\|l} \hline 39 \\ 57 \\ \hline \end{array}$ |  | 43 | $\begin{array}{r} 43 \\ 5 \\ \hline \end{array}$ | $\begin{array}{\|l} 33 \\ 57 \\ \hline \end{array}$ | $\begin{array}{\|l} 49 \\ 30 \end{array}$ | 33 |
| 34 |  | 11 | $\begin{aligned} & 19 \\ & 10 \\ & \hline \end{aligned}$ | $17$ | $\begin{array}{\|l\|} \hline 36 \\ 21 \\ \hline \end{array}$ |  | 21 | $\begin{aligned} & 4 \\ & 9 \\ & \hline \end{aligned}$ | $\begin{aligned} & 25 \\ & 12 \end{aligned}$ | $\begin{aligned} & 50 \\ & 20 \end{aligned}$ |  | 29 | $\begin{array}{r} 44 \\ 8 \end{array}$ | $\begin{array}{r} 45 \\ \hline \end{array}$ | $\begin{gathered} 0 \\ 10 \end{gathered}$ |  | 37 | $\begin{array}{\|r} 19 \\ 7 \\ \hline \end{array}$ | $\begin{array}{\|c} 49 \\ 1 \end{array}$ | $\begin{array}{\|l} \hline 36 \\ 52 \\ \hline \end{array}$ |  | 43 | $\begin{array}{r} 49 \\ 5 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline \mathbf{3 1} \\ 56 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 19 \\ 25 \\ \hline \end{array}$ | 34 |
| 35 |  | 11 | $\begin{array}{\|l\|} \hline 29 \\ 10 \\ \hline \end{array}$ | $\begin{aligned} & \hline 18 \\ & 16 \end{aligned}$ | $\begin{array}{\|l\|} \hline 57 \\ 16 \\ \hline \end{array}$ |  | 21 | $\begin{array}{r} 13 \\ 9 \\ \hline \end{array}$ | $\begin{aligned} & 38 \\ & 11 \end{aligned}$ | $\begin{aligned} & 10 \\ & 16 \end{aligned}$ |  | 29 | $\begin{array}{r} 52 \\ 8 \end{array}$ | $\begin{array}{r} 52 \\ 6 \end{array}$ | $\begin{array}{r} 10 \\ \hline 6 \\ \hline \end{array}$ |  | 37 | $\begin{array}{r} 26 \\ \hline \\ \hline \end{array}$ | $\begin{gathered} 51 \\ 0 \end{gathered}$ | $\begin{array}{\|l} \hline 28 \\ 46 \\ \hline \end{array}$ |  | 43 | $\begin{array}{r} 55 \\ 5 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{2 7} \\ & 55 \\ & \hline \end{aligned}$ | $\begin{aligned} & 44 \\ & 20 \end{aligned}$ | 35 |
| 36 |  | 11 | $\begin{array}{\|l\|} \hline 39 \\ 10 \end{array}$ | $\begin{array}{\|l\|} \hline 35 \\ 15 \\ \hline \end{array}$ | $\begin{aligned} & 13 \\ & 11 \\ & \hline \end{aligned}$ |  | 21 | $\begin{array}{r} 22 \\ 9 \end{array}$ | $\begin{aligned} & 49 \\ & 10 \end{aligned}$ | $\begin{aligned} & 26 \\ & 11 \end{aligned}$ |  | 30 | $\begin{aligned} & \mathbf{o} \\ & 8 \end{aligned}$ | $\begin{array}{r} 58 \\ \hline \\ \hline \end{array}$ | $\begin{gathered} 16 \\ 0 \end{gathered}$ |  | 37 | $\begin{array}{r} 33 \\ 6 \end{array}$ | $\begin{aligned} & \mathbf{5 2} \\ & 59 \end{aligned}$ | $\begin{array}{\|l} 14 \\ 41 \\ \hline \end{array}$ |  | 44 | $\begin{aligned} & \mathbf{1} \\ & \mathbf{5} \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 23 \\ 54 \\ \hline \end{array}$ | $\begin{array}{r} 4 \\ 14 \\ \hline \end{array}$ | 36 |
| 37 |  | 11 | $\begin{array}{\|l\|} \hline 49 \\ 10 \end{array}$ | $\begin{aligned} & \hline 50 \\ & 14 \\ & \hline \end{aligned}$ | $\begin{array}{r} 24 \\ 6 \end{array}$ |  | 21 | $\begin{array}{r} \mathbf{3 1} \\ 9 \end{array}$ | $\begin{array}{r} 59 \\ 9 \\ \hline \end{array}$ | $\begin{array}{r} 37 \\ 5 \\ \hline \end{array}$ |  | 30 | $\begin{aligned} & 9 \\ & 8 \end{aligned}$ | $3$ | $\begin{aligned} & \mathbf{1 6} \\ & 55 \end{aligned}$ |  | 37 | $\begin{array}{r} 40 \\ 6 \end{array}$ | $\begin{aligned} & \mathbf{5 1} \\ & 58 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 55 \\ 36 \\ \hline \end{array}$ |  | 44 | $\begin{aligned} & 7 \\ & 5 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline \mathbf{1 7} \\ 53 \end{array}$ | $\begin{array}{r} 18 \\ \hline 8 \end{array}$ | 37 |
| $3^{8}$ |  | 12 | $\begin{array}{\|r\|} \hline 0 \\ 10 \\ \hline \end{array}$ | $\begin{array}{r} 4 \\ 13 \\ \hline \end{array}$ | $\begin{array}{r} 30 \\ 1 \end{array}$ |  | 21 | $\begin{array}{r} 41 \\ \hline 9 \end{array}$ | $\begin{aligned} & \hline 8 \\ & 8 \end{aligned}$ | $\begin{array}{r} 42 \\ 1 \end{array}$ |  | 30 | $\begin{array}{r} 17 \\ 8 \end{array}$ | $\begin{aligned} & 7 \\ & 2 \end{aligned}$ | $\begin{aligned} & 11 \\ & 50 \\ & \hline \end{aligned}$ |  | 37 | $\begin{array}{r} 47 \\ \hline \end{array}$ | $\begin{aligned} & 50 \\ & 57 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline \mathbf{3 1} \\ 30 \\ \hline \end{array}$ |  | 44 | $\begin{array}{r} 13 \\ 5 \end{array}$ | $\begin{array}{\|l} \hline 10 \\ 52 \\ \hline \end{array}$ | $\begin{array}{\|r} 26 \\ 3 \\ \hline \end{array}$ | $3^{8}$ |
| 39 |  | 12 | $\begin{array}{\|l\|} \hline 10 \\ 10 \end{array}$ | $\left\|\begin{array}{l} 17 \\ 11 \end{array}\right\|$ | $\begin{array}{\|l\|} \hline \mathbf{3 1} \\ 56 \\ \hline \end{array}$ |  | 21 | $\begin{array}{r} 50 \\ 9 \end{array}$ | $\begin{array}{r} 16 \\ 6 \end{array}$ | $\begin{aligned} & 43 \\ & 55 \\ & \hline \end{aligned}$ |  | 30 | $\begin{array}{r} 25 \\ 8 \end{array}$ | $\begin{array}{r} 10 \\ 1 \end{array}$ | $\begin{array}{r} 1 \\ 44 \\ \hline \end{array}$ |  | 37 | $\begin{array}{r} 54 \\ \hline \end{array}$ | $\begin{aligned} & 48 \\ & 56 \end{aligned}$ | $\begin{array}{r} \mathbf{1} \\ \mathbf{2 5} \\ \hline \end{array}$ |  | 44 | $\begin{array}{r} 19 \\ 5 \end{array}$ | $\begin{array}{r} 2 \\ 50 \end{array}$ | $\begin{aligned} & 29 \\ & 58 \end{aligned}$ | 39 |
| 40 | 59 | 12 | $\begin{array}{\|l\|} \hline 20 \\ 10 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 29 \\ 10 \end{array}$ | $\begin{aligned} & \mathbf{2 7} \\ & 52 \end{aligned}$ | 59 | 21 | $\begin{array}{r} 59 \\ 9 \end{array}$ | $\begin{array}{r} 23 \\ 5 \\ \hline \end{array}$ | $\begin{aligned} & 38 \\ & 50 \end{aligned}$ | 59 | 30 | $\begin{array}{r} 33 \\ 8 \end{array}$ | $\begin{array}{r} 11 \\ 0 \end{array}$ | $\begin{aligned} & 45 \\ & 40 \\ & \hline \end{aligned}$ | 59 | $3^{8}$ | $\begin{aligned} & 1 \\ & 6 \end{aligned}$ | $\begin{aligned} & 44 \\ & 55 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 26 \\ 19 \\ \hline \end{array}$ | 59 | 44 | $\begin{array}{r} 24 \\ 5 \end{array}$ | $\begin{array}{\|l} 53 \\ 49 \\ \hline \end{array}$ | $\begin{aligned} & 27 \\ & 52 \\ & \hline \end{aligned}$ | 40 |
| 41 |  | 12 | $\begin{array}{\|l\|} \hline 30 \\ 10 \end{array}$ | $\begin{array}{r} 40 \\ 9 \\ \hline \end{array}$ | $\begin{aligned} & 19 \\ & 46 \end{aligned}$ |  | 22 | $\begin{aligned} & 8 \\ & 9 \\ & \hline \end{aligned}$ | $\begin{array}{r} 29 \\ 4 \end{array}$ | $\begin{aligned} & 28 \\ & 46 \end{aligned}$ |  | 30 | $\begin{array}{r} \mathbf{4 1} \\ 7 \end{array}$ | $\begin{array}{\|l} \mathbf{1 2} \\ 59 \\ \hline \end{array}$ | $\begin{array}{\|} 25 \\ 34 \\ \hline \end{array}$ |  | $3^{8}$ | $\begin{aligned} & 8 \\ & 6 \end{aligned}$ | $\begin{aligned} & 39 \\ & 54 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 45 \\ 14 \\ \hline \end{array}$ |  | 44 | $\begin{array}{r} 30 \\ 5 \end{array}$ | $\begin{array}{\|l} 43 \\ 48 \\ \hline \end{array}$ | $\begin{aligned} & 19 \\ & 46 \end{aligned}$ | 41 |
| 42 |  | 12 | $\begin{array}{\|l\|} \hline 40 \\ 10 \end{array}$ | $\begin{array}{\|r\|} \hline 50 \\ 8 \end{array}$ | $\begin{array}{r} 5 \\ 42 \\ \hline \end{array}$ |  | 22 | $\begin{array}{r} 17 \\ 9 \\ \hline \end{array}$ | $\begin{array}{r} 34 \\ \hline \end{array}$ | $\begin{array}{\|l} 14 \\ 40 \\ \hline \end{array}$ |  | 30 | $\begin{array}{r} 49 \\ 7 \end{array}$ | $\begin{array}{\|l\|} \hline 11 \\ 58 \\ \hline \end{array}$ | $\begin{aligned} & 59 \\ & 28 \end{aligned}$ |  | 38 | $\begin{array}{r} 15 \\ 6 \end{array}$ | $\begin{array}{\|l} 33 \\ 53 \\ \hline \end{array}$ | $\begin{array}{r} 59 \\ \hline \\ \hline \end{array}$ |  | 44 | $\begin{array}{r} 36 \\ \hline \\ \hline \end{array}$ | $\begin{aligned} & 32 \\ & 47 \\ & \hline \end{aligned}$ | $\begin{array}{\|r} \hline 5 \\ 41 \\ \hline \end{array}$ | 42 |
| 43 |  | 12 | $\left\lvert\, \begin{aligned} & 50 \\ & 10 \end{aligned}\right.$ | $\begin{array}{\|r\|} \hline 58 \\ 7 \\ \hline \end{array}$ | $\begin{aligned} & 47 \\ & 36 \end{aligned}$ |  | 22 | $\begin{array}{r} 26 \\ 9 \end{array}$ | $\begin{array}{r} 37 \\ 2 \end{array}$ | $\begin{aligned} & 54 \\ & 35 \end{aligned}$ |  | 30 | $\begin{array}{r} 57 \\ 7 \end{array}$ | $\begin{array}{\|l} \mathbf{1 0} \\ 57 \\ \hline \end{array}$ | $\begin{array}{\|l} 27 \\ 24 \end{array}$ |  | $3^{8}$ | $\begin{array}{r} 22 \\ 6 \end{array}$ | $\begin{aligned} & 27 \\ & 52 \end{aligned}$ | $\begin{aligned} & 8 \\ & 3 \end{aligned}$ |  | 44 | $\begin{array}{r} 42 \\ 5 \end{array}$ | $\begin{array}{\|l} 19 \\ 46 \\ \hline \end{array}$ | $\begin{aligned} & 46 \\ & 36 \end{aligned}$ | 43 |
| 44 |  | 13 | $\begin{array}{\|r\|} \hline 1 \\ 10 \end{array}$ | $\begin{aligned} & 6 \\ & 6 \end{aligned}$ | $\begin{aligned} & 23 \\ & 32 \\ & \hline \end{aligned}$ |  | 22 | $\begin{array}{r} 35 \\ 9 \\ \hline \end{array}$ | $\begin{gathered} 40 \\ 1 \end{gathered}$ | $\begin{aligned} & 29 \\ & 29 \\ & \hline \end{aligned}$ |  | 31 | $\begin{aligned} & 5 \\ & 7 \\ & \hline \end{aligned}$ | $\begin{array}{r} 7 \\ 56 \\ \hline \end{array}$ | $\begin{aligned} & 51 \\ & 18 \end{aligned}$ |  | 38 | $\begin{array}{r} 29 \\ 6 \end{array}$ | $\begin{aligned} & 19 \\ & 50 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 11 \\ 58 \\ \hline \end{array}$ |  | 44 | $\begin{array}{r} 48 \\ \hline \end{array}$ | $\begin{array}{r} 6 \\ 45 \\ \hline \end{array}$ | $\begin{aligned} & 22 \\ & 30 \\ & \hline \end{aligned}$ | 44 |
| 45 |  | 13 | $\begin{array}{\|l\|} 11 \\ 10 \\ \hline \end{array}$ | $\begin{array}{r} 12 \\ 5 \\ \hline \end{array}$ | $\begin{aligned} & 55 \\ & 26 \end{aligned}$ |  | 22 | $\begin{array}{r} 44 \\ 9 \\ \hline \end{array}$ | $\begin{gathered} 41 \\ 0 \end{gathered}$ | $\begin{aligned} & 58 \\ & 25 \end{aligned}$ |  | $3^{1}$ | $\begin{array}{r} 13 \\ 7 \\ \hline \end{array}$ | $\begin{array}{r} 4 \\ 55 \\ \hline \end{array}$ | $\begin{array}{r} 9 \\ 13 \\ \hline \end{array}$ |  | $3^{8}$ | $\begin{array}{r} 36 \\ 6 \end{array}$ | $\begin{array}{\|l} \mathbf{1 0} \\ 49 \\ \hline \end{array}$ | $\begin{array}{r} 9 \\ 52 \\ \hline \end{array}$ |  | 44 | $53$ | $\begin{array}{\|l} 5^{1} \\ 44 \\ \hline \end{array}$ | $\begin{array}{\|l} 52 \\ 24 \\ \hline \end{array}$ | 45 |
