Sudoku's step by step solver

1 Introduction

On this PDF, the reader will be able to see how to solve the given sudoku:

| | Col | \rightarrow | | | | | | | | |
|----------|-----|---------------|-----------|------------|---|---|------------|-----------|-------------------|-------------------------|
| Row | | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| \ | 0 | | | 7 | | | ı | | | 2 |
| | 1 | $\bar{2}$ | | i – – | | | 5 | [| $\bar{1}$ |] |
| | 2 | | | 1 — — 1 | 8 | | 1-1- | $\bar{4}$ | г — . I |] |
| | 3 | | 1 | I | ı | 9 | - 6 | | I | 8 |
| | 4 | $\bar{7}$ | $\bar{6}$ | ı — — | | | | | $\lceil 4 \rceil$ | $\lceil \bar{9} \rceil$ |
| | 5 | | | i – – | | | · — — | ; | |] |
| | 6 | | | l ı | 1 | | 3 | | l ı | |
| | 7 | 8 | . – – | 1^{-1} | | 6 | ı — — I | ; | г — . I | 1 |
| | 8 | | | | 7 | | | | $\bar{6}$ | $\bar{3}$ |

On the following pages, with each iteration of the code, the conclusions made by the algorithm will be showed next to a representation of the sudoku with all the discovered values.

The way to refer to a particular cell will be using coordinates (r, c). This way, the value 'r' represents the row's number and 'c' the column's number. This will be represented every time the sudoku's representation is generated as you can see.

To see the code used to generate this file and solve the sudoku, please go to the author of the code's github: Jkutkut's GitHub

2 Steps

| _ | Col | \rightarrow | | | | | | | | |
|----------|-----|------------------------------|-----------------|---------------------------------|----------------|------------------------------|---------------|-----------------------------------|------------------------------------|-----------------------------------|
| Row | | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| \ | 0 | 1 | 4 | 7 | 6 | 3 | 9 | 5 | 8 | 2 |
| | 1 | $\bar{2}^{-}$ | 18 | $\bar{\bar{3}}$ $\bar{\bar{3}}$ | 4 | 7 | 5 | 9 - | 1 | · ⁻ 6 |
| | 2 | $\bar{5}^{-}$ | 9 | $\frac{+6}{6}$ | 8 | $\lceilar{2} ceil$ | 1 1 | $\lceil 4 \rceil$ | 3 | 7 |
| | 3 | 3 | · 1 | ı 4 | 5 | 9 | 6 | 2 | 7 | · 8 |
| | 4 | 7 - | 6 | $\lceil \bar{5} \rceil$ | $\overline{2}$ | $\lceil \overline{1} \rceil$ | 8 | 3 | $\begin{bmatrix} -4 \end{bmatrix}$ | [-9] |
| | 5 | $\lceil \overline{9} \rceil$ | $1\overline{2}$ | ī 8 - | 3 | $\bar{4}$ | 7 | $\begin{bmatrix} 6 \end{bmatrix}$ | 5 | 1 |
| | 6 | 6 | 7 | $\frac{1}{1}$ 2 | 1 | 5 | 3 | 8 | 9 | 4 |
| | 7 | 8 - | 3 | 1 1 | 9 | $\bar{6}$ | 4 | 7 | $\frac{1}{2}$ | $\begin{bmatrix} 5 \end{bmatrix}$ |
| | 8 | $[\overline{4}]$ | 5 | $\bar{9}^{-}$ | 7 | 8 | $\frac{1}{2}$ | 1 | 6 | _3 |

| | \mathbf{Col} | \rightarrow | | | | | | | | |
|----------|----------------|----------------|-----|----------------------------------|---------|---|-------------------|----------------|---------------|-----|
| Row | | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| \ | 0 | 1 | 4 | 7 | 6 | 3 | 9 | 5 | 8 | 2 |
| | 1 | $\bar{2}$ | 18 | $\bar{1}$ $\bar{3}$ | 4 | $\lceil \overline{7} \rceil$ | 5 | 9 | 1 | 6 |
| | 2 | $\overline{5}$ | 9 | $\frac{+6}{6}$ | 8 | $\lceil \overline{2} \rceil$ | 1 1 | $\overline{4}$ | 3 - | 7 |
| | 3 | 3 | · 1 | ı 4 | 5 | ı 9 | ⊢6 | 7 | · 2 | · 8 |
| | 4 | 7 - | -6 | $\frac{1}{5}$ | 2^{-} | $\lceil 1 \rceil$ | 18 | $\overline{3}$ | $\frac{1}{4}$ | -9 |
| | 5 | $\bar{9}$ | 2 | $\bar{1}$ $\bar{8}$ | 3 | $\bar{4}$ | $\frac{1}{7}$ | $\overline{6}$ | 5 | 1 |
| | 6 | 6 | 7 | 1 2 | 1 | ¹ 5 | 1 3 | 8 | 9 | 4 |
| | 7 | $\bar{8}^-$ | 3 | $\bar{1}$ | 9 | $\bar{6}$ | $\frac{1}{4}^{-}$ | $\overline{2}$ | 7 - | [5] |
| | 8 | $\bar{4}^-$ | 5 | $\bar{}\bar{}\bar{}\bar{}\bar{}$ | 7 | <u> 8 </u> | $\frac{1}{2}$ | 1 | 6 | -3 |

| | Col | \rightarrow | | | | | | | | |
|----------------|-----|--|----------------|-------------------------|--------------------|-------------------------|---------------|------------------|---------------|----------|
| \mathbf{Row} | | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| \ | 0 | 1 | 4 | 7 | 6 | 3 | 9 | 8 | 5 | 2 |
| | 1 | $\bar{2}^{-}$ | 18 | <u> </u> | $\overline{4}^{-}$ | $\lceil ar{7} \rceil$ | 5 | $\overline{3}$ | ī ī ¯ | [-6] |
| | 2 | $\bar{3}$ | 5 | $\frac{+6}{6}$ | 8 | $\lceil \bar{2} \rceil$ | 1 1 | $\overline{4}$ | 7 9 - | $ ^{-7}$ |
| | 3 | 4 | · 1 | ∟3 | 2 | - 9 | 6 | 5 | ı 7 | 8 |
| | 4 | 7 - | 6 | $\lceil \bar{5} \rceil$ | 3 | [ī ī | 8 | $\overline{2}$ | [4] | 9 |
| | 5 | $\overline{9}$ | $\overline{2}$ | $\overline{18}$ | 5 | $\bar{4}$ | 7 | $\overline{6}$ | 3 | 1 |
| | 6 | 6 | 7 | 2 | 1 | 5 | 3 | 9 | 8 | 4 |
| | 7 | 8 - | 3 | <u> </u> | 9 | $\overline{6}$ | 4 | $\overline{7}$ | $\frac{1}{2}$ | 5 |
| | 8 | $\begin{bmatrix} \overline{5} \end{bmatrix}$ | 9 | $\bar{1}$ $\bar{4}$ | 7 | $\lceil 8 \rceil$ | $\frac{1}{2}$ | $1 \overline{1}$ | 6 | 3 |