| 46 |  | 13 | $\begin{aligned} & 21 \\ & 10 \end{aligned}$ | $\begin{array}{r} 18 \\ \hline 4 \end{array}$ | $\begin{aligned} & 21 \\ & 22 \end{aligned}$ |  | 22 | $\begin{array}{r} 53 \\ 8 \end{array}$ | $\begin{aligned} & 42 \\ & 59 \end{aligned}$ | $\left\lvert\, \begin{aligned} & 23 \\ & 20 \end{aligned}\right.$ |  | 31 | $\begin{array}{r} 20 \\ 7 \end{array}$ | $\begin{array}{\|l} 59 \\ 54 \end{array}$ | $\begin{array}{r} 22 \\ 7 \end{array}$ |  | $3^{8}$ | $\begin{array}{r} 43 \\ 6 \end{array}$ | $\begin{array}{r} \mathbf{o} \\ 48 \end{array}$ | $\begin{array}{r} \mathbf{1} \\ 47 \end{array}$ |  | 44 | $\begin{array}{r} 59 \\ 5 \end{array}$ | $\begin{aligned} & 36 \\ & 43 \end{aligned}$ | $\begin{array}{\|l\|} \hline 16 \\ 19 \\ \hline \end{array}$ | 46 |
| 47 |  | 13 | $\begin{aligned} & \hline 31 \\ & 10 \end{aligned}$ | $\begin{array}{r} 22 \\ \hline \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 43 \\ 17 \\ \hline \end{array}$ |  | 23 | $\begin{aligned} & 2 \\ & 8 \end{aligned}$ | $\begin{aligned} & \mathbf{4 1} \\ & 58 \\ & \hline \end{aligned}$ | $\begin{aligned} & 43 \\ & 14 \end{aligned}$ |  | 31 | $\begin{array}{r} 28 \\ 7 \\ \hline \end{array}$ | $\begin{array}{\|l} 53 \\ 53 \\ \hline \end{array}$ | $\begin{array}{r} 29 \\ \hline \\ \hline \end{array}$ |  | 38 | $\begin{array}{r} 49 \\ 6 \end{array}$ | $\begin{aligned} & 48 \\ & 47 \end{aligned}$ | $\begin{array}{\|l} \hline 48 \\ 42 \\ \hline \end{array}$ |  | 45 | $\begin{aligned} & 5 \\ & 5 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 19 \\ 42 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 35 \\ 13 \\ \hline \end{array}$ | 47 |
| 48 |  | 13 | $\begin{array}{\|l\|} \hline \mathbf{4 1} \\ 10 \end{array}$ | $\begin{array}{r} 26 \\ 2 \end{array}$ | $\begin{array}{r} 0 \\ 12 \\ \hline \end{array}$ |  | 23 | $\begin{array}{r} \mathbf{1 1} \\ 8 \end{array}$ | $\begin{aligned} & 39 \\ & 57 \\ & \hline \end{aligned}$ | $\begin{array}{\|r} 57 \\ 9 \\ \hline \end{array}$ |  | 31 | $\begin{array}{r} 3^{6} \\ 7 \end{array}$ | $\begin{aligned} & 46 \\ & 51 \\ & \hline \end{aligned}$ | $\begin{aligned} & \mathbf{3 2} \\ & 57 \end{aligned}$ |  | $3^{8}$ | $\begin{array}{r} 56 \\ 6 \end{array}$ | $\begin{array}{\|l\|} \hline 36 \\ 4^{6} \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 30 \\ 36 \\ \hline \end{array}$ |  | 45 | $\begin{array}{r} 11 \\ 5 \\ \hline \end{array}$ | $\begin{array}{r} 1 \\ 41 \\ \hline \end{array}$ | $\begin{array}{r} 48 \\ 8 \end{array}$ | 48 |
| 49 |  | 13 | $\begin{array}{\|l\|} \hline 51 \\ 10 \end{array}$ | $\begin{array}{r\|} \hline 28 \\ 1 \end{array}$ | $\begin{array}{r} 12 \\ 6 \end{array}$ |  | 23 | $\begin{array}{r} 20 \\ 8 \end{array}$ | $\begin{aligned} & 37 \\ & 56 \end{aligned}$ | $\begin{aligned} & \hline 6 \\ & 5 \end{aligned}$ |  | 31 | $\begin{array}{r} 44 \\ \hline \end{array}$ | $\begin{aligned} & 38 \\ & 50 \end{aligned}$ | $\begin{aligned} & 29 \\ & 52 \end{aligned}$ |  | 39 | $\begin{aligned} & 3 \\ & 6 \end{aligned}$ | $\begin{array}{\|l} 23 \\ 45 \\ \hline \end{array}$ | $\begin{array}{r} 6 \\ 31 \\ \hline \end{array}$ |  | 45 | $\begin{array}{r} 16 \\ \hline 5 \\ \hline \end{array}$ | $\begin{aligned} & 42 \\ & 40 \end{aligned}$ | $\begin{gathered} 56 \\ 3 \end{gathered}$ | 49 |
| 50 | 59 | 14 | $\begin{array}{r} 1 \\ 10 \\ \hline \end{array}$ | $\begin{array}{r} 29 \\ 0 \end{array}$ | $\begin{array}{r} 18 \\ 2 \end{array}$ | 59 | 23 | $\begin{array}{r} 29 \\ 8 \end{array}$ | $\begin{aligned} & 33 \\ & 54 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \mathbf{1 1} \\ 59 \\ \hline \end{array}$ | 59 | 31 | $\begin{array}{r} 52 \\ 7 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline \mathbf{2 9} \\ 49 \\ \hline \end{array}$ | $\begin{aligned} & 21 \\ & 46 \end{aligned}$ | 59 | 39 | $\begin{array}{r} 10 \\ 6 \end{array}$ | $\begin{array}{r} 8 \\ 44 \\ \hline \end{array}$ | $\begin{array}{\|l} 37 \\ 25 \\ \hline \end{array}$ | 59 | 45 | $\begin{array}{r} 22 \\ 5 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 22 \\ 38 \\ \hline \end{array}$ | $\begin{array}{\|l} 59 \\ 56 \\ \hline \end{array}$ | 50 |
| 51 |  | 14 | $\begin{array}{\|r} \mathbf{1 1} \\ 9 \\ \hline \end{array}$ | $\begin{aligned} & 29 \\ & 58 \end{aligned}$ | $\begin{aligned} & \hline 20 \\ & 57 \\ & \hline \end{aligned}$ |  | 23 | $\begin{array}{r} 38 \\ 8 \end{array}$ | $\begin{aligned} & \mathbf{2 8} \\ & 53 \end{aligned}$ | $\begin{array}{\|l} \mathbf{1 0} \\ 54 \\ \hline \end{array}$ |  | 32 | $\begin{aligned} & \mathbf{0} \\ & 7 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 19 \\ 48 \\ \hline \end{array}$ | $\begin{array}{r} 7 \\ 4^{1} \\ \hline \end{array}$ |  | 39 | $\begin{array}{r} 16 \\ 6 \end{array}$ | $\begin{array}{\|l} 53 \\ 43 \end{array}$ | $\begin{array}{r} 2 \\ 20 \end{array}$ |  | 45 | $\begin{array}{r} 28 \\ 5 \end{array}$ | $\begin{array}{\|r} \mathbf{1} \\ 37 \\ \hline \end{array}$ | $\begin{array}{\|l} 55 \\ 52 \end{array}$ | 51 |
| 52 |  | 14 | $\begin{array}{\|r\|} \hline 21 \\ 9 \end{array}$ | $\begin{aligned} & 28 \\ & 57 \\ & \hline \end{aligned}$ | $\begin{array}{l\|} \hline 17 \\ 52 \end{array}$ |  | 23 | $\begin{array}{r} 47 \\ 8 \end{array}$ | $\begin{aligned} & 22 \\ & 52 \\ & \hline \end{aligned}$ | $\begin{array}{r} 4 \\ 49 \\ \hline \end{array}$ |  | 32 | $\begin{aligned} & 8 \\ & 7 \end{aligned}$ | $\begin{array}{r} 7 \\ 47 \\ \hline \end{array}$ | $\begin{aligned} & 48 \\ & 36 \end{aligned}$ |  | 39 | $\begin{array}{r} 23 \\ 6 \end{array}$ | $\begin{aligned} & 36 \\ & 4^{2} \end{aligned}$ | $\begin{array}{\|l} 22 \\ 14 \\ \hline \end{array}$ |  | 45 | $\begin{array}{r} 33 \\ 5 \end{array}$ | $\begin{aligned} & 39 \\ & 36 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 47 \\ 45 \\ \hline \end{array}$ | 52 |
| 53 |  | 14 | $\begin{array}{r} \mathbf{3 1} \\ 9 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 26 \\ 56 \\ \hline \end{array}$ | $\begin{array}{\|r} \hline 9 \\ 47 \\ \hline \end{array}$ |  | 23 | $\begin{array}{r} 56 \\ 8 \end{array}$ | $\begin{array}{\|l} 14 \\ 51 \\ \hline \end{array}$ | $\begin{array}{\|l} 53 \\ 43 \\ \hline \end{array}$ |  | 32 | $\begin{array}{r} 15 \\ 7 \\ \hline \end{array}$ | $\begin{aligned} & 55 \\ & 46 \\ & \hline \end{aligned}$ | $\begin{aligned} & 24 \\ & 31 \\ & \hline \end{aligned}$ |  | 39 | $\begin{array}{r} 30 \\ 6 \end{array}$ | $\begin{aligned} & 18 \\ & 41 \\ & \hline \end{aligned}$ | $\begin{array}{r} 36 \\ \hline 9 \\ \hline \end{array}$ |  | 45 | $\begin{array}{r} 39 \\ \hline \\ \hline \end{array}$ | $\begin{array}{\|l} \hline \mathbf{1 6} \\ 35 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 3^{2} \\ 40 \\ \hline \end{array}$ | 53 |
| 54 |  | 14 | $\begin{array}{r} 41 \\ 9 \end{array}$ | $\begin{aligned} & 22 \\ & 55 \\ & \hline \end{aligned}$ | $\begin{aligned} & 56 \\ & 42 \end{aligned}$ |  | 24 | $\begin{aligned} & 5 \\ & 8 \end{aligned}$ | $\begin{array}{r} 6 \\ 50 \end{array}$ | $\begin{aligned} & \mathbf{3}^{6} \\ & 39 \\ & \hline \end{aligned}$ |  | $3^{2}$ | $\begin{array}{\|r\|} \hline 23 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline \mathbf{4 1} \\ \mathbf{4 5} \\ \hline \end{array}$ | $\begin{aligned} & 55 \\ & 25 \\ & \hline \end{aligned}$ |  | 39 | $\begin{array}{r} 36 \\ 6 \end{array}$ | $\begin{aligned} & 59 \\ & 40 \\ & \hline \end{aligned}$ | $45$ |  | 45 | $\begin{array}{r} 44 \\ 5 \\ \hline \end{array}$ | $\begin{array}{\|l} \mathbf{5 2}^{2} \\ 34 \\ \hline \end{array}$ | $\begin{array}{\|l} 12 \\ 35 \\ \hline \end{array}$ | 54 |
| 55 |  | 14 | $\begin{array}{r} \mathbf{5 1} \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 18 \\ 54 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 38 \\ 37 \\ \hline \end{array}$ |  | 24 | $\begin{array}{r} 13 \\ 8 \end{array}$ | $\begin{aligned} & 57 \\ & 49 \end{aligned}$ | $\begin{aligned} & 15 \\ & 33 \end{aligned}$ |  | 32 | $\begin{array}{r} \mathbf{3 1} \\ 7 \end{array}$ | $\begin{array}{\|l} \hline \mathbf{2 7} \\ 44 \\ \hline \end{array}$ | $\begin{aligned} & 20 \\ & 20 \end{aligned}$ |  | 39 | $\begin{array}{r} 43 \\ 6 \end{array}$ | $\begin{aligned} & 39 \\ & 38 \end{aligned}$ | $\begin{aligned} & 49 \\ & 58 \\ & \hline \end{aligned}$ |  | 45 | $\begin{array}{r} 50 \\ 5 \end{array}$ | $\begin{aligned} & \mathbf{2 6} \\ & 33 \end{aligned}$ | $\begin{aligned} & 47 \\ & 29 \end{aligned}$ | 55 |
| 56 |  | 15 | $\begin{aligned} & \mathbf{1} \\ & 9 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \mathbf{1 3} \\ 53 \\ \hline \end{array}$ | $\begin{aligned} & 15 \\ & 3^{2} \\ & \hline \end{aligned}$ |  | 24 | $\begin{array}{r} 22 \\ 8 \end{array}$ | $\begin{aligned} & 46 \\ & 48 \end{aligned}$ | $\begin{aligned} & 48 \\ & 28 \end{aligned}$ |  | 32 | $\begin{array}{r} 39 \\ 7 \end{array}$ | $\begin{array}{\|l\|} \mathbf{1 1} \\ 43 \end{array}$ | $\begin{array}{\|l} 40 \\ 15 \end{array}$ |  | 39 | $\begin{array}{r} 50 \\ 6 \end{array}$ | $\begin{aligned} & \mathbf{1 8} \\ & \mathbf{3 7} \end{aligned}$ | $\begin{array}{\|} 47 \\ 53 \\ \hline \end{array}$ |  | 45 | $\begin{array}{r} 56 \\ 5 \end{array}$ | $\begin{array}{r} 0 \\ 3^{2} \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 16 \\ 24 \\ \hline \end{array}$ | 56 |
| 57 |  | 15 | $\begin{array}{\|r\|} \hline \mathbf{1 1} \\ 9 \end{array}$ | $\begin{array}{r} 6 \\ 52 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 47 \\ 27 \end{array}$ |  | 24 | $\begin{array}{r} \mathbf{3 1} \\ 8 \end{array}$ | $\begin{aligned} & 35 \\ & 47 \end{aligned}$ | $\begin{aligned} & 16 \\ & 24 \end{aligned}$ |  | 32 | $\begin{array}{r} 46 \\ 7 \end{array}$ | $\begin{array}{\|l} 54 \\ 42 \\ \hline \end{array}$ | $\begin{aligned} & 55 \\ & 10 \end{aligned}$ |  | 39 | $\begin{array}{r} 56 \\ 6 \end{array}$ | $\begin{aligned} & 56 \\ & 36 \end{aligned}$ | $\begin{array}{\|l\|} \hline 40 \\ 47 \\ \hline \end{array}$ |  | 46 | $\begin{aligned} & 1 \\ & 5 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 3^{2} \\ 31 \\ \hline \end{array}$ | $\begin{aligned} & 40 \\ & 18 \end{aligned}$ | 57 |
| 58 |  | 15 | $\begin{array}{\|r\|} \hline 20 \\ 9 \end{array}$ | $\begin{aligned} & \hline 59 \\ & 51 \end{aligned}$ | $\begin{array}{\|l\|} \hline 14 \\ 23 \end{array}$ |  | 24 | $\begin{array}{r} 40 \\ 8 \end{array}$ | $\begin{aligned} & 22 \\ & 46 \end{aligned}$ | $\begin{aligned} & \mathbf{4 0} \\ & \mathbf{1 0} \end{aligned}$ |  | 32 | $\begin{array}{r} 54 \\ 7 \end{array}$ | $\begin{array}{\|l} 37 \\ 41 \\ \hline \end{array}$ | $5$ |  | 40 | $\begin{aligned} & 3 \\ & 6 \end{aligned}$ | $\begin{aligned} & 33 \\ & 35 \end{aligned}$ | $\begin{aligned} & 27 \\ & 42 \end{aligned}$ |  | 46 | $\begin{aligned} & 7 \\ & 5 \\ & \hline \end{aligned}$ | $\begin{array}{r} 3 \\ 30 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 58 \\ 12 \end{array}$ | 58 |
| 59 |  | 15 | $\begin{array}{\|r\|} \hline 30 \\ 9 \end{array}$ | $\begin{aligned} & 50 \\ & 50 \end{aligned}$ | $\begin{array}{\|l\|} \hline 37 \\ 17 \\ \hline \end{array}$ |  | 24 | $\begin{array}{r} 49 \\ 8 \end{array}$ | $\begin{array}{r} 8 \\ 45 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 57 \\ 13 \end{array}$ |  | 33 | 2 | $\begin{aligned} & \hline \mathbf{1 8} \\ & 39 \\ & \hline \end{aligned}$ | $\begin{array}{r} 9 \\ 59 \end{array}$ |  | 40 | $\begin{array}{r} 10 \\ 6 \end{array}$ | $\begin{array}{r} 9 \\ 34 \end{array}$ | $\begin{array}{r} 9 \\ 37 \\ \hline \end{array}$ |  | 46 | $\begin{array}{r} 12 \\ 5 \\ \hline \end{array}$ | $\begin{array}{\|l} 34 \\ 29 \\ \hline \end{array}$ | $\begin{array}{r} 10 \\ 7 \end{array}$ | 59 |
| 60 | 59 | 15 | $\begin{array}{r} \hline 40 \\ 9 \end{array}$ | $\begin{array}{\|l\|} \hline 40 \\ 49 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 54 \\ 12 \end{array}$ | 59 | 24 | $\begin{array}{r} 57 \\ 8 \end{array}$ | $\begin{array}{\|} 54 \\ 44 \\ \hline \end{array}$ | $\begin{array}{r} 10 \\ 8 \end{array}$ | 59 | 33 | $\begin{aligned} & \mathbf{9} \\ & 7 \\ & \hline \end{aligned}$ | $\begin{aligned} & 58 \\ & 38 \\ & \hline \end{aligned}$ | $\begin{array}{r} 8 \\ 53 \\ \hline \end{array}$ | 59 | 40 | $\begin{array}{r} 16 \\ \hline 6 \end{array}$ | $\begin{aligned} & 43 \\ & 33 \end{aligned}$ | $\begin{aligned} & \hline 46 \\ & 3^{1} \\ & \hline \end{aligned}$ | 59 | 46 | $\begin{array}{r} 18 \\ \hline \end{array}$ | $\begin{array}{r} 3 \\ 28 \end{array}$ | $\begin{array}{r} 17 \\ 2 \end{array}$ | 60 |

Bürgi's 1' sine table (reconstruction, D. Roegel, 2016)

| 1 | $85^{\circ}$ |  |  |  |  | $86^{\circ}$ |  |  |  |  | $87^{\circ}$ |  |  |  |  | $88^{\circ}$ |  |  |  |  |  | $89^{\circ}$ |  |  |  |  |  |  | , |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 0 | 59 | 46 | $\begin{array}{\|r\|} \hline 18 \\ 5 \\ \hline \end{array}$ | $\begin{array}{r}3 \\ 28 \\ \hline\end{array}$ | $\begin{array}{r} 17 \\ 2 \end{array}$ | 59 | 51 | $\begin{array}{r} 13 \\ 4 \\ \hline \end{array}$ | $\begin{aligned} & 50 \\ & 22 \end{aligned}$ | $\begin{array}{r} 5 \\ 26 \end{array}$ | 59 | 55 | $\begin{array}{l\|} \hline 3 \\ 3 \end{array}$ | $\begin{aligned} & 58 \\ & 16 \end{aligned}$ | $\begin{aligned} & 46 \\ & 45 \end{aligned}$ | 59 | 57 | $\begin{array}{r} 48 \\ 2 \end{array}$ | $\begin{array}{\|l\|} \hline 25 \\ 11 \end{array}$ | $7$ | $\begin{array}{r} 5 \\ 12 \end{array}$ | 59 | 59 | $\begin{array}{r} 27 \\ 1 \end{array}$ | $\begin{aligned} & \hline 6 \\ & 5 \\ & \hline \end{aligned}$ | $\begin{array}{r} 7 \\ 14 \\ \hline \end{array}$ | $\begin{array}{r} 45 \\ 44 \\ \hline \end{array}$ | $\begin{aligned} & 13 \\ & 51 \end{aligned}$ | 0 |
| 1 |  | 46 | $\begin{array}{r} \hline 23 \\ 5 \\ \hline \end{array}$ | $\begin{aligned} & 31 \\ & 26 \end{aligned}$ | $\begin{array}{\|l\|} \hline 19 \\ 55 \\ \hline \end{array}$ |  | 51 | $\begin{array}{r} 18 \\ 4 \\ \hline \end{array}$ | $\begin{aligned} & 12 \\ & 21 \end{aligned}$ | $\begin{aligned} & \hline 31 \\ & 20 \end{aligned}$ |  | 55 | $\begin{aligned} & \hline 7 \\ & 3 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 15 \\ 15 \\ \hline \end{array}$ | $\begin{aligned} & 3 \mathbf{3 1} \\ & \mathbf{4}^{0} \end{aligned}$ |  | 57 | $\begin{array}{r} 50 \\ 20 \end{array}$ | $\begin{array}{\|c\|} \hline 36 \\ 9 \\ \hline \end{array}$ | $\begin{array}{r} 8 \\ 55 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 17 \\ 27 \\ \hline \end{array}$ |  | 59 | $\begin{array}{\|r} \hline 28 \\ 1 \end{array}$ | $\begin{array}{r} \hline 11 \\ \hline \end{array}$ | $\begin{array}{r} 22 \\ 8 \end{array}$ | $\begin{aligned} & \hline 30 \\ & 57 \\ & \hline \end{aligned}$ | 4 3 | 1 |
| 2 |  | 46 | $\begin{array}{\|r\|} \hline 28 \\ 5 \\ \hline \end{array}$ | $\begin{array}{\|l} 58 \\ 25 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 14 \\ 51 \\ \hline \end{array}$ |  | 51 | $\begin{array}{r} 22 \\ \hline 4 \\ \hline \end{array}$ | $\begin{aligned} & 33 \\ & 20 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 51 \\ 15 \\ \hline \end{array}$ |  | 55 | $\begin{array}{\|r} 10 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 31 \\ 14 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 11 \\ 34 \\ \hline \end{array}$ |  | 57 | $\begin{array}{r} 5^{2} \\ 2 \end{array}$ | $\begin{gathered} 46 \\ 8 \end{gathered}$ | $\begin{array}{r} 3 \\ 49 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 44 \\ 41 \\ \hline \end{array}$ |  | 59 | $\begin{array}{r} 29 \\ 1 \end{array}$ | $\begin{array}{\|r\|} \hline 15 \\ \hline \end{array}$ | $\begin{array}{r} \mathbf{3 1} \\ 3 \\ \hline \end{array}$ | $\begin{aligned} & \hline 27 \\ & 10 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 40 \\ 19 \\ \hline \end{array}$ | 2 |
| 3 |  | 46 | $\begin{array}{\|r\|} 34 \\ 5 \\ \hline \end{array}$ | $\begin{aligned} & 24 \\ & 24 \end{aligned}$ | $\begin{array}{r} 5 \\ 45 \end{array}$ |  | 51 | $\begin{array}{r} 26 \\ 4 \end{array}$ | $\begin{aligned} & 54 \\ & 19 \end{aligned}$ | $\begin{aligned} & 6 \\ & 9 \\ & \hline \end{aligned}$ |  | 55 | $\begin{array}{r} 13 \\ 3 \\ \hline \end{array}$ | $\begin{array}{\|l} 45 \\ 13 \end{array}$ | $\begin{aligned} & 45 \\ & 28 \end{aligned}$ |  | 57 | $\begin{array}{r} 54 \\ 2 \end{array}$ | $\begin{array}{r} 54 \\ 7 \\ \hline \end{array}$ | $\begin{array}{\|l} 53 \\ 43 \\ \hline \end{array}$ | $\begin{aligned} & 25 \\ & 56 \\ & \hline \end{aligned}$ |  | 59 | $\left[\begin{array}{c} 30 \\ 1 \end{array}\right.$ | $\begin{array}{r} 18 \\ 1 \end{array}$ | $\begin{aligned} & 34 \\ & 57 \end{aligned}$ | $\begin{aligned} & 37 \\ & 23 \\ & \hline \end{aligned}$ | $\begin{array}{r} 59 \\ 1 \end{array}$ | 3 |
| 4 |  | 46 | $\begin{array}{\|r\|} \hline 39 \\ 5 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 48 \\ 23 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{5 0} \\ & 39 \\ & \hline \end{aligned}$ |  | 51 | $\begin{array}{r} 31 \\ \hline 4 \\ \hline \end{array}$ | $\begin{aligned} & 13 \\ & 18 \\ & \hline \end{aligned}$ | $\begin{array}{\|r\|} \hline 15 \\ \hline \end{array}$ |  | 55 | $\begin{array}{r} 16 \\ 3 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 59 \\ 12 \\ \hline \end{array}$ | $\begin{aligned} & 13 \\ & 22 \end{aligned}$ |  | 57 | $\begin{array}{r} 57 \\ 2 \end{array}$ | $\begin{aligned} & \hline 2 \\ & 6 \end{aligned}$ | $\begin{array}{\|l} \hline 37 \\ 38 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 21 \\ 10 \\ \hline \end{array}$ |  | 59 | $3_{1}^{1}$ | $\begin{array}{\|r\|} \hline 20 \\ 0 \\ \hline \end{array}$ | $\begin{aligned} & 32 \\ & 51 \\ & \hline \end{aligned}$ | $\begin{array}{r} \mathbf{1} \\ 35 \\ \hline \end{array}$ | $\begin{array}{r} \hline 0 \\ 42 \\ \hline \end{array}$ | 4 |
| 5 |  | 46 | $\begin{array}{r} 45 \\ \hline \end{array}$ | $\begin{aligned} & 12 \\ & 22 \end{aligned}$ | $\begin{aligned} & 29 \\ & 33 \\ & \hline \end{aligned}$ |  | 51 | $\begin{array}{r} 35 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{3 1} \\ & 16 \end{aligned}$ | $\begin{aligned} & 18 \\ & 57 \\ & \hline \end{aligned}$ |  | 55 | $\begin{array}{r} 20 \\ 3 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 11 \\ 11 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 35 \\ 17 \\ \hline \end{array}$ |  | 57 | $\begin{array}{r} 59 \\ 2 \end{array}$ | $\begin{aligned} & 9 \\ & 5 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 15 \\ 3^{2} \\ \hline \end{array}$ | $\begin{array}{\|l} \hline \mathbf{3 1} \\ 24 \\ \hline \end{array}$ |  | 59 | 32 | $\begin{aligned} & \hline 21 \\ & 59 \\ & \hline \end{aligned}$ | $\begin{aligned} & 23 \\ & 45 \\ & \hline \end{aligned}$ | $\begin{aligned} & \hline 36 \\ & 48 \\ & \hline \end{aligned}$ | $\begin{aligned} & 42 \\ & 22 \end{aligned}$ | 5 |
| 6 |  | 46 | $\begin{array}{\|r\|} \hline 50 \\ 5 \\ \hline \end{array}$ | $\begin{aligned} & 35 \\ & 21 \end{aligned}$ | $\begin{array}{\|r\|} \hline 2 \\ 28 \end{array}$ |  | 51 | $\begin{array}{r} 39 \\ 4 \end{array}$ | $\begin{aligned} & 48 \\ & 15 \\ & \hline \end{aligned}$ | $\begin{aligned} & 15 \\ & 5^{2} \end{aligned}$ |  | 55 | $\begin{array}{\|r\|} \hline 23 \\ \hline \end{array}$ | $\begin{aligned} & 22 \\ & 10 \end{aligned}$ | $\begin{aligned} & \mathbf{5 2}^{2} \\ & \mathbf{1 1} \end{aligned}$ |  | 58 | $1$ | $14$ | $\begin{aligned} & 47 \\ & 26 \\ & \hline \end{aligned}$ | $\begin{aligned} & 55 \\ & 39 \\ & \hline \end{aligned}$ |  | 59 | 33 | $\begin{array}{\|l\|} \hline 21 \\ 58 \\ \hline \end{array}$ | $\begin{array}{r} 9 \\ 40 \\ \hline \end{array}$ | $\begin{array}{r} 25 \\ \hline 1 \\ \hline \end{array}$ | $\begin{aligned} & 4 \\ & 0 \end{aligned}$ | 6 |
| 7 |  | 46 | $\begin{array}{r} 55 \\ \hline 5 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 56 \\ 20 \\ \hline \end{array}$ | $\begin{array}{\|l} 30 \\ 23 \\ \hline \end{array}$ |  | 51 | $\begin{array}{r} 44 \\ 4 \end{array}$ | $\begin{array}{r} 4 \\ 14 \\ \hline \end{array}$ | $\begin{array}{r} 7 \\ 4^{6} \\ \hline \end{array}$ |  | 55 | $\begin{array}{r} 26 \\ \hline \end{array}$ | $33$ | $\begin{aligned} & 3 \\ & 5 \\ & \hline \end{aligned}$ |  | 58 | $\begin{aligned} & 3 \\ & 2 \end{aligned}$ | $\begin{array}{r} 19 \\ 3 \end{array}$ | $\begin{array}{l\|} \hline 14 \\ 20 \end{array}$ | $\begin{array}{\|l} 34 \\ 53 \\ \hline \end{array}$ |  | 59 | 34 | $\begin{array}{\|l\|} \hline 19 \\ 57 \\ \hline \end{array}$ | $\begin{aligned} & 49 \\ & 34 \\ & \hline \end{aligned}$ | $\begin{aligned} & \hline 26 \\ & 13 \end{aligned}$ | $\begin{array}{r} 4 \\ 38 \\ \hline \end{array}$ | 7 |