$Col \rightarrow$ Row $3 \mid 4 \mid$ 1 5 6 \downarrow 3 5 4 6 9 8 $\mathbf{0}$ $\frac{1}{4} - \frac{1}{7} - \frac{1}{7} - \frac{1}{5}$ $\frac{3}{3} + \frac{1}{1} + \frac{5}{6}$ $\frac{1}{2} = \frac{1}{8} = \frac{1}{1} = \frac{9}{9}$ 1 ¬ --1-5-+ $+\frac{1}{9}$ - $\frac{1}{2}$ $\bar{3}$ 2 $\bar{6}$ $\overline{4}$ 8 3 | 9 | 6 7 1 8 3 2 4 + 1 ı <u>5</u> 7.8 -1-6 $\stackrel{\scriptscriptstyle{\mathsf{T}}}{} \bar{3}$ 5 $\bar{7}$ 4 $\overline{2}$ $\frac{1}{3} \frac{4}{1} \frac{-1}{1} \frac{9}{1}$ 5 $\bar{9}$ $\bar{1}8$ $\bar{1}4$ $\overline{6}$ 5 3 $-\stackrel{|}{\downarrow}\frac{2}{1}$ 5

6 6

7

8

Row

 \downarrow

 $\frac{6}{8}$ $\frac{-1}{3}$

 $\frac{1}{5} - \frac{1}{9} - \frac{1}{4} = \frac{1}{4}$

7

2

 $\operatorname{Col} \to$ Row 3 | 4 | 5 0 $1 \mid 2$ 6 7 \downarrow $\frac{8}{3} + \frac{5}{1} - \frac{2}{6}$ 4 0 $-\frac{1}{8} - \frac{1}{9}$ $\bar{2}$ 1 7.1 -8 - - 2 $\frac{3}{4} + \frac{1}{9} - \frac{3}{7}$ $\frac{1}{3}$ $\frac{1}{1}$ $\frac{5}{5}$ $\frac{+}{1}$ $\frac{6}{6}$ 2 3 4 + 1 + 53 | 9 | 6 7 | 2 | 8 7 -1-6 1 7 8 $\bar{3}$ **5** 7 4 1 9 2 4 18 $\bar{1}4$ $\frac{1}{2}$ $\sqrt{7}$ 6 $\frac{1}{1}\frac{1}{3}$ 5 $\bar{9}$ 5 [|] 3 | 4 6 5 1 9 L 6 7 7--8--2 1 6 3 8

1

_ _

9 | 6

 $\frac{1}{7}$

 $\frac{1}{1}$

 $Col \rightarrow$ 1 | 0 $\mathbf{2}$ 3 | 4 | 5 6 | 7 | 8 13 4 7 2 6 9 $-\frac{8}{3} + \frac{1}{1} + \frac{5}{1} - \frac{2}{6}$ $\frac{1}{4} - \frac{1}{7} = \frac{5}{5}$ $\frac{1}{2} - \frac{1}{8} - \frac{1}{9}$ $\frac{1}{9} \frac{1}{1} \frac{7}{7}$ $\frac{1}{3}$ $\frac{1}{1}$ $\frac{5}{5}$ $\frac{+}{1}$ $\frac{6}{6}$ $\stackrel{\dashv}{\cdot}$ $\stackrel{-}{1}$ - + $\bar{2}$ 2 $\overline{4}$ 8 3 5 $\frac{3}{3} + 9 + 6$ $\frac{1}{2}$ | 7 11 14 $\begin{array}{c} 2 \\ \overline{2} \\ \overline{5} \\ \overline{4} \end{array}$ 7.8 $\begin{bmatrix} \frac{2}{5} & \frac{1}{4} & \frac{1}{9} \\ \frac{6}{6} & \frac{1}{3} & \frac{1}{1} \end{bmatrix}$ 4 5 1 7 | 2 $\frac{1}{4}\frac{3}{4}$ 6 6 1 5 9 $\bar{8}$ $-\,^{\vdash}_{\vdash}\,\bar{6}$ 7 9 $\frac{1}{4} - \frac{9}{9} - \frac{1}{5}$ $7^{-\frac{1}{8}} = \frac{7}{2}$

6 | 7 | 8

$\mathbf{Col} \to$

 $\mathop{\bf Row}_{\downarrow}$

| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|--------------------|-----|-------------------------|---|------------------------------|-------------------|-------------------|--------------------|------------|
| 0 | 1 | 5 | 7 | 6 | 3 | 4 | 8 | 9 | 2 |
| 1 | $\bar{2}^{-}$ | 4 | $\bar{8}^{-}$ | 0 | | 5 | 3 | 1 | <u> 6</u> |
| 2 | $\bar{3}$ | 9 | $\lceil \bar{6} \rceil$ | 8 | $\lfloor \bar{2} \rfloor$ | 1^{-1} | $\lceil 4 \rceil$ | 5 | 7 |
| 3 | 4 | · 1 | · 2 | 5 | 9 | - 6 | 7 | _ | · 8 |
| 4 | 7 - | 6 | $\lceil \bar{3} \rceil$ | 2 | 「ī ⁻ | 8 | 5 | $\frac{1}{4}$ | 9 |
| 5 | 9 - | 8 | $\bar{5}$ | 3 | $\bar{4}$ | 7 | $\overline{6}$ | $\overline{2}^{-}$ | 1 |
| 6 | 6 | 7 | 9 | 1 | 5 | 3 | 2 | 8 | 4 |
| 7 | 8 - | 3 | $\bar{1}$ | 4 | $\bar{6}$ | $\frac{1}{2}^{-}$ | 9 | 7 | 5 |
| 8 | $\overline{5}^{-}$ | 2 | $[\bar{4}]^-$ | 7 | $\lceil \overline{8} \rceil$ | 9 | 1 | 6 | -3 |