| 8 |  | 47 | $\begin{aligned} & 1 \\ & 5 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 16 \\ 19 \\ \hline \end{array}$ | $\begin{aligned} & 53 \\ & 17 \\ & \hline \end{aligned}$ |  | 51 | $\begin{array}{r} 48 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 18 \\ 13 \\ \hline \end{array}$ | $\begin{aligned} & 53 \\ & 41 \\ & \hline \end{aligned}$ |  | 55 | $\begin{array}{\|r} 29 \\ 3 \\ \hline \end{array}$ | $\begin{array}{r} 42 \\ 8 \end{array}$ | $8$ |  | 58 | $\begin{aligned} & 5 \\ & 2 \end{aligned}$ | $\begin{array}{r} 22 \\ 2 \end{array}$ | $\begin{array}{\|l\|} \hline 35 \\ 15 \\ \hline \end{array}$ | $\begin{array}{r} 27 \\ \hline 7 \\ \hline \end{array}$ |  | 59 | 35 | $\begin{aligned} & 17 \\ & 56 \\ & \hline \end{aligned}$ | $\begin{aligned} & 23 \\ & 28 \end{aligned}$ | $\begin{aligned} & 39 \\ & 26 \end{aligned}$ | $\begin{aligned} & 42 \\ & 15 \\ & \hline \end{aligned}$ | 8 |
| 9 |  | 47 | $\begin{aligned} & \hline 6 \\ & 5 \\ & \hline \end{aligned}$ | $\begin{aligned} & 36 \\ & 18 \end{aligned}$ | $\begin{array}{\|l\|l\|} \hline 10 \\ 11 \end{array}$ |  | 51 | $\begin{array}{r} 52 \\ 4 \end{array}$ | $\begin{aligned} & 32 \\ & 12 \end{aligned}$ | $\begin{array}{\|l} 34 \\ 35 \\ \hline \end{array}$ |  | 55 | $\begin{array}{r} 32 \\ 3 \end{array}$ | $\begin{array}{r} 50 \\ 6 \end{array}$ | $\begin{array}{r} 8 \\ 54 \\ \hline \end{array}$ |  | 58 | $\begin{aligned} & 7 \\ & 2 \end{aligned}$ | $\left\|\begin{array}{c} 24 \\ 1 \end{array}\right\|$ | $\begin{array}{r} 50 \\ 9 \end{array}$ | $\begin{array}{\|l\|} 34 \\ 21 \end{array}$ |  | 59 | $3^{6}$ | $\begin{array}{\|l\|} \hline 13 \\ 55 \\ \hline \end{array}$ | $\begin{aligned} & 52 \\ & 22 \end{aligned}$ | $\begin{array}{r} 5 \\ 38 \\ \hline \end{array}$ | $\begin{aligned} & 57 \\ & 50 \\ & \hline \end{aligned}$ | 9 |
| 10 | 59 | 47 | $\begin{array}{r\|} \hline \mathbf{1 1} \\ 5 \end{array}$ | $\begin{aligned} & \mathbf{5 4} \\ & 17 \end{aligned}$ | $\begin{array}{r} 21 \\ 6 \end{array}$ | 59 | 51 | $\begin{array}{r} 56 \\ 4 \end{array}$ | $\begin{aligned} & 45 \\ & 11 \end{aligned}$ | $\begin{array}{r} 9 \\ 29 \\ \hline \end{array}$ | 59 | 55 | $\begin{array}{r} 35 \\ 3 \end{array}$ | $\begin{array}{r} 57 \\ 5 \end{array}$ | $\begin{array}{r} 2 \\ 48 \\ \hline \end{array}$ | 59 | 58 | $9$ | $\begin{array}{r} 25 \\ 0 \end{array}$ | $\begin{array}{r} 59 \\ 3 \\ \hline \end{array}$ | $\begin{aligned} & 55 \\ & 36 \\ & \hline \end{aligned}$ | 59 | 59 | 37 | $\begin{array}{r} 9 \\ 54 \\ \hline \end{array}$ | $\begin{aligned} & 14 \\ & 16 \end{aligned}$ | $\begin{aligned} & 44 \\ & 51 \end{aligned}$ | $\begin{array}{\|l} 47 \\ 25 \\ \hline \end{array}$ | 10 |
| 11 |  | 47 | $\begin{array}{\|r\|} \hline 17 \\ 5 \end{array}$ | $\begin{aligned} & \hline 11 \\ & 16 \end{aligned}$ | $\begin{array}{r} 27 \\ 0 \end{array}$ |  | 52 | $\begin{aligned} & \mathbf{0} \\ & 4 \end{aligned}$ | $\begin{aligned} & 56 \\ & 10 \end{aligned}$ | $\begin{aligned} & 38 \\ & 24 \end{aligned}$ |  | 55 | $\begin{array}{r} 39 \\ 3 \end{array}$ | $\begin{array}{r} 2 \\ 4 \\ \hline \end{array}$ | $\begin{aligned} & 50 \\ & 4^{2} \\ & \hline \end{aligned}$ |  | 58 | $\begin{array}{\|r\|} \hline 11 \\ 1 \end{array}$ | $\begin{aligned} & 26 \\ & 58 \end{aligned}$ | $\begin{array}{r} 3 \\ 57 \\ \hline \end{array}$ | $\begin{array}{\|l} \mathbf{3 1} \\ 49 \\ \hline \end{array}$ |  | 59 | $3^{8}$ | $\begin{array}{r} 3 \\ 53 \\ \hline \end{array}$ | $\begin{aligned} & 31 \\ & 11 \end{aligned}$ | $\begin{array}{r} 36 \\ 3 \end{array}$ | $\begin{aligned} & 12 \\ & 59 \end{aligned}$ | 11 |
| 12 |  | 47 | $\begin{array}{\|r\|} \hline 22 \\ 5 \end{array}$ | $\begin{aligned} & 27 \\ & 14 \end{aligned}$ | $\begin{aligned} & \mathbf{2 7} \\ & 55 \end{aligned}$ |  | 52 | $\begin{aligned} & 5 \\ & 4 \end{aligned}$ | $\begin{aligned} & 7 \\ & 9 \\ & \hline \end{aligned}$ | $\begin{array}{r} 2 \\ 18 \end{array}$ |  | 55 | $\begin{array}{r} 42 \\ 3 \end{array}$ | $\begin{aligned} & 7 \\ & 3 \end{aligned}$ | $\begin{aligned} & \mathbf{3 2} \\ & 37 \end{aligned}$ |  | 58 | $\left\|\begin{array}{r} 13 \\ 1 \end{array}\right\|$ | $\begin{aligned} & 25 \\ & 57 \end{aligned}$ | $\begin{array}{r} 1 \\ 5^{2} \\ \hline \end{array}$ | $\begin{array}{r} 20 \\ 4 \end{array}$ |  | 59 | $3^{8}$ | $\begin{aligned} & 56 \\ & 52 \\ & 52 \end{aligned}$ | $\begin{array}{r} 42 \\ 5 \\ \hline \end{array}$ | $\begin{aligned} & 40 \\ & 16 \end{aligned}$ | $\begin{aligned} & 11 \\ & 31 \\ & \hline \end{aligned}$ | 12 |
| 13 |  | 47 | $\begin{array}{r} 27 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline \mathbf{4 2} \\ 13 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{2 2} \\ & 49 \end{aligned}$ |  | 52 | $\begin{aligned} & 9 \\ & 4 \\ & \hline \end{aligned}$ | $\begin{array}{r} 16 \\ 8 \end{array}$ | $\begin{aligned} & 20 \\ & 12 \end{aligned}$ |  | 55 | $\begin{array}{\|r} 45 \\ 3 \\ \hline \end{array}$ | $\begin{array}{r} 11 \\ 2 \end{array}$ | $\begin{array}{r} 9 \\ 31 \\ \hline \end{array}$ |  | 58 | $15$ | $\begin{aligned} & 22 \\ & 56 \end{aligned}$ | $\begin{array}{\|l} \hline 53 \\ 46 \\ \hline \end{array}$ | $\begin{aligned} & 24 \\ & 18 \end{aligned}$ |  | 59 | 39 | $\begin{aligned} & 48 \\ & 50 \\ & \hline \end{aligned}$ | $\begin{aligned} & 47 \\ & 59 \\ & \hline \end{aligned}$ | $\begin{aligned} & 56 \\ & 29 \\ & \hline \end{aligned}$ | $\begin{array}{r} 42 \\ 2 \end{array}$ | 13 |
| 14 |  | 47 | $\begin{array}{\|r\|} \hline 32 \\ 5 \\ \hline \end{array}$ | $\begin{aligned} & 56 \\ & 12 \end{aligned}$ | $\begin{array}{\|l\|} \hline \mathbf{1 1} \\ 44 \\ \hline \end{array}$ |  | 52 | $\begin{array}{r} 13 \\ \hline 4 \\ \hline \end{array}$ | $\begin{array}{r} 24 \\ 7 \\ \hline \end{array}$ | $\begin{array}{r} \hline \mathbf{3 2} \\ 7 \\ \hline \end{array}$ |  | 55 | $\begin{array}{r} 48 \\ \hline \\ \hline \end{array}$ | $\begin{array}{r} 13 \\ 1 \end{array}$ | $\begin{aligned} & 40 \\ & 25 \\ & \hline \end{aligned}$ |  | 58 | $\begin{array}{r} 17 \\ 1 \end{array}$ | $\begin{array}{\|l\|} \hline 19 \\ 55 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 39 \\ 40 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline \mathbf{4 2}^{2} \\ 3^{2} \\ \hline \end{array}$ |  | 59 | 40 | $\begin{array}{\|l} 39 \\ 49 \\ \hline \end{array}$ | $\begin{aligned} & 47 \\ & 53 \\ & \hline \end{aligned}$ | $\begin{aligned} & \hline 25 \\ & 41 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 44 \\ 34 \\ \hline \end{array}$ | 14 |
| 15 |  | 47 | $\begin{array}{\|r\|} \hline 38 \\ 5 \\ \hline \end{array}$ | $\begin{array}{\|r\|} \hline 8 \\ 11 \end{array}$ | $\begin{aligned} & 55 \\ & 38 \\ & \hline \end{aligned}$ |  | 52 | $\begin{array}{r} 17 \\ 4 \\ \hline \end{array}$ | $\begin{array}{r} 31 \\ 6 \end{array}$ | $\begin{array}{r} 39 \\ 1 \end{array}$ |  | 55 | $\begin{array}{\|r} \mathbf{5 1} \\ 3 \end{array}$ | $\begin{array}{r} 15 \\ 0 \end{array}$ | $\begin{array}{r} 5 \\ 20 \end{array}$ |  | 58 | $\begin{array}{r} 19 \\ 1 \end{array}$ | $\begin{array}{\|l} 15 \\ 54 \\ \hline \end{array}$ | $\begin{array}{\|} 20 \\ 34 \\ \hline \end{array}$ | $\begin{array}{\|l} 14 \\ 46 \\ \hline \end{array}$ |  | 59 | 41 | $\begin{aligned} & 29 \\ & 48 \\ & \hline \end{aligned}$ | $\begin{aligned} & 41 \\ & 47 \\ & \hline \end{aligned}$ | $\begin{array}{r} 7 \\ 54 \\ \hline \end{array}$ | $\begin{array}{r} 18 \\ \hline \end{array}$ | 15 |
| 16 |  | 47 | $\begin{array}{\|r\|} \hline 43 \\ 5 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 20 \\ 10 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 33 \\ 32 \\ \hline \end{array}$ |  | 52 | $\begin{array}{r} \hline 21 \\ \hline \end{array}$ | $\begin{array}{r} 37 \\ \hline \end{array}$ | $\begin{aligned} & 40 \\ & 55 \\ & \hline \end{aligned}$ |  | 55 | $\begin{array}{r} 54 \\ 2 \end{array}$ | $\begin{array}{\|l\|} \hline \mathbf{1 5} \\ 59 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 25 \\ 14 \\ \hline \end{array}$ |  | 58 | $\begin{array}{r} 21 \\ 1 \end{array}$ | $\begin{array}{\|r} 9 \\ 53 \\ \hline \end{array}$ | $\begin{array}{\|l} 55 \\ 29 \\ \hline \end{array}$ | $\overline{0}$ |  | 59 | 42 | $\begin{array}{\|l\|} \hline \mathbf{1 8} \\ 47 \\ \hline \end{array}$ | $\begin{aligned} & 29 \\ & 4^{2} \\ & \hline \end{aligned}$ | $\begin{aligned} & \hline 1 \\ & 6 \\ & \hline \end{aligned}$ | $\begin{aligned} & 21 \\ & 32 \\ & \hline \end{aligned}$ | 16 |
| 17 |  | 47 | $\begin{array}{\|r\|} \hline 48 \\ 5 \\ \hline \end{array}$ | $\begin{array}{\|r} \hline \mathbf{3 1} \\ \hline \end{array}$ | $\begin{array}{r} 5 \\ 27 \\ \hline \end{array}$ |  | 52 | $\begin{array}{r} 25 \\ 4 \\ \hline \end{array}$ | $\begin{array}{r} \hline \mathbf{4 2} \\ \hline \end{array}$ | $\begin{aligned} & 35 \\ & 50 \end{aligned}$ |  | 55 | $\begin{array}{r} 57 \\ 2 \end{array}$ | $\begin{array}{\|l\|} \hline 14 \\ 58 \\ \hline \end{array}$ | $\begin{array}{r} 39 \\ \hline 8 \end{array}$ |  | 58 | $\begin{array}{r} 23 \\ 1 \end{array}$ | $\begin{array}{r} 3 \\ 5^{2} \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 24 \\ 23 \\ \hline \end{array}$ | $\begin{array}{\|r} \hline 0 \\ 14 \\ \hline \end{array}$ |  | 59 | 43 | $\begin{array}{r} 6 \\ 46 \\ \hline \end{array}$ | $\begin{aligned} & \hline 11 \\ & 3^{6} \\ & \hline \end{aligned}$ | $\begin{array}{r} 7 \\ 19 \\ \hline \end{array}$ | $\begin{gathered} 53 \\ 0 \end{gathered}$ | 17 |
| 18 |  | 47 | $\begin{array}{r} 53 \\ \hline \end{array}$ | $\begin{array}{r} 40 \\ \hline 8 \\ \hline \end{array}$ | $\begin{aligned} & 32 \\ & 21 \end{aligned}$ |  | 52 | $\begin{array}{r} 29 \\ \hline \end{array}$ | $\begin{array}{r} 46 \\ 2 \end{array}$ | $\begin{aligned} & 25 \\ & 44 \\ & \hline \end{aligned}$ |  | 56 | $\begin{aligned} & \mathbf{0} \\ & 2 \end{aligned}$ | $\begin{array}{\|l\|} \hline 12 \\ 57 \\ \hline \end{array}$ | $\begin{array}{r} 47 \\ 2 \end{array}$ |  | 58 | $\begin{array}{r} 24 \\ 1 \end{array}$ | $\begin{aligned} & 55 \\ & 51 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 47 \\ 17 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 14 \\ 27 \\ \hline \end{array}$ |  | 59 | 43 | $\begin{array}{\|l\|} \hline \mathbf{5 2} \\ 45 \\ \hline \end{array}$ | $\begin{aligned} & 47 \\ & 30 \\ & \hline \end{aligned}$ | $\begin{aligned} & \hline 26 \\ & 31 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 53 \\ 27 \\ \hline \end{array}$ | 18 |
| 19 |  | 47 | $\begin{array}{\|r\|} \hline 58 \\ 5 \\ \hline \end{array}$ | $\begin{array}{r} 48 \\ \hline \end{array}$ | $\begin{aligned} & 53 \\ & 16 \end{aligned}$ |  | 52 | $\begin{array}{r} 33 \\ 4 \end{array}$ | $\begin{array}{r} 49 \\ 1 \end{array}$ | $\begin{array}{r} 9 \\ 3^{8} \\ \hline \end{array}$ |  | 56 | $\begin{aligned} & 3 \\ & 2 \end{aligned}$ | $\begin{array}{r} 9 \\ 55 \\ \hline \end{array}$ | $\begin{aligned} & 49 \\ & 57 \end{aligned}$ |  | 58 | $\begin{array}{r} 26 \\ 1 \end{array}$ | $\begin{aligned} & 47 \\ & 50 \\ & \hline \end{aligned}$ | $\begin{array}{r} 4 \\ 11 \end{array}$ | $\begin{aligned} & \hline \mathbf{4 1} \\ & 4^{2} \end{aligned}$ |  | 59 | 44 | $\begin{aligned} & \hline 38 \\ & 44 \\ & \hline \end{aligned}$ | $\begin{aligned} & 17 \\ & 24 \\ & \hline \end{aligned}$ | $\begin{aligned} & 58 \\ & 43 \\ & \hline \end{aligned}$ | $\begin{aligned} & 20 \\ & 53 \end{aligned}$ | 19 |
| 20 | 59 | 48 | $\begin{aligned} & 3 \\ & 5 \\ & \hline \end{aligned}$ | $\begin{array}{r} 56 \\ 6 \end{array}$ | $\begin{array}{r} 9 \\ 10 \end{array}$ | 59 | 52 | $\begin{array}{r} 37 \\ 4 \\ \hline \end{array}$ | $\begin{gathered} 50 \\ 0 \end{gathered}$ | $\begin{aligned} & 47 \\ & 33 \\ & \hline \end{aligned}$ | 59 | 56 | $\begin{aligned} & 6 \\ & 2 \end{aligned}$ | $\begin{array}{r} 5 \\ 54 \\ \hline \end{array}$ | $\begin{aligned} & 46 \\ & 51 \end{aligned}$ | 59 | 58 | $\begin{array}{r} 28 \\ 1 \end{array}$ | $\begin{array}{\|l} 37 \\ 49 \\ \hline \end{array}$ | $\begin{array}{r} 16 \\ \hline 5 \\ \hline \end{array}$ | $\begin{array}{\|} 23 \\ 55 \\ \hline \end{array}$ | 59 | 59 | 45 | $\begin{aligned} & \mathbf{2 2} \\ & 43 \\ & \hline \end{aligned}$ | $\begin{aligned} & 42 \\ & 18 \end{aligned}$ | $\begin{aligned} & 42 \\ & 56 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 13 \\ 19 \\ \hline \end{array}$ | 20 |
| 21 |  | 48 | $\begin{aligned} & 9 \\ & 5 \\ & \hline \end{aligned}$ | $\begin{aligned} & 2 \\ & 5 \\ & \hline \end{aligned}$ | $\begin{array}{r} 19 \\ 5 \end{array}$ |  | 52 | $\begin{array}{\|r} \mathbf{4 1} \\ 3 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{5 1} \\ & 59 \end{aligned}$ | $\begin{aligned} & 20 \\ & 27 \\ & \hline \end{aligned}$ |  | 56 | $\begin{aligned} & 9 \\ & 2 \end{aligned}$ | $\begin{array}{r} \mathbf{0} \\ 53 \\ \hline \end{array}$ | $\begin{array}{\|l} 37 \\ 45 \\ \hline \end{array}$ |  | 58 | $\begin{gathered} 30 \\ 1 \end{gathered}$ | $\begin{aligned} & 26 \\ & 48 \\ & \hline \end{aligned}$ | $\begin{array}{r} 22 \\ 0 \end{array}$ | $\begin{aligned} & 18 \\ & 10 \end{aligned}$ |  | 59 | 46 | $\begin{array}{r} 6 \\ 42 \\ \hline \end{array}$ | $\begin{array}{r} \mathbf{1} \\ \mathbf{1} 3 \\ \hline \end{array}$ | $\begin{array}{r} 38 \\ 8 \end{array}$ | $\begin{array}{\|l} \mathbf{3 2} \\ 44 \\ \hline \end{array}$ | 21 |
| 22 |  | 48 | $\begin{array}{r} 14 \\ 5 \\ \hline \end{array}$ | $\begin{aligned} & 7 \\ & 3 \end{aligned}$ | $\begin{array}{\|l} \mathbf{2 4} \\ 59 \\ \hline \end{array}$ |  | 52 | $\begin{array}{r} 45 \\ 3 \end{array}$ | $\begin{aligned} & 50 \\ & 58 \end{aligned}$ | $\begin{array}{\|l} 47 \\ 21 \end{array}$ |  | 56 | $\begin{array}{r} 11 \\ 2 \end{array}$ | $\begin{array}{\|l} \mathbf{5 4} \\ 52 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{2 2} \\ & 39 \\ & \hline \end{aligned}$ |  | 58 | $\begin{array}{r} 32 \\ 1 \end{array}$ | $\begin{array}{\|l\|} \hline 14 \\ 46 \end{array}$ | $\begin{array}{\|} \mathbf{2 2} \\ 54 \\ \hline \end{array}$ | $\begin{aligned} & 28 \\ & 23 \end{aligned}$ |  | 59 | 46 | $\begin{aligned} & 4^{8} \\ & 41 \\ & \hline \end{aligned}$ | $\begin{array}{r} 14 \\ 7 \end{array}$ | $\begin{aligned} & 47 \\ & 21 \end{aligned}$ | $\begin{array}{r} 16 \\ 8 \end{array}$ | 22 |
| 23 |  | 48 | $\begin{array}{r} 19 \\ 5 \end{array}$ | $\begin{array}{r} 11 \\ 2 \end{array}$ | $\begin{array}{\|l\|} \hline 23 \\ 53 \\ \hline \end{array}$ |  | 52 | $\begin{array}{r} 49 \\ 3 \end{array}$ | $\begin{aligned} & 49 \\ & 57 \end{aligned}$ | $\begin{array}{r} 8 \\ 16 \end{array}$ |  | 56 | $\begin{array}{r} 14 \\ 2 \end{array}$ | $\begin{array}{\|l} 47 \\ 51 \end{array}$ | $\begin{array}{r} \mathbf{1} \\ 34 \\ \hline \end{array}$ |  | 58 | $\begin{array}{r} 34 \\ 1 \end{array}$ | $\begin{array}{r} \mathbf{1} \\ 45 \\ \hline \end{array}$ | $\begin{aligned} & 16 \\ & 48 \end{aligned}$ | $\begin{array}{\|l} 51 \\ 36 \\ \hline \end{array}$ |  | 59 | 47 | $\begin{aligned} & 29 \\ & 40 \end{aligned}$ | $\begin{array}{r} 22 \\ 1 \\ \hline \end{array}$ | $\begin{array}{r} 8 \\ 33 \\ \hline \end{array}$ | $\begin{array}{\|l} 24 \\ 31 \\ \hline \end{array}$ | 23 |
| 24 |  | 48 | $\begin{array}{\|r\|} \hline 24 \\ 5 \end{array}$ | $\begin{array}{r} 14 \\ 1 \end{array}$ | $\begin{aligned} & 16 \\ & 48 \end{aligned}$ |  | 52 | $\begin{array}{r} 53 \\ 3 \end{array}$ | $\begin{aligned} & 46 \\ & 56 \end{aligned}$ | $\begin{aligned} & 24 \\ & 10 \end{aligned}$ |  | 56 | $\begin{array}{r} 17 \\ 2 \end{array}$ | $\begin{aligned} & 38 \\ & 50 \end{aligned}$ | $\begin{aligned} & 35 \\ & 28 \end{aligned}$ |  | 58 | $\begin{array}{r} 35 \\ 1 \end{array}$ | $\begin{aligned} & 47 \\ & 44 \end{aligned}$ | $\begin{array}{r} 5 \\ 42 \\ \hline \end{array}$ | $\begin{aligned} & 27 \\ & 51 \\ & \hline \end{aligned}$ |  | 59 | 48 | $\begin{array}{r} 9 \\ 38 \\ \hline \end{array}$ | $\begin{aligned} & 23 \\ & 55 \end{aligned}$ | $\begin{aligned} & \mathbf{4 1} \\ & 45 \end{aligned}$ | $\begin{aligned} & 55 \\ & 54 \end{aligned}$ | 24 |
| 25 |  | 48 | $\begin{array}{\|r\|} \hline 29 \\ 5 \end{array}$ | $\begin{gathered} 16 \\ 0 \end{gathered}$ | $\begin{array}{r} 4 \\ 42 \end{array}$ |  | 52 | $\begin{array}{r} 57 \\ 3 \end{array}$ | $\begin{aligned} & \mathbf{4 2} \\ & 55 \end{aligned}$ | $\begin{array}{r} 34 \\ 4 \end{array}$ |  | 56 | $\begin{array}{r} 20 \\ 2 \end{array}$ | $\begin{array}{\|l} \hline 29 \\ 49 \\ \hline \end{array}$ | $\begin{array}{r} 3 \\ 22 \end{array}$ |  | 58 | $\begin{array}{r} 37 \\ 1 \end{array}$ | $\begin{aligned} & \hline \mathbf{3 1} \\ & 43 \end{aligned}$ | $\begin{aligned} & 48 \\ & 37 \\ & \hline \end{aligned}$ | $\begin{array}{r} 18 \\ \hline \end{array}$ |  | 59 | 48 | $\begin{aligned} & 48 \\ & 37 \\ & \hline \end{aligned}$ | $\begin{aligned} & 19 \\ & 49 \end{aligned}$ | $\begin{aligned} & 27 \\ & 58 \end{aligned}$ | $\begin{aligned} & 49 \\ & 15 \\ & \hline \end{aligned}$ | 25 |
| 26 |  | 48 | $\begin{array}{r} \hline 34 \\ 4 \\ \hline \end{array}$ | $\begin{aligned} & \hline 16 \\ & 59 \\ & \hline \end{aligned}$ | $\begin{aligned} & 46 \\ & 36 \end{aligned}$ |  | 53 | $\begin{aligned} & \mathbf{1} \\ & 3 \\ & \hline \end{aligned}$ | $\begin{aligned} & 37 \\ & 53 \end{aligned}$ | $\begin{aligned} & 38 \\ & 59 \\ & \hline \end{aligned}$ |  | 56 | $\begin{array}{r} 23 \\ 2 \end{array}$ | $\begin{aligned} & 18 \\ & 48 \end{aligned}$ | $\begin{array}{\|l\|} \hline 25 \\ 17 \end{array}$ |  | 58 | $\begin{array}{r} 39 \\ 1 \end{array}$ | $15$ | $\begin{aligned} & 25 \\ & 31 \end{aligned}$ | $\begin{array}{\|l} 22 \\ 17 \end{array}$ |  | 59 | 49 | $\begin{aligned} & 26 \\ & 36 \end{aligned}$ | $\begin{array}{r} 9 \\ 44 \\ \hline \end{array}$ | $\begin{aligned} & 26 \\ & 10 \end{aligned}$ | ${ }_{3}^{4}$ | 26 |
| 27 |  | 48 | $\begin{array}{r} 39 \\ 4 \end{array}$ | $\begin{array}{\|l\|} \hline 16 \\ 58 \\ \hline \end{array}$ | $\begin{aligned} & 22 \\ & 31 \end{aligned}$ |  | 53 | $\begin{aligned} & 5 \\ & 3 \\ & \hline \end{aligned}$ | $\begin{aligned} & \mathbf{3 1} \\ & 52 \end{aligned}$ | $\begin{aligned} & 37 \\ & 53 \end{aligned}$ |  | 56 | $\begin{array}{r} 26 \\ 2 \end{array}$ | $\begin{array}{r} 6 \\ 47 \end{array}$ | $\begin{aligned} & \mathbf{4 2} \\ & \mathbf{1 1} \end{aligned}$ |  | 58 | $\left[\begin{array}{c} 40 \\ 1 \end{array}\right.$ | $\begin{array}{\|l} 57 \\ 41 \\ \hline \end{array}$ | $\begin{aligned} & 56 \\ & 25 \\ & \hline \end{aligned}$ | $\begin{aligned} & 39 \\ & 32 \end{aligned}$ |  | 59 | 50 | 2 2 | $\begin{aligned} & 53 \\ & 38 \\ & \hline \end{aligned}$ | $\begin{aligned} & 36 \\ & 22 \end{aligned}$ | $\begin{aligned} & 40 \\ & 57 \end{aligned}$ | 27 |
| 28 |  | 48 | $\begin{array}{\|r\|} \hline 44 \\ 4 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline \mathbf{1 4} \\ 57 \\ \hline \end{array}$ | $\begin{aligned} & 53 \\ & 26 \end{aligned}$ |  | 53 | $\begin{aligned} & 9 \\ & 3 \end{aligned}$ | $\begin{aligned} & 24 \\ & 51 \end{aligned}$ | $\begin{aligned} & 30 \\ & 48 \end{aligned}$ |  | 56 | $\begin{array}{r} 28 \\ 2 \end{array}$ | $\begin{aligned} & 53 \\ & 46 \end{aligned}$ | $\begin{array}{r} 53 \\ 5 \end{array}$ |  | 58 | $\begin{array}{r} 42 \\ 1 \end{array}$ | $\begin{aligned} & 39 \\ & 40 \end{aligned}$ | $\begin{array}{\|l\|} \hline 22 \\ 19 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline \mathbf{1 1} \\ 45 \end{array}$ |  | 59 | 50 | $\begin{aligned} & 38 \\ & 34 \end{aligned}$ | $\begin{aligned} & 31 \\ & 32 \end{aligned}$ | $\begin{aligned} & 59 \\ & 35 \end{aligned}$ | $\begin{aligned} & 37 \\ & 16 \end{aligned}$ | 28 |
| 29 |  | 48 | $\begin{array}{r} 49 \\ 4 \\ \hline \end{array}$ | $\begin{aligned} & 12 \\ & 56 \\ & \hline \end{aligned}$ | $\begin{aligned} & 19 \\ & 20 \end{aligned}$ |  | 53 | $\begin{array}{r} 13 \\ 3 \\ \hline \end{array}$ | $\begin{aligned} & 16 \\ & 50 \end{aligned}$ | $\begin{array}{\|l\|} \hline 18 \\ 41 \end{array}$ |  | 56 | $\begin{array}{r} 31 \\ 2 \end{array}$ | $\begin{array}{\|l} 39 \\ 44 \end{array}$ | $\begin{aligned} & 58 \\ & 59 \end{aligned}$ |  | $5^{8}$ | $\begin{array}{\|r} 44 \\ 1 \end{array}$ | $\begin{aligned} & \mathbf{1 9} \\ & 39 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 41 \\ 13 \end{array}$ | $\begin{aligned} & 56 \\ & 58 \end{aligned}$ |  | 59 | 51 | $\begin{aligned} & 13 \\ & 33 \\ & \hline \end{aligned}$ | $\begin{array}{r} 4 \\ 26 \end{array}$ | $\begin{aligned} & 34 \\ & 47 \\ & \hline \end{aligned}$ | $\begin{aligned} & 53 \\ & 36 \end{aligned}$ | 29 |