$\mathbf{Col} \rightarrow$

 $\mathbf{Row} \\ \downarrow$

| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|--------------------|---------------|-------------------------|--------------------|---------------------------|---------------|-----------------------------------|-----|-----|
| 0 | 1 | 5 | 7 | 6 | 3 | 4 | 8 | 9 | 2 |
| 1 | $\bar{2}^{-}$ | 4 | 8 - | 9 | $\lceil 7 \rceil$ | 5 | $\overline{3}$ | 1 | 6 |
| 2 | $\bar{3}$ | 9 | $\lceil \bar{6} \rceil$ | 8 | $\lfloor \bar{2} \rfloor$ | 1 1 | $\overline{4}$ | 5 | 7 |
| 3 | 4 | · 1 | - 3 | 5 | 9 | - 6 | 7 | · 2 | · 8 |
| 4 | 7 - | 6 | $\lceilar{2}\rceil$ | 3 | [[| 8 | $\overline{5}$ | [4] | 9 |
| 5 | $\bar{9}$ | 8 | $\bar{5}$ | $\overline{2}^{-}$ | $\bar{4}$ | 7 | $\begin{bmatrix} 6 \end{bmatrix}$ | 3 | 1 |
| 6 | 6 | 7 | 9 | 1 | 5 | 3 | 2 | 8 | 4 |
| 7 | $\bar{8}^-$ | 3 | $\bar{1}$ | $\overline{4}^{-}$ | $\bar{6}$ | $\frac{1}{2}$ | 9 | 7 | 5 |
| 8 | $\overline{5}^{-}$ | $\frac{1}{2}$ | $\bar{4}$ | 7 | $\lceil 8 \rceil$ | 9 | $\lceil 1 \rceil$ | 6 | -3 |

$Col \rightarrow$ Row 3 | 4 |7 1 5 6 \downarrow ____2 3 ₁ 5 $\overline{9}$ 6 4 8 $\mathbf{0}$ $\frac{1}{9}$ $\frac{1}{7}$ $\frac{1}{7}$ $\frac{1}{5}$ $\frac{1}{2} - \frac{1}{4} - \frac{1}{8} = \frac{1}{8}$ $\frac{1}{3} + \frac{1}{1} + \frac{1}{6} = \frac{1}{6}$ 1 ¬ -3 -1-9-+ $\frac{1}{8}$ $\frac{1}{2}$ 2 $\bar{6}$ $\overline{4}$ 2 | 9 | 6 3 7 4 + 1 ı <u>5</u> +3 + 8-1-6 · [1 3 8 $\begin{bmatrix} 5 & 7 & 4 & -1 & 9 \\ 6 & 1 & 2 & 1 & 1 \end{bmatrix}$ $\bar{7}$ 3 4 - - - - - 5 5 $\bar{9}$ $\overline{4}$ $\frac{2}{9} + \frac{8}{7} + \frac{5}{4}$ 6 6 7 9 1 $^{\mathsf{T}}4$ 3 $\frac{1}{1}\frac{3}{2}$ $\frac{6}{8} - \frac{1}{3} - \frac{7}{3}$ _ + - ⊢ 7 $\bar{1}$ 5 6 1 $\frac{5}{5} - \frac{1}{2} - \frac{1}{4} = \frac{7}{4}$ $7^{-1}8^{-1}9$ 1 6 3 8

 $\operatorname{Col} \to$ Row 3 | 4 | 5 0 $1 \mid 2$ 6 7 \downarrow $\frac{8}{3} + \frac{9}{1} - \frac{2}{6}$ 5 0 $\frac{1}{2} - \frac{1}{4} - \frac{1}{8} = \frac{1}{8}$ 1 $\frac{3}{8} - \frac{1}{2} = \frac{3}{1}$ $\frac{3}{4} + \frac{1}{5} - \frac{3}{7}$ $\frac{2}{3}$ -1-9- + $\frac{6}{6}$ 2 3 4 + 1 + 52 | 9 | 6 7 | 3 | 8 7 -1-6 1 7 8 **5** 7 4 1 9 3 4 $\frac{1}{1} \frac{4}{2} - \frac{3}{1} \frac{3}{1}$ $\bar{1}4$ $\sqrt{7}$ 6 5 $\bar{9}$ 5 2 9 1 8 1 4 1 7 1 5 6 5 1 3 $\frac{3}{1}$ _ _ **4** ⁻ ⁻ 6 7 $\frac{1}{7}$ 1 6 - 3 8

 $Col \rightarrow$ Row $1 \mid 2$ 0 3 | 4 | 5 6 | 7 | 8 ____3 5 7 $\frac{6}{9} + \frac{3}{7} + \frac{4}{5}$ 2 $-\frac{8}{3} + \frac{9}{1} - \frac{2}{6}$ $\frac{1}{2} - \frac{1}{4} - \frac{1}{8} = \frac{1}{8}$ ¬ - $\frac{3}{8} - \frac{1}{2}$ $\frac{1}{3}$ $\frac{1}{1}$ $\frac{9}{9}$ $\frac{+}{1}$ $\frac{6}{6}$ + 5 -1-7 2 $\overline{4}$ 3 1 5 $\frac{3}{3} + 9 + 6$ 7 | 2 | 8 4 + 1 $\begin{bmatrix} 2 & 1 & 3 & 8 \\ 4 & 5 & 7 \end{bmatrix}$ $\begin{bmatrix} 5 & 7 & 4 & -1 & 9 \\ 6 & 7 & 3 & 1 & 1 \end{bmatrix}$ 4 5 6 2 6 9 1 4 3 $\frac{6}{8} - \frac{7}{3} - \frac{1}{4} = \frac{9}{1}$ $\frac{1}{7} + \frac{3}{7} - \frac{3}{1} + \frac{3}{4}$ + 1 $\frac{1}{1}\frac{5}{2}$ 5 6 9 7 $\frac{1}{7}$ $\frac{1}{1} + \frac{1}{6} + \frac{1}{3}$

 \downarrow

| | Col | \rightarrow | | | | | | | | |
|----------|-----|---------------|-----------------|-------------------------|---|-------------------------|-----------------------------|----------------|--------------------|-----------------|
| Row | | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| \ | 0 | 1 | 5 | 7 | 6 | 3 | 4 | 8 | 9 | 2 |
| | 1 | $\bar{2}^{-}$ | 4 | ī 8 - | 9 | 7 - | 5 | $\overline{3}$ | 1 | · ⁻⁶ |
| | 2 | 3 - | 9 | $\frac{+}{6}$ $^{-}$ | 8 | $\lceil \bar{2} \rceil$ | 17 | $\overline{4}$ | $\frac{1}{5}$ | 7 |
| | 3 | 5 | · 1 | · 2 | 4 | 9 | □ 6 | 7 | · 3 | · 8 |
| | 4 | 7 - | 6 | $\lceil \bar{3} \rceil$ | 2 | $\lceil 1 \rceil$ | 18 | 5 | 4^{-} | -9 |
| | 5 | 9 - | 8 | $\bar{4}$ | 3 | $\bar{5}^{-}$ | 7 | $\overline{6}$ | $\overline{2}^{-}$ | i 1] |
| | 6 | 6 | ¦ 7 | 1 9 | 1 | 4 | 1 3 | 2 | 8 | ¦ 5 |
| | 7 | 8 - | 3 | - ī ⁻ | 5 | $\bar{6}^{-}$ | $\frac{1}{1}$ $\frac{1}{2}$ | 9 - | 7 - | [4] |
| | 8 | $\bar{4}^-$ | ! ⁻² | $\bar{5}^{-}$ | 7 | 8 - | 9 | 1 | 6 | -3 |

| | Col | \rightarrow | | | | | | | | |
|----------------|----------------|---------------|-----|---|--------------------|-------------------------|---------------|-----------------------------------|-----|------------------------------------|
| \mathbf{Row} | | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| \ | 0 | 1 | 5 | 7 | 6 | 3 | 4 | 8 | 9 | 2 |
| | 1 | $\bar{2}^{-}$ | 4 | <u>-</u> 8 - | 9 | $\lceil ar{7} \rceil$ | 5 | $\overline{3}$ | 1 | $\begin{bmatrix} -6 \end{bmatrix}$ |
| | 2 | $\bar{3}$ | 9 | $\stackrel{+}{\scriptstyle 6}$ $\stackrel{-}{\scriptstyle 6}$ | 8 | $\lceil \bar{2} \rceil$ | 1 1 | $\overline{4}$ | 5 | 7 |
| | 3 | 5 | · 1 | · 3 | 4 | - 9 | - 6 | 7 | · 2 | 8 |
| | $\overline{4}$ | 7 - | 6 | $\lceil \bar{2} \rceil$ | 3 | [ī- | 8 | 5 | [4] | 9 |
| | 5 | $\frac{1}{9}$ | 8 | $\bar{4}$ | $\overline{2}^{-}$ | $\overline{5}$ | 7 | $\begin{bmatrix} 6 \end{bmatrix}$ | 3 | 1^{-1} |
| | 6 | 6 | 7 | ¦ 9 | 1 | ¦ 4 | 3 | 2 | 8 | 5 |
| | 7 | $\bar{8}^-$ | 3 | ī ī ⁻ | 5 | [6] | $\frac{1}{2}$ | 9 | 7 | $\begin{bmatrix} -4 \end{bmatrix}$ |
| | 8 | 4 | 2 | $\bar{5}$ | 7 | $\lceil 8 \rceil$ | 9 | 1 | 6 | 3 |

$Col \rightarrow$ Row 3 | 4 |1 5 6 \downarrow 3 5 8 6 4 $\mathbf{0}$ $\frac{1}{9}$ $\frac{1}{7}$ $\frac{1}{7}$ $\frac{1}{5}$ $\frac{1}{2} - \frac{1}{4} - \frac{1}{1} = \frac{1}{8}$ $\frac{1}{3} + \frac{1}{1} + \frac{1}{6} = \frac{1}{6}$ 1 3 -1-9-+ $\frac{1}{8}$ $\frac{1}{2}$ $\frac{1}{1}$ 2 $\bar{6}$ $\overline{4}$ 2 | 9 | 6 3 7 5 + 1 ı 4 $\begin{bmatrix} 5 & 7 & 4 & -1 & 9 \\ \hline 6 & 1 & 2 & 1 & 1 \end{bmatrix}$ 3 8 -1-6 $\bar{7}$ 3 4 - L - _ 5 $\bar{9}$ $\overline{4}$

9

 $\bar{1}$

_ +

1 4 - 2 - 5 1 $^{\mathsf{T}}4$

_ _

5 6

 $7^{-1}8^{-1}9$

3 $\frac{1}{1}\frac{3}{2}$

6 6 7

7

8

 $\frac{6}{8} - \frac{1}{3} - \frac{7}{3}$

7 | 8

13 18

1 6 3

 $\overline{9}$

____2

 $\operatorname{Col} \to$ Row 3 | 4 | 5 0 $1 \mid 2$ 6 7 | 8 \downarrow $\frac{8}{3} + \frac{9}{1} - \frac{2}{6}$ 5 0 1 $\frac{1}{2} - \frac{1}{4} - \frac{1}{8} = \frac{1}{8}$ 1 $\frac{9}{8} + \frac{1}{2} + \frac{3}{1}$ $\frac{3}{4} + \frac{1}{5} - \frac{3}{7}$ $\frac{2}{3}$ -1-9- + $\frac{6}{6}$ 2 3 5 + 1 + 42 | 9 | 6 7 | 3 | 8 3^{-1} 1 $\frac{1}{8}$ **5** 7 4 1 9 4 $\frac{3}{7}$ $\frac{1}{1} \frac{4}{2} - \frac{3}{1} \frac{3}{1}$ $\bar{1}4$ 6 5 5 6 5 1 3 $\frac{1}{1}\frac{3}{2}$ _ _ **4** ⁻ ⁻ 6 7 $\frac{1}{7}$ 1 6 - 3 8

 $Col \rightarrow$ Row $1 \mid 2$ 0 3 | 4 | 5 6 | 7 | 8 \downarrow 5 $\frac{6}{9} - \frac{3}{7} - \frac{4}{5}$ 7 2 $-\frac{8}{3} + \frac{9}{1} - \frac{2}{6}$ $\frac{1}{2} - \frac{1}{4} - \frac{1}{8} = \frac{1}{8}$ $\frac{3}{8} - \frac{1}{2}$ $\bar{1}$ $\frac{1}{3}$ $\frac{1}{1}$ $\frac{9}{9}$ $\frac{+}{1}$ $\frac{6}{6}$ + 5 -1-7 2 $\overline{4}$ 3 5 $\frac{3}{3} + 9 + 6$ 7 | 2 | 8 + 1 ı 4 $\begin{bmatrix} 2 & 1 & 1 & 8 \\ 4 & 5 & 7 \end{bmatrix}$ $\begin{bmatrix} 5 & 7 & 4 & -1 & 9 \\ 6 & 7 & 3 & 1 & 1 \end{bmatrix}$ 4 5 6 1 4 2 6 9 1 3 $\frac{1}{7} + \frac{3}{7} - \frac{3}{1} + \frac{3}{4}$ $\frac{1}{1}$ $\frac{1}{1}\frac{5}{2}$ 5 6 9 7 $\frac{1}{7}$ $\frac{1}{1} + \frac{1}{6} + \frac{1}{3}$