| 30 | 59 | $4^{8}$ | $\begin{array}{r} 54 \\ 4 \end{array}$ | $\begin{array}{r} 8 \\ 55 \\ \hline \end{array}$ | $\begin{aligned} & 39 \\ & 14 \end{aligned}$ | 59 | 53 | $\begin{array}{r} 17 \\ 3 \end{array}$ | $\begin{array}{r} 6 \\ 49 \end{array}$ | $\begin{aligned} & 59 \\ & 36 \end{aligned}$ | 59 | 56 | $\begin{array}{r} 34 \\ 2 \end{array}$ | $\begin{array}{\|l\|} \hline \mathbf{2 4} \\ 43 \\ \hline \end{array}$ | $\begin{array}{\|l} 57 \\ 54 \\ \hline \end{array}$ | 59 | 58 | $45$ | $\begin{aligned} & 58 \\ & 3^{8} \end{aligned}$ | $\begin{array}{r} 55 \\ 8 \end{array}$ | $\begin{array}{\|l\|} \hline 54 \\ 12 \end{array}$ | 59 | 59 | 51 | $\begin{aligned} & 46 \\ & 32 \end{aligned}$ | $\begin{aligned} & 31 \\ & 20 \end{aligned}$ | $\begin{aligned} & \mathbf{2 2} \\ & 59 \\ & \hline \end{aligned}$ | $\begin{aligned} & 29 \\ & 54 \end{aligned}$ | 30 |

Bürgi's 1' sine table (reconstruction, D. Roegel, 2016)

| ' | $85^{\circ}$ |  |  |  |  | $86^{\circ}$ |  |  |  |  | $87^{\circ}$ |  |  |  |  | $88^{\circ}$ |  |  |  |  |  | $89^{\circ}$ |  |  |  |  |  |  | , |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 30 | 59 | 48 | $\begin{array}{\|r\|} \hline 54 \\ 4 \end{array}$ | $\begin{array}{\|r\|} \hline 8 \\ 55 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 39 \\ 14 \\ \hline \end{array}$ | 59 | 53 | $17$ | $\begin{array}{r} 6 \\ 49 \\ \hline \end{array}$ | $\begin{aligned} & 59 \\ & 36 \end{aligned}$ | 59 | 56 | $34$ | $\begin{array}{\|l\|} \hline 24 \\ 43 \\ \hline \end{array}$ | $\begin{array}{\|l} \mathbf{5 7} \\ 54 \\ \hline \end{array}$ | 59 | 58 | $\begin{array}{r} 45 \\ 1 \end{array}$ | $\begin{aligned} & 58 \\ & 3^{8} \end{aligned}$ | $\begin{array}{r} 55 \\ 8 \end{array}$ | $\begin{array}{\|l\|} 54 \\ 12 \end{array}$ | 59 | 59 | 51 | $\begin{aligned} & 46 \\ & 32 \end{aligned}$ | $\begin{array}{\|l\|} \hline \mathbf{3 1} \\ 20 \end{array}$ | $\begin{aligned} & \mathbf{2 2} \\ & 59 \\ & \hline \end{aligned}$ | $\begin{aligned} & 29 \\ & 54 \\ & \hline \end{aligned}$ | 30 |
| 31 |  | 48 | $\begin{array}{\|r\|} \hline 59 \\ 4 \\ \hline \end{array}$ | $\begin{array}{r} 3 \\ 54 \\ \hline \end{array}$ | $\begin{array}{\|r} 53 \\ 9 \end{array}$ |  | 53 | $\begin{array}{r} 20 \\ 3 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 56 \\ 48 \\ \hline \end{array}$ | $\begin{aligned} & 35 \\ & 3^{1} \end{aligned}$ |  | 56 | $\begin{array}{r} 37 \\ 2 \end{array}$ | $\begin{array}{r} 8 \\ 42 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline \mathbf{5 1} \\ 48 \\ \hline \end{array}$ |  | 58 | $\begin{array}{r} 47 \\ 1 \end{array}$ | $\begin{array}{\|l} 37 \\ 37 \\ \hline \end{array}$ | $\begin{aligned} & 4 \\ & 2 \end{aligned}$ | $\begin{array}{r} \mathbf{6} \\ 25 \\ \hline \end{array}$ |  | 59 | 52 | $\begin{aligned} & 18 \\ & 31 \end{aligned}$ | $\begin{aligned} & 5^{2} \\ & 15 \end{aligned}$ | $\begin{aligned} & 22 \\ & 12 \end{aligned}$ | $\begin{array}{\|l} 23 \\ 12 \end{array}$ | 31 |
| 32 |  | 49 | $\begin{aligned} & \hline 3 \\ & 4 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 58 \\ 53 \\ \hline \end{array}$ | $\begin{aligned} & 2 \\ & 3 \\ & \hline \end{aligned}$ |  | 53 | $\begin{array}{r} 24 \\ \hline \end{array}$ | $\begin{aligned} & 45 \\ & 47 \end{aligned}$ | $\begin{array}{r} 6 \\ 24 \end{array}$ |  | 56 | $\begin{array}{r} 39 \\ 29 \end{array}$ | $\begin{array}{\|l\|} \hline 51 \\ 41 \\ \hline \end{array}$ | $\begin{aligned} & 39 \\ & 4^{2} \\ & \hline \end{aligned}$ |  | 58 | $\begin{array}{r} 49 \\ 1 \end{array}$ | $\begin{aligned} & 14 \\ & 35 \\ & \hline \end{aligned}$ | $\begin{array}{\|r} \hline 6 \\ 56 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline \mathbf{3 1} \\ 39 \\ \hline \end{array}$ |  | 59 | 52 | $\begin{aligned} & \hline 50 \\ & 30 \\ & \hline \end{aligned}$ | $\begin{aligned} & 7 \\ & 9 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 34 \\ 24 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 35 \\ 30 \\ \hline \end{array}$ | $3^{2}$ |
| 33 |  | 49 | $\begin{aligned} & \hline 8 \\ & 4 \\ & \hline \end{aligned}$ | $\begin{aligned} & \mathbf{5 1} \\ & 51 \\ & \hline \end{aligned}$ | $\begin{array}{\|r} 5 \\ 57 \\ \hline \end{array}$ |  | 53 | $\begin{array}{r} 28 \\ 3 \end{array}$ | $\begin{aligned} & 32 \\ & 46 \\ & \hline \end{aligned}$ | $\begin{aligned} & 30 \\ & 19 \end{aligned}$ |  | 56 | $\begin{array}{r} 42 \\ 2 \end{array}$ | $\begin{aligned} & 33 \\ & 40 \end{aligned}$ | $\begin{aligned} & \mathbf{2 1} \\ & 36 \end{aligned}$ |  | 58 | $\begin{gathered} 50 \\ 1 \end{gathered}$ | $\begin{aligned} & 50 \\ & 34 \end{aligned}$ | $\begin{array}{\|r} 3 \\ 50 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{1 0} \\ & 53 \\ & \hline \end{aligned}$ |  | 59 | 53 | $\begin{aligned} & 20 \\ & 29 \end{aligned}$ | $\begin{array}{r} 16 \\ 3 \end{array}$ | $\begin{aligned} & 59 \\ & 36 \end{aligned}$ | $\begin{array}{r} 5 \\ 4^{6} \\ \hline \end{array}$ | 33 |
| 34 |  | 49 | $\begin{array}{\|r\|} \hline 13 \\ \hline \end{array}$ | $\begin{aligned} & 43 \\ & 50 \\ & \hline \end{aligned}$ | $\begin{array}{r} 2 \\ 52 \\ \hline \end{array}$ |  | 53 | $\begin{array}{\|r} 32 \\ 3 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{1 8} \\ & \mathbf{4 5} \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 49 \\ 14 \end{array}$ |  | 56 | $\begin{array}{r} 45 \\ 2 \end{array}$ | $\begin{array}{\|l} \mathbf{1 3} \\ \mathbf{3 9} \\ \hline \end{array}$ | $\begin{aligned} & 57 \\ & 31 \\ & \hline \end{aligned}$ |  | 58 | $\begin{array}{r} 52 \\ 1 \end{array}$ | $\begin{array}{\|l} 24 \\ 33 \\ \hline \end{array}$ | $\begin{array}{\|l} 54 \\ 45 \\ \hline \end{array}$ | $\begin{aligned} & 3 \\ & 5 \\ & \hline \end{aligned}$ |  | 59 | 53 | $\begin{aligned} & 49 \\ & 27 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 20 \\ 57 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 35 \\ 49 \\ \hline \end{array}$ | $\begin{array}{r} 51 \\ 2 \end{array}$ | 34 |
| 35 |  | 49 | $\begin{array}{r} \hline 18 \\ \hline 4 \\ \hline \end{array}$ | $\begin{aligned} & 33 \\ & 49 \\ & \hline \end{aligned}$ | $\begin{aligned} & 54 \\ & 46 \\ & \hline \end{aligned}$ |  | 53 | $\begin{array}{r} 36 \\ 3 \end{array}$ | $\begin{array}{r} 4 \\ 44 \\ \hline \end{array}$ | $\begin{aligned} & 3 \\ & 7 \\ & \hline \end{aligned}$ |  | 56 | $\begin{array}{r} 47 \\ 2 \end{array}$ | $\begin{array}{\|l\|} \hline 53 \\ 38 \end{array}$ | $\begin{aligned} & 28 \\ & 25 \\ & \hline \end{aligned}$ |  | 58 | $\begin{array}{r} 53 \\ 1 \end{array}$ | $\begin{aligned} & 5^{8} \\ & 3^{2} \end{aligned}$ | $\begin{array}{\|l\|} \hline 39 \\ 39 \end{array}$ | $\begin{array}{r} 8 \\ 19 \\ \hline \end{array}$ |  | 59 | 54 | $\begin{array}{\|l} \hline 17 \\ 26 \end{array}$ | $\begin{aligned} & 18 \\ & 52 \end{aligned}$ | $24$ | $\begin{array}{\|l\|} \hline 53 \\ 18 \end{array}$ | 35 |
| 36 |  | 49 | $\begin{array}{r} 23 \\ \hline 4 \\ \hline \end{array}$ | $\begin{aligned} & 23 \\ & 48 \\ & \hline \end{aligned}$ | $\begin{aligned} & 40 \\ & 41 \end{aligned}$ |  | 53 | $\begin{array}{r} 39 \\ 3 \end{array}$ | $\begin{aligned} & 48 \\ & 43 \end{aligned}$ | $\begin{array}{r} 10 \\ 2 \end{array}$ |  | 56 | $\begin{array}{r} 50 \\ 20 \end{array}$ | $\begin{array}{\|l\|} \hline \mathbf{3 1} \\ 37 \\ \hline \end{array}$ | $\begin{array}{\|l} 53 \\ 19 \\ \hline \end{array}$ |  | 58 | $\begin{gathered} 55 \\ 1 \end{gathered}$ | $\begin{aligned} & \hline 3^{1} \\ & 3^{1} \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline \mathbf{1 8} \\ 33 \\ \hline \end{array}$ | $\begin{array}{\|l} 27 \\ 33 \\ \hline \end{array}$ |  | 59 | 54 | $\begin{aligned} & 44 \\ & 25 \\ & \hline \end{aligned}$ | $\begin{aligned} & 10 \\ & 46 \\ & \hline \end{aligned}$ | $\begin{aligned} & \hline 26 \\ & 13 \end{aligned}$ | $\begin{array}{\|l\|} \hline 11 \\ 34 \\ \hline \end{array}$ | 36 |
| 37 |  | 49 | $\begin{array}{r} \hline 28 \\ 4 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 12 \\ 47 \\ \hline \end{array}$ | $\begin{aligned} & 21 \\ & 35 \\ & \hline \end{aligned}$ |  | 53 | $\begin{array}{r} 43 \\ 3 \end{array}$ | $\begin{array}{\|l} \hline 31 \\ \mathbf{4}^{1} \\ \hline \end{array}$ | $\begin{aligned} & 12 \\ & 56 \\ & \hline \end{aligned}$ |  | 56 | $\begin{array}{r} 53 \\ 2 \end{array}$ | $\begin{array}{r} 9 \\ 3^{6} \\ \hline \end{array}$ | $\begin{aligned} & 12 \\ & 13 \\ & \hline \end{aligned}$ |  | 58 | $\begin{array}{r} 57 \\ 1 \end{array}$ | $\begin{array}{r} 2 \\ 30 \end{array}$ | $\begin{aligned} & \mathbf{5 2} \\ & \mathbf{2 7} \\ & \hline \end{aligned}$ | $\begin{array}{r} \hline \mathbf{0} \\ 45 \\ \hline \end{array}$ |  | 59 | 55 | $\begin{array}{r} 9 \\ 24 \\ \hline \end{array}$ | $\begin{aligned} & 56 \\ & 40 \end{aligned}$ | $\begin{array}{\|l} 39 \\ 25 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 45 \\ 48 \\ \hline \end{array}$ | 37 |
| $3^{8}$ |  | 49 | $\begin{array}{r} \hline 32 \\ 4 \\ \hline \end{array}$ | $\begin{aligned} & \hline 59 \\ & 46 \\ & \hline \end{aligned}$ | $\begin{aligned} & 56 \\ & 29 \\ & \hline \end{aligned}$ |  | 53 | $\begin{array}{r} 47 \\ \hline \end{array}$ | $\begin{aligned} & 13 \\ & 40 \\ & \hline \end{aligned}$ | $\begin{array}{r} 8 \\ 51 \\ \hline \end{array}$ |  | 56 | $\begin{array}{r} 55 \\ 2 \end{array}$ | $\begin{aligned} & 45 \\ & 35 \\ & \hline \end{aligned}$ | $\begin{array}{r} 25 \\ \hline 8 \\ \hline \end{array}$ |  | 58 | $\begin{gathered} 58 \\ 1 \end{gathered}$ | $\begin{aligned} & 33 \\ & 29 \end{aligned}$ | $\begin{array}{\|l\|} \hline 19 \\ 21 \end{array}$ | $\begin{array}{\|l\|} \hline 45 \\ 59 \\ \hline \end{array}$ |  | 59 | 55 | $\begin{array}{\|l\|} \hline 34 \\ 23 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 37 \\ 34 \\ \hline \end{array}$ | $\begin{array}{r} 5 \\ 3^{8} \\ \hline \end{array}$ | $\begin{array}{\|r} 33 \\ \hline \end{array}$ | $3^{8}$ |