| | Col | \rightarrow | | | | | | | | |
|----------|-----|---------------|---------------------|-------------------------|--------------------|-------------------------|-------------------|-------------------|---------------|-----|
| Row | | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| \ | 0 | 1 | 5 | 7 | 6 | 3 | 4 | 8 | 9 | 2 |
| | 1 | $\bar{2}^{-}$ | 4 | ī 8 - | 9 | - 7 - | 5 | $\overline{3}$ | 1 | 6 |
| | 2 | $\bar{3}$ | 9 | $\bar{6}$ | 8 | $\lceil \bar{2} \rceil$ | 1 1 | $\lceil 4 \rceil$ | 7 - | [5] |
| | 3 | 4 | · 1 | · 2 | 5 | 9 | - 6 | 7 | · 3 | 8 |
| | 4 | 7 - | 6 | $\lceil \bar{3} \rceil$ | $\overline{2}^{-}$ | 「ī ⁻ | 8 | 5 | $\frac{1}{4}$ | 9 |
| | 5 | 9 - | 8 | $\overline{5}$ | 3 | $\bar{4}$ | 7 | $\overline{6}$ | $\frac{1}{2}$ | 1 |
| | 6 | 6 | 7 | 9 | 1 | 5 | 3 | 2 | 8 | 4 |
| | 7 | $\bar{8}^-$ | 3 | - ī ⁻ | $\overline{4}^{-}$ | $\bar{6}^{-}$ | $\frac{1}{2}^{-}$ | 9 | 5 | 7 |
| | 8 | $\bar{5}^{-}$ | $\lfloor 2 \rfloor$ | $\bar{4}^-$ | 7 | $\lceil \bar{8} \rceil$ | 9 | $\lceil 1 \rceil$ | 6 | 3 |

| _ | Col | \rightarrow | | | | | | | | |
|-----|-----|-------------------------|------|-------------------------|---------|-------------------------------|--------------------|-------------------|--------------------|------------------------------------|
| Row | | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 4 | 0 | 1 | 5 | 7 | 6 | 3 | 4 | 8 | 9 | 2 |
| | 1 | $\bar{2}^{-}$ | 4 | ī <u>8</u> - | 9 | $\bar{}^{}$ | 5 | $\overline{3}$ | 1 | 6 |
| | 2 | $\bar{3}$ | ¦_9_ | $\frac{+6}{6}$ | 8 | $\lceil \bar{2} \rceil$ | 1 | $\overline{4}$ | 7 | 5 |
| | 3 | 4 | · 1 | ⊢ 3 | 5 | 9 | 6 | 7 | 2 | · 8 |
| | 4 | 7 - | 6 | $\lceil \bar{2} \rceil$ | 3 | $\lceil \overline{1} \rceil$ | 8 | $\overline{5}$ | 4^{-} | [-9] |
| | 5 | $\lceil \bar{9} \rceil$ | 8 | $\bar{5}$ | 2^{-} | $\bar{1}$ $\bar{4}$ $\bar{1}$ | 7 | $\overline{6}$ | $\overline{3}^{-}$ | 1 |
| | 6 | 6 | 7 | 9 | 1 | 5 | 3 | 2 | 8 | 4 |
| | 7 | $\bar{8}^-$ | 3 | $\bar{1}$ | 4 | $\bar{6}$ | $\overline{2}^{-}$ | $\overline{9}$ | $\overline{5}^{-}$ | $\begin{bmatrix} -7 \end{bmatrix}$ |
| | 8 | $\overline{5}^{-}$ | 12 | $\lceil ar{4} \rceil$ | 7 | Ī 8 T | 9 | $\lceil 1 \rceil$ | 6 | [3] |

$Col \rightarrow$ Row 3 | 4 |7 1 5 6 \downarrow ____2 3 5 $\overline{9}$ 6 4 8 $\mathbf{0}$ $\frac{1}{9}$ $\frac{1}{7}$ $\frac{1}{7}$ $\frac{1}{5}$ $\frac{3}{3} + \frac{1}{1} + \frac{5}{6} = \frac{1}{6}$ $\frac{1}{2} - \frac{1}{4} - \frac{1}{8} = \frac{1}{8}$ 1 ¬ -3 -1-9-+ $\frac{1}{8}$ $\frac{1}{2}$ 2 $\bar{6}$ $\overline{4}$ 2 | 9 | 6 3 4 | 1 ı <u>5</u> 7 +3 + 83 8 -,-6 $\bar{7}$ 3 4 5 $\bar{9}$ $\bar{1}4$ 5 $\frac{2}{9} + \frac{8}{5} + \frac{4}{7}$ 6 6 7 9 1 5 3 $\frac{1}{1}\frac{3}{2}$ $\frac{6}{8}$ $\frac{1}{3}$ _ _ _ + $\bar{1}$ 7 **4** | 6 1 $\frac{5}{5} - \frac{1}{2} - \frac{1}{4} = \frac{7}{4}$ 7--8-19 1 6 3 8

 $\operatorname{Col} \to$ Row 3 | 4 | 5 0 1 $\mathbf{2}$ 6 7 \downarrow $\frac{8}{3} + \frac{9}{1} - \frac{2}{6}$ 5 0 $\frac{1}{2} - \frac{1}{4} - \frac{1}{8} = \frac{1}{8}$ 1 7.1 $\frac{3}{8} - \frac{1}{2}$ $\frac{3}{4} + \frac{1}{7} - \frac{3}{1} - \frac{5}{5}$ $\frac{2}{3}$ -1-9- + $\frac{6}{6}$ 2 3 4 + 1 + 53 | 9 | 6 7 | 2 | 8 5 7 4 9 7 -1-6 1 7 8 $\bar{3}$ 4 $\frac{1}{3} \frac{4}{3} - \frac{3}{1} \frac{3}{1}$ -1-²- L $\bar{1}4$ $\bar{2}$ $\sqrt{7}$ 6 5 $\bar{9}$ 5 $\frac{2}{9} + \frac{8}{5} + \frac{4}{7}$ 6 5 1 3 $\frac{3}{1}$ _ ∟ **4** ⁻ ⁻ 6 7 7--8--9 1 - 6 - 3 8

Row

 \downarrow

 $Col \rightarrow$ 0 1 | $\mathbf{2}$ 3 | 4 | 5 6 | 7 | 8 3 5 7 9 2 6 4 $-\frac{8}{3} + \frac{9}{1} - \frac{2}{6}$ $\frac{6}{9} - \frac{1}{7} = \frac{7}{5}$ $\frac{1}{2} - \frac{1}{4} - \frac{1}{8} = \frac{1}{8}$ - <u>-</u> - 2 $\frac{1}{3}$ $\frac{1}{1}$ $\frac{9}{9}$ $\frac{+}{1}$ $\frac{6}{6}$ $\stackrel{\dashv}{\cdot}$ $\stackrel{-}{1}$ 2 -8 $\overline{4}$ 3 2 + 9 + 6 7 + 3 + 85 + 1 ı 4 $\begin{array}{c|c} - & \frac{3}{4} & \frac{3}{8} \\ - & \frac{4}{4} & \frac{7}{7} \end{array}$ $\begin{bmatrix} 5 & 1 & 4 & 1 & 9 \\ 6 & 1 & 2 & 1 & 1 \end{bmatrix}$ 4 3 5 _5⁻ 6 2 6 9 1 5 3 $-\frac{1}{3} + \frac{9}{1}$ $+\frac{6}{5} - 1 - \frac{4}{7}$ $\frac{1}{1}\frac{5}{2}$ $\bar{8}$ $\frac{1}{4}$ $\frac{1}{6}$ 9 7 $7^{-\frac{1}{8}} = \frac{1}{9}$ $\bar{4}$ 1 - 6 - 3

$\mathbf{Col} \to$ Row ↓ 3 | 4 | 5 6 | 7 | 8 1 2 3 4 5 6 8

| Col | \rightarrow | | | | | | | | |
|-----|--|---|--|--|--|--|--|--|--|
| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 0 | 1 | 5 | 7 | 6 | 3 | 4 | 8 | 9 | 2 |
| 1 | $\bar{2}^{-}$ | 4 | 8 - | 9 | $\lceil 7 \rceil$ | 5 | $\overline{3}$ | 1 | $\begin{bmatrix} -6 \end{bmatrix}$ |
| 2 | $\overline{6}$ | 9 | $\bar{3}$ | 8 | $\lceil \bar{2} \rceil$ | 1 1 | $\overline{4}$ | 5 | 7 |
| 3 | 3 | · 1 | ı <u>4</u> | 5 | 9 | - 6 | 7 | · 2 | 8 |
| 4 | 7 - | 6 | $\lceil \bar{2} \rceil$ | 3 | $\lceil 1 \rceil$ | 8 | 5 | $\frac{1}{4}$ | 9 |
| 5 | $\overline{5}$ | 8 | $-\frac{1}{9}$ | $\overline{2}^{-}$ | $\bar{4}$ | 7 | $\overline{6}$ | 3 | 1 |
| 6 | 9 | ¦ 7 | 6 | 1 | 5 | 3 | 2 | 8 | 4 |
| 7 | 8 - | 3 | - ī ⁻ | $\overline{4}^{-}$ | $\bar{6}$ | $\frac{1}{2}^{-}$ | 9 - | 7 | [5] |
| 8 | $\overline{4}^{-}$ | 12 | $\bar{5}$ | 7 | $\bar{8}$ | 9 | 1 | 6 | 3 |
| | $egin{array}{c} 0 \\ 1 \\ 2 \\ 3 \\ 4 \\ \hline 5 \\ 6 \\ 7 \\ \hline \end{array}$ | $\begin{array}{c cccc} 0 & 1 & 2 \\ 1 & 2 & 6 \\ 2 & 6 & 3 \\ 3 & 3 & 7 \\ 5 & 5 & 5 \\ 6 & 9 \\ 7 & 8 \end{array}$ | $\begin{array}{c c c} & 0 & 1 \\ \hline 0 & \frac{1}{2} - \frac{5}{4} \\ \hline 2 & 6 - 9 \\ \hline 3 & 3 + 1 \\ \hline 4 & 7 - 6 \\ \hline 5 & 5 - 8 \\ \hline 6 & 9 + 7 \\ \hline 7 & 8 - 3 \\ \hline \end{array}$ | $\begin{array}{c c c c c c c c c c c c c c c c c c c $ | $\begin{array}{c c c c c c c c c c c c c c c c c c c $ | $\begin{array}{c c c c c c c c c c c c c c c c c c c $ | $\begin{array}{c c c c c c c c c c c c c c c c c c c $ | $\begin{array}{c c c c c c c c c c c c c c c c c c c $ | $\begin{array}{c c c c c c c c c c c c c c c c c c c $ |

| | Col | \rightarrow | | | | | | | | |
|----------------|-----|----------------|-----|-------------------------|--------------------|-------------------------|-----------------------------|-----------------------------------|------------------------------------|--------------------|
| \mathbf{Row} | | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| \ | 0 | 1 | 5 | 7 | 6 | 3 | 4 | 8 | 9 | 2 |
| | 1 | $\bar{2}$ | 4 | <u>-</u> 8 - | 9 | $\lceil ar{7} \rceil$ | 5 | $\overline{3}$ | 1 | · ⁻ 6] |
| | 2 | $\overline{6}$ | 9 | $\bar{3}$ | 8 | $\lceil \bar{2} \rceil$ | 11 | $\overline{4}$ | 5 | 7 |
| | 3 | 3 | · 1 | ı <u>5</u> | 4 | - 9 | - 6 | 7 | · 2 | · 8 |
| | 4 | $\bar{7}^{-}$ | 6 | $\lceil \bar{2} \rceil$ | 3 | [ī ī | 8 | 5 | $\begin{bmatrix} -4 \end{bmatrix}$ | [-9-] |
| | 5 | $ar{4}^-$ | 8 | $-\frac{1}{9}$ | $\overline{2}^{-}$ | $\overline{5}$ | 7 | $\begin{bmatrix} 6 \end{bmatrix}$ | $\overline{3}^{-}$ | 1 |
| | 6 | 9 | 7 | 6 | 1 | ¦ 4 | 3 | 2 | 8 | 5 |
| | 7 | 8 - | 3 | $\bar{1}$ | 5 | [6] | $\frac{1}{1}$ $\frac{1}{2}$ | 9 | 7 | 4 |
| | 8 | 5 - | 2 | $\bar{4}$ | 7 | $\lceil 8 \rceil$ | 9 | 1 | 6 | 3 |