| 39 |  | 49 | $\begin{array}{r} \hline 37 \\ 4 \\ \hline \end{array}$ | $\begin{aligned} & \hline 46 \\ & 45 \end{aligned}$ | $\begin{array}{\|l\|} \hline 25 \\ 24 \\ \hline \end{array}$ |  | 53 | $\begin{array}{r} 50 \\ 3 \end{array}$ | $\begin{array}{\|l} 53 \\ 39 \end{array}$ | $\begin{aligned} & 59 \\ & 45 \end{aligned}$ |  | 56 | $\begin{array}{r} 58 \\ 2 \end{array}$ | $\begin{aligned} & 20 \\ & 34 \\ & \hline \end{aligned}$ | $\begin{array}{r} 33 \\ 2 \end{array}$ |  | 59 | $\begin{aligned} & 0 \\ & 1 \\ & 1 \end{aligned}$ | $\begin{array}{r} 2 \\ 28 \\ \hline \end{array}$ | $\begin{aligned} & 41 \\ & 16 \end{aligned}$ | $\begin{aligned} & 44 \\ & 12 \end{aligned}$ |  | 59 | 55 | $\begin{aligned} & 58 \\ & 22 \end{aligned}$ | $\begin{array}{\|l\|} \mathbf{1 1} \\ \mathbf{2 8} \end{array}$ | $\begin{aligned} & 43 \\ & 50 \end{aligned}$ | $\begin{aligned} & 36 \\ & 16 \end{aligned}$ | 39 |
| 40 | 59 | 49 | $\begin{array}{r} \hline 42 \\ 4 \\ \hline \end{array}$ | $\begin{aligned} & \hline \mathbf{3 1} \\ & 44 \end{aligned}$ | $\begin{array}{\|l\|} \hline 49 \\ 18 \end{array}$ | 59 | 53 | $\begin{array}{r} 54 \\ 3 \end{array}$ | $\begin{aligned} & 33 \\ & 38 \end{aligned}$ | $\begin{aligned} & 44 \\ & 39 \end{aligned}$ | 59 | 57 | $\begin{aligned} & \hline 0 \\ & 2 \end{aligned}$ | $\begin{array}{\|l\|} \hline 54 \\ 3^{2} \\ \hline \end{array}$ | $\begin{aligned} & 35 \\ & 56 \end{aligned}$ | 59 | 59 | $\mathbf{1}$ | $\begin{aligned} & 30 \\ & 27 \end{aligned}$ | $\begin{aligned} & 57 \\ & 10 \end{aligned}$ | $\begin{aligned} & 56 \\ & 26 \end{aligned}$ | 59 | 59 | 56 | $\begin{aligned} & 20 \\ & 21 \end{aligned}$ | $\begin{aligned} & 40 \\ & 23 \\ & \hline \end{aligned}$ | $33$ | $\begin{aligned} & \mathbf{5 2} \\ & 31 \\ & \hline \end{aligned}$ | 40 |
| 41 |  | 49 | $\begin{array}{\|r\|} \hline 47 \\ \hline \end{array}$ | $\begin{aligned} & 16 \\ & 43 \\ & \hline \end{aligned}$ | $\begin{array}{r} 7 \\ 13 \\ \hline \end{array}$ |  | 53 | $\begin{array}{r} 58 \\ 3 \end{array}$ | $\begin{array}{\|l} 12 \\ 37 \\ \hline \end{array}$ | $\begin{aligned} & 23 \\ & 34 \end{aligned}$ |  | 57 | $\begin{aligned} & 3 \\ & 2 \end{aligned}$ | $\begin{aligned} & 27 \\ & 31 \\ & \hline \end{aligned}$ | $\begin{aligned} & \mathbf{3 1} \\ & 51 \end{aligned}$ |  | 59 | $2$ | $\begin{aligned} & 58 \\ & 26 \end{aligned}$ | $\begin{aligned} & \hline 8 \\ & 4 \\ & \hline \end{aligned}$ | $\begin{aligned} & \mathbf{2 2} \\ & 39 \\ & \hline \end{aligned}$ |  | 59 | 56 | $\begin{aligned} & 42 \\ & 20 \end{aligned}$ | $\begin{array}{\|r} 3 \\ 17 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 3^{6} \\ 14 \\ \hline \end{array}$ | $\begin{array}{\|l} 23 \\ 43 \end{array}$ | 41 |
| 42 |  | 49 | $\begin{array}{r} \hline 5 \mathbf{1} \\ 4 \\ \hline \end{array}$ | $\begin{aligned} & \hline 59 \\ & 42 \\ & \hline \end{aligned}$ | $\begin{array}{\|r\|} \hline 20 \\ 7 \\ \hline \end{array}$ |  | 54 | $\begin{aligned} & 1 \\ & 3 \\ & \hline \end{aligned}$ | $\begin{aligned} & 49 \\ & 36 \end{aligned}$ | $\begin{array}{\|l} 57 \\ 27 \\ \hline \end{array}$ |  | 57 | $\begin{aligned} & 5 \\ & 2 \end{aligned}$ | $\begin{array}{\|l\|} \hline 59 \\ 30 \\ \hline \end{array}$ | $\begin{array}{\|l} 22 \\ 44 \\ \hline \end{array}$ |  | 59 | $4$ | $\begin{array}{\|l} 24 \\ 24 \\ \hline \end{array}$ | $\begin{aligned} & 13 \\ & 58 \\ & \hline \end{aligned}$ | $\begin{array}{r} 1 \\ 51 \\ \hline \end{array}$ |  | 59 | 57 | $\begin{array}{r} \mathbf{2} \\ 19 \end{array}$ | $\begin{aligned} & 20 \\ & 11 \end{aligned}$ | $\begin{aligned} & \hline 51 \\ & 26 \end{aligned}$ | $\begin{array}{\|r} \hline 6 \\ 56 \\ \hline \end{array}$ | 42 |
| 43 |  | 49 | $\begin{array}{r} 56 \\ 4 \\ \hline \end{array}$ | $\begin{aligned} & 41 \\ & 41 \end{aligned}$ | $\left.\begin{array}{r} 27 \\ 1 \end{array} \right\rvert\,$ |  | 54 | $\begin{aligned} & 5 \\ & 3 \end{aligned}$ | $\begin{aligned} & \mathbf{2 6} \\ & 35 \end{aligned}$ | $\begin{aligned} & 24 \\ & 23 \end{aligned}$ |  | 57 | $\begin{aligned} & 8 \\ & 2 \end{aligned}$ | $\begin{aligned} & 30 \\ & 29 \\ & \hline \end{aligned}$ | $\begin{array}{r} 6 \\ 39 \\ \hline \end{array}$ |  | 59 | $5$ | $\begin{aligned} & 49 \\ & 23 \end{aligned}$ | $\begin{array}{\|l\|} \mathbf{1 1} \\ 53 \\ \hline \end{array}$ | $\begin{array}{r} 52 \\ 5 \end{array}$ |  | 59 | 57 | $\left\|\begin{array}{l} 21 \\ 18 \end{array}\right\|$ | $\begin{array}{r} 32 \\ 5 \end{array}$ | $\begin{aligned} & \hline \mathbf{1 8} \\ & \mathbf{3 9} \end{aligned}$ | $\begin{aligned} & 2 \\ & 8 \end{aligned}$ | 43 |
| 44 |  | 50 | $\begin{aligned} & 1 \mathbf{1} \\ & 4 \\ & \hline \end{aligned}$ | $\begin{aligned} & 22 \\ & 39 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 28 \\ 56 \\ \hline \end{array}$ |  | 54 | $\begin{aligned} & 9 \\ & 3 \\ & \hline \end{aligned}$ | $\begin{array}{r} \mathbf{1} \\ 34 \\ \hline \end{array}$ | $\begin{array}{\|l} 47 \\ 16 \end{array}$ |  | 57 | $\begin{array}{r} 10 \\ 2 \\ \hline \end{array}$ | $\begin{aligned} & 59 \\ & 28 \\ & \hline \end{aligned}$ | $\begin{aligned} & 45 \\ & 34 \\ & \hline \end{aligned}$ |  | 59 | $\begin{aligned} & 7 \\ & 1 \end{aligned}$ | $\begin{aligned} & 13 \\ & 22 \\ & \hline \end{aligned}$ | $\begin{array}{\|r\|} \hline 4 \\ 47 \\ \hline \end{array}$ | $\begin{array}{\|l} 57 \\ 18 \end{array}$ |  | 59 | 57 | $\begin{aligned} & 39 \\ & 16 \end{aligned}$ | $\begin{array}{\|l} \hline 37 \\ 59 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 57 \\ 51 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 10 \\ 20 \\ \hline \end{array}$ | 44 |
| 45 |  | 50 | $\begin{aligned} & \hline 6 \\ & 4 \\ & \hline \end{aligned}$ | $\begin{array}{\|r\|} \hline 2 \\ 38 \\ \hline \end{array}$ | $\begin{array}{\|l} 24 \\ 50 \\ \hline \end{array}$ |  | 54 | $\begin{array}{r} 12 \\ 3 \\ \hline \end{array}$ | $\begin{aligned} & 36 \\ & 33 \end{aligned}$ | $\begin{array}{r} 3 \\ 11 \\ \hline \end{array}$ |  | 57 | $\begin{array}{\|r} 13 \\ 2 \\ \hline \end{array}$ | $\begin{aligned} & 28 \\ & 27 \\ & \hline \end{aligned}$ | $\begin{aligned} & 19 \\ & 27 \\ & \hline \end{aligned}$ |  | 59 | $8$ | $\begin{aligned} & 35 \\ & 21 \end{aligned}$ | $\begin{array}{\|l} 52 \\ 41 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 15 \\ 3^{2} \\ \hline \end{array}$ |  | 59 | 57 | $\begin{array}{\|l} \hline 56 \\ 15 \\ \hline \end{array}$ | $\begin{array}{\|l} 37 \\ 54 \\ \hline \end{array}$ | $48$ | $\begin{array}{\|l} \hline 30 \\ 33 \\ \hline \end{array}$ | 45 |
| 46 |  | 50 | $\begin{array}{r} 10 \\ 4 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{4 1} \\ & \mathbf{3 7} \end{aligned}$ | $\begin{aligned} & 14 \\ & 45 \\ & \hline \end{aligned}$ |  | 54 | $\begin{array}{r} 16 \\ 3 \end{array}$ | $\begin{array}{r} 9 \\ 3^{2} \end{array}$ | $\begin{array}{r} 14 \\ 5 \end{array}$ |  | 57 | $\begin{array}{r} 15 \\ 2 \end{array}$ | $\begin{aligned} & 55 \\ & 26 \end{aligned}$ | $\begin{aligned} & 46 \\ & 22 \end{aligned}$ |  | 59 | $9$ | $\begin{aligned} & 57 \\ & 20 \end{aligned}$ | $\begin{array}{\|l} 33 \\ 35 \\ \hline \end{array}$ | $\begin{array}{\|} 47 \\ 44 \\ \hline \end{array}$ |  | 59 | $5^{8}$ | $\begin{array}{\|l} 12 \\ 14 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{3 1} \\ & 48 \end{aligned}$ | $\begin{array}{\|l} 5^{2} \\ 15 \\ \hline \end{array}$ | $\begin{array}{\|r} 3 \\ 43 \\ \hline \end{array}$ | 46 |
| 47 |  | 50 | $\begin{array}{\|r\|} \hline 15 \\ 4 \\ \hline \end{array}$ | $\begin{aligned} & 18 \\ & 3^{6} \\ & \hline \end{aligned}$ | $\begin{aligned} & 59 \\ & 38 \end{aligned}$ |  | 54 | $\begin{array}{r} 19 \\ 3 \end{array}$ | $\begin{aligned} & \mathbf{4 1} \\ & \mathbf{3 0}^{\mathbf{0}} \end{aligned}$ | $\begin{aligned} & 19 \\ & 59 \end{aligned}$ |  | 57 | $\begin{array}{r} 18 \\ 2 \end{array}$ | $\begin{array}{\|l} 22 \\ 25 \\ \hline \end{array}$ | $\begin{array}{r} 8 \\ 16 \end{array}$ |  | 59 | $\begin{array}{r} 11 \\ 1 \end{array}$ | $\begin{aligned} & 18 \\ & 19 \end{aligned}$ | $\begin{array}{r} 9 \\ 29 \end{array}$ | $\begin{aligned} & \mathbf{3 1} \\ & 57 \\ & \hline \end{aligned}$ |  | 59 | $5^{8}$ | $\begin{aligned} & 27 \\ & 13 \end{aligned}$ | $\begin{aligned} & 20 \\ & 4^{2} \\ & \hline \end{aligned}$ | $\begin{array}{r} 7 \\ 27 \\ \hline \end{array}$ | $\begin{aligned} & 46 \\ & 55 \end{aligned}$ | 47 |
| 48 |  | 50 | $\begin{array}{r} \hline 19 \\ 4 \\ \hline \end{array}$ | $\begin{aligned} & 55 \\ & 35 \\ & \hline \end{aligned}$ | $\begin{aligned} & 37 \\ & 34 \\ & \hline \end{aligned}$ |  | 54 | $\begin{array}{r} 23 \\ 3 \\ \hline \end{array}$ | $\begin{aligned} & 12 \\ & 29 \end{aligned}$ | $\begin{aligned} & 18 \\ & 54 \\ & \hline \end{aligned}$ |  | 57 | $\begin{array}{r} 20 \\ 2 \end{array}$ | $\begin{aligned} & 47 \\ & 24 \\ & \hline \end{aligned}$ | $\begin{aligned} & 24 \\ & 10 \end{aligned}$ |  | 59 | $12$ | $\begin{array}{\|l} 37 \\ 18 \end{array}$ | $\begin{aligned} & 39 \\ & 24 \\ & \hline \end{aligned}$ | $\begin{aligned} & 28 \\ & 11 \\ & \hline \end{aligned}$ |  | 59 | 58 | $\begin{aligned} & \hline 41 \\ & 12 \end{aligned}$ | $\begin{array}{r} 2 \\ 3^{6} \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 35 \\ 40 \\ \hline \end{array}$ | $\begin{array}{r} 41 \\ 6 \end{array}$ | 48 |
| 49 |  | 50 | $\begin{array}{r} 24 \\ \hline 4 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{3 1} \\ & 34 \end{aligned}$ | $\begin{aligned} & 11 \\ & 27 \end{aligned}$ |  | 54 | $\begin{array}{r} 26 \\ \hline 3 \\ \hline \end{array}$ | $\begin{aligned} & 42 \\ & 28 \end{aligned}$ | $\begin{aligned} & 12 \\ & 48 \end{aligned}$ |  | 57 | $\begin{array}{r} 23 \\ 2 \end{array}$ | $\begin{array}{\|l} 11 \\ 23 \\ \hline \end{array}$ | $\begin{array}{r} 34 \\ \hline \end{array}$ |  | 59 | $\begin{array}{r} 13 \\ 1 \end{array}$ | $\begin{aligned} & 56 \\ & 17 \end{aligned}$ | $\begin{array}{r} 3 \\ 18 \end{array}$ | $\begin{aligned} & 39 \\ & 23 \\ & \hline \end{aligned}$ |  | 59 | $5^{8}$ | $\begin{array}{\|l\|} \hline 53 \\ 11 \end{array}$ | $\begin{aligned} & 39 \\ & 30 \\ & \hline \end{aligned}$ | $\begin{aligned} & 15 \\ & 5^{2} \end{aligned}$ | $\begin{aligned} & 47 \\ & 16 \end{aligned}$ | 49 |