$\mathbf{Col} \to$ $\mathop{\bf Row}_{\downarrow}$ 3 | 4 | 5 6 $egin{array}{c|c} 0 & 1 & \\ \hline 2 & 3 & \\ \hline 4 & 5 & \\ \hline 6 & 7 & \\ \hline \end{array}$

| | Col | \rightarrow | | | | | | | | |
|----------|-----|----------------|-----|-------------------------|--------------------|-------------------------|--------------------|----------------|--------------------|------------------------------------|
| Row | | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| + | 0 | 1 | 5 | 7 | 6 | 3 | 4 | 8 | 9 | 2 |
| | 1 | $\bar{2}^{-}$ | 4 | $\bar{8}$ | 9 | 7 | 5 | 3 | 1 | $\begin{bmatrix} -6 \end{bmatrix}$ |
| | 2 | $\overline{6}$ | 9 | $\bar{3}$ | 8 | $\lceil \bar{2} \rceil$ | 1 | $\overline{4}$ | 5 | 7 |
| | 3 | 4 | · 1 | ı <u>5</u> | 2 | 9 | 6 | 7 | · 3 | 8 |
| | 4 | 7 - | 6 | $\lceil \bar{2} \rceil$ | 3 | $\lceil 1 \rceil$ | 8 | 5 | $\frac{1}{4}$ | 9 |
| | 5 | $\bar{3}$ | 8 | $\bar{9}^{-}$ | 5 | $\bar{4}$ | 7 | $\overline{6}$ | $\overline{2}^{-}$ | 1 |
| | 6 | 9 | ¦ 7 | 6 | 1 | 5 | 3 | 2 | 8 | 4 |
| | 7 | 8 - | 3 | - ī - | $\overline{4}^{-}$ | $\bar{6}$ | $\overline{2}^{-}$ | 9 | 7 | [5] |
| | 8 | $\bar{5}^{-}$ | 2 | $\bar{4}$ | 7 | $\overline{8}$ | 9 | 1 | 6 | 3 |

| | Col | \rightarrow | | | | | | | | |
|----------------|-----|----------------|-----|-------------------------|--------------------|---------------------------|-------------------|----------------|--------------------|------|
| \mathbf{Row} | | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| + | 0 | 1 | 5 | 7 | 6 | 3 | 4 | 8 | 9 | 2 |
| | 1 | $\bar{2}^{-}$ | 4 | ī 8 - | 9 | $\lceil 7 \rceil$ | 5 | $\overline{3}$ | 1 | -6 |
| | 2 | $\overline{6}$ | 5 | $\bar{3}^{-}$ | 8 | $\lfloor \bar{2} \rfloor$ | ' 1 - | $\overline{4}$ | 5 | 7 |
| | 3 | 5 | · 1 | ı 4 | 2 | · 9 | □ 6 | 7 | - 3 | · 8 |
| | 4 | 7 - | 6 | $\lceil \bar{2} \rceil$ | 3 | [[| 8 | 5 | 4^{-} | [-9] |
| | 5 | $\bar{3}$ | 8 | $-\frac{1}{9}$ | $\overline{4}^{-}$ | $\overline{5}$ | $\overline{7}$ | $\overline{6}$ | $\overline{2}^{-}$ | 1 |
| | 6 | 9 | 7 | 6 | 1 | 4 | 3 | 2 | 8 | 5 |
| | 7 | $\bar{8}^-$ | 3 | īī - | 5 | $\bar{6}$ | $\frac{1}{2}^{-}$ | 9 | 7 | 4 |
| | 8 | $\bar{4}^-$ | 12 | $\bar{5}$ | 7 | [8] | 9 | 1^{-1} | 6 | -3 |
| | | | | | | | | | | |

| _ | Col | \rightarrow | | | | | | | | |
|----------|-----|--------------------|-----|-------------------------|--------------------|-------------------------|-------------------|----------------|---------------|------------------------------------|
| Row | | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| + | 0 | 1 | 5 | 7 | 6 | 3 | 4 | 8 | 9 | 2 |
| | 1 | $\bar{2}^{-}$ | 4 | ī 8 - | 9 | 7 - | 5 | $\overline{3}$ | 1 | $\begin{bmatrix} -6 \end{bmatrix}$ |
| | 2 | $\overline{6}$ | -9 | $\bar{3}^{-}$ | 8 | $\lceil \bar{2} \rceil$ | 1 1 | $\overline{4}$ | 7 - | 5 |
| | 3 | 3 | · 1 | ı 4 | 5 | 9 | - 6 | 7 | · 2 | 8 |
| | 4 | 7 - | 6 | $\lceil \bar{2} \rceil$ | 3 | $\lceil 1 \rceil$ | 8 | 5 | $\frac{1}{4}$ | 9 |
| | 5 | $\overline{5}^{-}$ | 8 | $-\frac{1}{9}$ | $\overline{2}^{-}$ | $\bar{4}$ | 7 | $\overline{6}$ | 3 | 1 |
| | 6 | 9 | 7 | 6 | 1 | 5 | 3 | 2 | 8 | 4 |
| | 7 | $\bar{8}^-$ | 3 | - ī ⁻ | $\overline{4}^{-}$ | $\bar{6}$ | $\frac{1}{2}^{-}$ | 9 - | 5 | 7 |
| | 8 | $\bar{4}^-$ | 2 | $\bar{5}$ | 7 | $\overline{8}$ | 9 | 1 | 6 | 3 |
| | | | | | | | | | | |

| _ | Col | \rightarrow | | | | | | | | |
|----------|-----|----------------|-----|-------------------------|---|-----------------------------------|---------------|----------------|-----------------------------------|-------|
| Row | | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| + | 0 | 1 | 5 | 7 | 6 | 3 | 4 | 8 | 9 | 2 |
| | 1 | $\bar{2}$ | 4 | ī <u>8</u> - | 9 | - 7 - | 5 | 3 | 1 | · 6 |
| | 2 | $\overline{6}$ | -9 | $\bar{3}^{-}$ | 8 | $\lceil \bar{2} \rceil$ | 1 1 | $\overline{4}$ | 7 - | 5 |
| | 3 | 4 | · 1 | ı <u>5</u> | 2 | - 9 | - 6 | 7 | - 3 | · 8 |
| | 4 | 7 - | 6 | $\lceil \bar{2} \rceil$ | 3 | [ī ī | 8 | $\overline{5}$ | [4] | [-9-] |
| | 5 | $\bar{3}$ | 18 | $-\frac{1}{9}$ | 5 | $\bar{4}$ | 7 | $\overline{6}$ | $\overline{2}^{-}$ | 1 |
| | 6 | 9 | 7 | 6 | 1 | 5 | 3 | 2 | 8 | 4 |
| | 7 | $\bar{8}^{-}$ | 3 | ī ī ¯ | 4 | $\begin{bmatrix} 6 \end{bmatrix}$ | $\frac{1}{2}$ | 9 | $\begin{bmatrix} 5 \end{bmatrix}$ | [7] |
| | 8 | 5 | 12 | $\lceil ar{4} \rceil$ | 7 | 8 | 9 | 1 | 6 | [3] |