| 50 | 59 | 50 | $\begin{array}{r} 29 \\ 4 \end{array}$ | $\begin{array}{r} 5 \\ 33 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 38 \\ 22 \end{array}$ | 59 | 54 | $\begin{array}{r} 30 \\ 3 \end{array}$ | $\begin{array}{\|l\|l} \hline 11 \\ \mathbf{2 7} \\ \hline \end{array}$ | $\begin{array}{r} 0 \\ 42 \end{array}$ | 59 | 57 | $\begin{array}{r} 25 \\ 2 \end{array}$ | $\begin{array}{\|l\|} \hline 34 \\ 21 \end{array}$ | $\begin{array}{\|l} 39 \\ 58 \\ \hline \end{array}$ | 59 | 59 | $\begin{array}{r} 15 \\ 1 \end{array}$ | $\begin{array}{\|l} 13 \\ 16 \end{array}$ | $\begin{array}{\|l} 22 \\ 12 \end{array}$ | $\begin{array}{r} 2 \\ 3^{6} \\ \hline \end{array}$ | 59 | 59 | 59 | $\begin{array}{r\|} \hline 5 \\ 10 \end{array}$ | $\begin{array}{\|l\|} \hline 10 \\ 25 \\ \hline \end{array}$ | $\begin{aligned} & 8 \\ & 4 \\ & \hline \end{aligned}$ | $\begin{array}{\|r} 3 \\ 27 \\ \hline \end{array}$ | 50 |
| 51 |  | 50 | $\begin{array}{\|r\|} \hline 33 \\ 4 \\ \hline \end{array}$ | $\begin{aligned} & 39 \\ & 32 \\ & \hline \end{aligned}$ | $\begin{array}{\|r} \hline \mathbf{o} \\ \mathbf{1 7} \\ \hline \end{array}$ |  | 54 | $\begin{array}{r} 33 \\ 3 \end{array}$ | $\begin{aligned} & 38 \\ & 26 \end{aligned}$ | $\begin{aligned} & \mathbf{4 2} \\ & 37 \\ & \hline \end{aligned}$ |  | 57 | $\begin{array}{r} 27 \\ 2 \end{array}$ | $\begin{array}{l\|} \hline 56 \\ 20 \end{array}$ | $\begin{array}{\|l} 37 \\ 53 \\ \hline \end{array}$ |  | 59 | $\begin{array}{r} 16 \\ 1 \end{array}$ | $\begin{aligned} & 29 \\ & 15 \\ & \hline \end{aligned}$ | $\begin{array}{r} 34 \\ 6 \end{array}$ | $\begin{array}{\|l} \hline 38 \\ 49 \\ \hline \end{array}$ |  | 59 | 59 | $\begin{array}{r} 15 \\ \hline 9 \\ \hline \end{array}$ | $\begin{aligned} & 35 \\ & 19 \end{aligned}$ | $\begin{aligned} & 12 \\ & 16 \end{aligned}$ | $\begin{array}{\|l\|} \hline 30 \\ 37 \\ \hline \end{array}$ | 51 |
| 52 |  | 50 | $\begin{array}{\|r\|} \hline 3^{8} \\ 4 \\ \hline \end{array}$ | $\begin{aligned} & \hline 11 \\ & 31 \end{aligned}$ | $\begin{aligned} & 17 \\ & 11 \\ & \hline \end{aligned}$ |  | 54 | $\begin{array}{r} 37 \\ 3 \\ \hline \end{array}$ | $\begin{array}{r} \mathbf{5} \\ 25 \end{array}$ | $\begin{aligned} & 19 \\ & 3^{1} \end{aligned}$ |  | 57 | $\begin{array}{r} 30 \\ 2 \end{array}$ | $\begin{aligned} & 17 \\ & 19 \end{aligned}$ | $\begin{aligned} & 30 \\ & 48 \end{aligned}$ |  | 59 | $\begin{array}{r} 17 \\ 1 \end{array}$ | $\begin{array}{\|l\|} \hline 44 \\ 14 \end{array}$ | $\begin{array}{\|r} 41 \\ 1 \end{array}$ | $27$ |  | 59 | 59 | $\begin{array}{r} 24 \\ 8 \end{array}$ | $\begin{aligned} & 54 \\ & 13 \\ & \hline \end{aligned}$ | $\begin{aligned} & 29 \\ & 28 \end{aligned}$ | $\begin{array}{\|r} 7 \\ 48 \\ \hline \end{array}$ | 52 |
| 53 |  | 50 | $\begin{array}{r} 42 \\ 4 \\ \hline \end{array}$ | $\begin{aligned} & 42 \\ & \mathbf{3}^{0} \end{aligned}$ | $\begin{array}{\|r\|} \hline 28 \\ 5 \\ \hline \end{array}$ |  | 54 | $\begin{array}{r} 40 \\ 3 \\ \hline \end{array}$ | $\begin{aligned} & 30 \\ & 24 \end{aligned}$ | $\begin{aligned} & 50 \\ & 25 \\ & \hline \end{aligned}$ |  | 57 | $\begin{array}{r} 32 \\ 2 \\ \hline \end{array}$ | $\begin{aligned} & 37 \\ & 18 \end{aligned}$ | $\begin{aligned} & \hline 18 \\ & 41 \\ & \hline \end{aligned}$ |  | 59 | $\begin{array}{\|r} 18 \\ 1 \\ \hline \end{array}$ | $\begin{aligned} & 58 \\ & 12 \end{aligned}$ | $\begin{aligned} & 42 \\ & 55 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline 30 \\ 15 \\ \hline \end{array}$ |  | 59 | 59 | $\begin{array}{\|r\|} \hline 33 \\ 7 \\ \hline \end{array}$ | $\begin{aligned} & 7 \\ & 7 \end{aligned}$ | $\begin{array}{\|l} \hline 57 \\ 40 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 55 \\ 57 \\ \hline \end{array}$ | 53 |
| 54 |  | 50 | $\begin{array}{r} 47 \\ 4 \\ \hline \end{array}$ | $\begin{aligned} & 12 \\ & 28 \\ & \hline \end{aligned}$ | $\begin{aligned} & 33 \\ & 59 \\ & \hline \end{aligned}$ |  | 54 | $\begin{array}{r} 43 \\ 3 \end{array}$ | $\begin{aligned} & 55 \\ & 23 \end{aligned}$ | $\begin{aligned} & 15 \\ & 19 \end{aligned}$ |  | 57 | $\begin{array}{r} 34 \\ 2 \end{array}$ | $\begin{aligned} & 55 \\ & 17 \end{aligned}$ | $\begin{aligned} & 59 \\ & 36 \end{aligned}$ |  | 59 | $20$ | $\begin{array}{\|l\|} 11 \\ 11 \end{array}$ | $\begin{array}{\|l\|} \hline 37 \\ 49 \\ \hline \end{array}$ | $\begin{aligned} & 45 \\ & 28 \end{aligned}$ |  | 59 | 59 | $\begin{array}{r} 40 \\ 6 \end{array}$ | $\begin{array}{r} 15 \\ 1 \end{array}$ | $\begin{aligned} & \hline 38 \\ & 53 \end{aligned}$ | $52$ | 54 |
| 55 |  | 50 | $\begin{array}{\|r\|} \mathbf{5 1} \\ 4 \\ \hline \end{array}$ | $\begin{aligned} & \mathbf{4 1} \\ & \mathbf{2 7} \end{aligned}$ | $\begin{aligned} & 32 \\ & 54 \end{aligned}$ |  | 54 | $\begin{array}{\|r} 47 \\ 3 \\ \hline \end{array}$ | $\begin{aligned} & \hline 18 \\ & 22 \end{aligned}$ | $\begin{aligned} & 34 \\ & 14 \end{aligned}$ |  | 57 | $\begin{array}{r} 37 \\ 2 \end{array}$ | $\begin{aligned} & 13 \\ & 16 \end{aligned}$ | $\begin{aligned} & 35 \\ & 30 \end{aligned}$ |  | 59 | $21$ | $\begin{array}{\|l} 23 \\ 10 \end{array}$ | $\begin{aligned} & \mathbf{2 7} \\ & 43 \end{aligned}$ | $13$ |  | 59 | 59 | $\begin{array}{r} 46 \\ 4 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 17 \\ 56 \\ \hline \end{array}$ | $\begin{array}{\|r} \hline 31 \\ 5 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 59 \\ 17 \\ \hline \end{array}$ | 55 |
| 56 |  | 50 | $\begin{array}{\|r\|} \hline 56 \\ 4 \end{array}$ | $\begin{array}{r} 9 \\ 26 \end{array}$ | $\begin{aligned} & 26 \\ & 48 \end{aligned}$ |  | 54 | $\begin{array}{r} 50 \\ 3 \end{array}$ | $\begin{array}{\|l} 40 \\ 21 \end{array}$ | $\begin{array}{r} 48 \\ 8 \end{array}$ |  | 57 | $\begin{array}{r} 39 \\ 2 \end{array}$ | $\left[\begin{array}{l} 30 \\ 15 \end{array}\right.$ | $\begin{array}{r} 5 \\ 24 \\ \hline \end{array}$ |  | 59 | $\begin{array}{r} 22 \\ 1 \end{array}$ | $\begin{array}{r} 34 \\ 9 \\ \hline \end{array}$ | $\begin{array}{\|l} \mathbf{1 0} \\ 37 \end{array}$ | $\begin{array}{\|l} \mathbf{5 4} \\ 53 \\ \hline \end{array}$ |  | 59 | 59 | $\left(\begin{array}{r} \mathbf{5} \\ 3 \end{array}\right.$ | $\begin{array}{\|l} 13 \\ 50 \\ \hline \end{array}$ | $\begin{array}{\|l} 37 \\ 17 \end{array}$ | $\begin{array}{\|l} \hline 16 \\ 27 \\ \hline \end{array}$ | 56 |
| 57 |  | 51 | $\begin{aligned} & \mathbf{o} \\ & 4 \\ & \hline \end{aligned}$ | $\begin{aligned} & 36 \\ & 25 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 14 \\ 43 \end{array}$ |  | 54 | $\begin{array}{r} 54 \\ 3 \end{array}$ | $\begin{array}{\|r} 1 \\ 20 \end{array}$ | $\begin{array}{r} 56 \\ 3 \end{array}$ |  | 57 | $\begin{array}{r} 41 \\ 2 \end{array}$ | $\begin{array}{\|l\|} \hline 45 \\ 14 \end{array}$ | $\begin{aligned} & 29 \\ & 18 \end{aligned}$ |  | 59 | $\begin{array}{r} 23 \\ 1 \end{array}$ | $43$ | $\begin{aligned} & 48 \\ & 32 \end{aligned}$ | $\begin{array}{r} 47 \\ 7 \\ \hline \end{array}$ |  | 59 | 59 | $\begin{array}{r} 55 \\ 2 \\ \hline \end{array}$ | $\begin{array}{\|r} \hline 3 \\ 44 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 54 \\ 29 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 43 \\ 36 \\ \hline \end{array}$ | 57 |
| 58 |  | 51 | $\begin{aligned} & 5 \\ & 4 \\ & \hline \end{aligned}$ | $\begin{array}{r} 1 \\ \mathbf{2 4} \\ \hline \end{array}$ | $\begin{aligned} & 57 \\ & 37 \\ & \hline \end{aligned}$ |  | 54 | $\begin{array}{\|r} 57 \\ 3 \\ \hline \end{array}$ | $\begin{aligned} & 21 \\ & 18 \end{aligned}$ | $\begin{aligned} & 59 \\ & 56 \end{aligned}$ |  | 57 | $\begin{array}{r} 43 \\ 2 \end{array}$ | $\begin{aligned} & 59 \\ & 13 \end{aligned}$ | $\begin{aligned} & 47 \\ & 13 \\ & \hline \end{aligned}$ |  | 59 | $\begin{array}{\|r\|} \hline 24 \\ 1 \end{array}$ | $52$ | $\begin{aligned} & 20 \\ & 26 \end{aligned}$ | $\begin{aligned} & 54 \\ & 19 \\ & \hline \end{aligned}$ |  | 59 | 59 | $\begin{array}{r} 57 \\ \hline 1 \end{array}$ | $\begin{aligned} & 48 \\ & 38 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 24 \\ 41 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline 19 \\ 46 \\ \hline \end{array}$ | 58 |
| 59 |  | 51 | $\begin{aligned} & 9 \\ & 4 \\ & \hline \end{aligned}$ | $\begin{aligned} & \hline 26 \\ & 23 \\ & \hline \end{aligned}$ | $\begin{array}{l\|} \hline 34 \\ 31 \end{array}$ |  | 55 | $\begin{aligned} & \hline \mathbf{o} \\ & 3 \\ & \hline \end{aligned}$ | $\begin{aligned} & \mathbf{4 0} \\ & \mathbf{1 0} \end{aligned}$ | $\begin{array}{\|l} 55 \\ 51 \end{array}$ |  | 57 | $\begin{array}{r} 46 \\ 2 \end{array}$ | $\begin{aligned} & \hline 13 \\ & 12 \end{aligned}$ | $\begin{aligned} & \mathbf{o} \\ & 7 \\ & \hline \end{aligned}$ |  | 59 | $\begin{array}{r} 25 \\ 1 \end{array}$ | $\begin{array}{r} 59 \\ 6 \end{array}$ | $\begin{array}{\|l} 47 \\ 20 \end{array}$ | $\begin{aligned} & 13 \\ & 3^{2} \end{aligned}$ |  | 59 | 59 | 59 | $\begin{aligned} & 27 \\ & 32 \end{aligned}$ | 6 53 | 5 | 59 |
| 60 | 59 | 51 | $\begin{array}{\|r\|} \hline 13 \\ 4 \\ \hline \end{array}$ | $\begin{aligned} & 50 \\ & 22 \\ & 22 \end{aligned}$ | $\begin{array}{r} 5 \\ 26 \end{array}$ | 59 | 55 | $\begin{aligned} & 3 \\ & 3 \end{aligned}$ | $\begin{aligned} & 58 \\ & 16 \end{aligned}$ | $\begin{aligned} & 46 \\ & 45 \end{aligned}$ | 59 | 57 | $\begin{array}{r} 48 \\ \hline \end{array}$ | $25$ | $\begin{aligned} & 7 \\ & 7 \end{aligned}$ | 59 | 59 | $\begin{array}{r} 27 \\ 1 \end{array}$ | 6 5 | $\begin{array}{r} 7 \\ 14 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 45 \\ 45 \\ \hline \end{array}$ | 60 | 0 | O | 0 | 0 | 0 | 0 | 60 |


[^0]:    ${ }^{1}$ This table is available on line at http://www.bibliotekacyfrowa.pl/dlibra/doccontent?id=45624, as well as at http://locomat.loria.fr.

[^1]:    ${ }^{2}$ Note on the titles of the works: Original titles come with many idiosyncrasies and features (line splitting, size, fonts, etc.) which can often not be reproduced in a list of references. It has therefore seemed pointless to capitalize works according to conventions which not only have no relation with the original work, but also do not restore the title entirely. In the following list of references, most title words (except in German) will therefore be left uncapitalized. The names of the authors have also been homogenized and initials expanded, as much as possible.

    The reader should keep in mind that this list is not meant as a facsimile of the original works. The original style information could no doubt have been added as a note, but we have not done it here.