| | Col | \rightarrow | | | | | | | | |
|----------|-----|--------------------|-----|-------------------------|--------------------|-------------------------|--------------------|----------------|---------------|------------------------------------|
| Row | | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| + | 0 | 1 | 5 | 7 | 6 | 3 | 4 | 8 | 9 | 2 |
| | 1 | $\bar{2}^{-}$ | 8 | $\bar{4}$ | 9 | $\overline{7}$ | 5 | $\overline{3}$ | 1 | $\begin{bmatrix} -6 \end{bmatrix}$ |
| | 2 | 3 - | 9 | $\frac{+}{6}$ $^{-}$ | 8 | $\lceil \bar{2} \rceil$ | 1 | $\overline{4}$ | 5 | 7 |
| | 3 | 4 | · 1 | · 3 | 2 | 9 | 6 | 5 | · 7 | 8 |
| | 4 | 7 - | 6 | $\lceil \bar{5} \rceil$ | 3 | $\lceil 1 \rceil$ | 8 | 2 | $\frac{1}{4}$ | 9 |
| | 5 | 9 - | 2 | $\overline{8}$ | $\overline{4}^{-}$ | $\overline{5}$ | 7 | $\overline{6}$ | 3 | 1 |
| | 6 | 6 | ¦ 7 | 1 2 | 1 | 4 | 3 | 9 | 8 | 5 |
| | 7 | 8 - | 3 | - ī ⁻ | 5 | $\bar{6}$ | 9 | $^{-7}^{-}$ | $\frac{1}{2}$ | 4 |
| | 8 | $\overline{5}^{-}$ | 4 | $\bar{9}^{-}$ | 7 | $\overline{8}$ | $\overline{2}^{-}$ | 1 | 6 | 3 |

| | Col | \rightarrow | | | | | | | | |
|----------------|----------------|----------------|-----|-------------------------|--------------------|-------------------------|---------------|-----------------------------------|--------------------|-----------------------------------|
| \mathbf{Row} | | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| \ | 0 | 1 | 5 | 7 | 6 | 3 | 4 | 8 | 9 | 2 |
| | 1 | $\bar{2}^{-}$ | 18 | $\bar{4}^-$ | 9 | $\lceil ar{7} \rceil$ | 5 | $\overline{3}$ | 1 | 6 |
| | 2 | $\bar{3}$ | 5 | $\frac{+}{6}$ $\bar{6}$ | 8 | $\lceil \bar{2} \rceil$ | 1 1 | $\overline{4}$ | 5 | 7 |
| | 3 | 4 | · 1 | · 3 | 2 | - 9 | - 6 | 5 | 1 7 | 8 |
| | $\overline{4}$ | 7 - | 6 | $\lceil \bar{5} \rceil$ | 3 | [ī- | 8 | $\overline{2}$ | [4] | 9 |
| | 5 | $\overline{9}$ | 2 | $\overline{8}$ | 5 | $\bar{4}$ | 7 | $\begin{bmatrix} 6 \end{bmatrix}$ | $\overline{3}^{-}$ | 1 |
| | 6 | 6 | 7 | 2 | 1 | 5 | 3 | 9 | 8 | 4 |
| | 7 | $\bar{8}^-$ | 3 | ī ī ⁻ | $\overline{4}^{-}$ | [6] | 9 | $\overline{7}$ | $\frac{1}{2}$ | $\begin{bmatrix} 5 \end{bmatrix}$ |
| | 8 | 5 - | 4 | $\bar{9}$ | 7 | 8 | $\frac{1}{2}$ | 1 | 6 | 3 |

| Col | \rightarrow | | | | | | | | |
|-----|--|---|---|--|--|--|--|--|--|
| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 0 | 1 | 5 | 7 | 6 | 3 | 4 | 8 | 9 | 2 |
| 1 | $\bar{2}^{-}$ | 18 | $\bar{4}$ | 9 | $\overline{7}$ | 5 | $\overline{3}$ | 1 | $\begin{bmatrix} -6 \end{bmatrix}$ |
| 2 | 3 - | 9 | $\bar{6}$ | 8 | $\lceil ar{2} \rceil$ | 1 | $\lceil 4 \rceil$ | 5 | $ ^{-7}$ |
| 3 | 4 | · 1 | ı <u>5</u> | 3 | 9 | 6 | 2 | · 7 | 8 |
| 4 | 7 - | 6 | $\lceil \bar{3} \rceil$ | $\overline{2}^{-}$ | $\lceil 1 \rceil$ | 8 | 5 | $\frac{1}{4}$ | 9 |
| 5 | 9 - | 2 | $\overline{8}$ | 5 | $\bar{4}$ | 7 | $\overline{6}$ | 3 | 1 |
| 6 | 6 | 7 | 2 | 1 | 5 | 3 | 9 | 8 | 4 |
| 7 | 8 - | 3 | - ī ⁻ | $\overline{4}^{-}$ | $\bar{6}$ | 9 | $^{-7}$ | $\frac{1}{2}$ | [5] |
| 8 | $\overline{5}^{-}$ | 4 | $\bar{9}^{-}$ | 7 | $\overline{8}$ | $\overline{2}^{-}$ | 1 | 6 | 3 |
| | $egin{array}{c} 0 \ 1 \ 2 \ 3 \ 4 \ 5 \ 6 \ 7 \ \end{array}$ | $\begin{array}{c cccc} 0 & 1 \\ \hline 1 & 2 \\ \hline 2 & 3 \\ \hline 3 & 4 \\ \hline 4 & 7 \\ \hline 5 & 9 \\ \hline 6 & 6 \\ \hline 7 & 8 \\ \hline \end{array}$ | $\begin{array}{c c c} & 0 & 1 \\ \hline 0 & \frac{1}{2} & \frac{5}{8} \\ \hline 2 & \frac{3}{3} & \frac{9}{9} \\ \hline 3 & \frac{4}{7} & \frac{1}{6} \\ \hline 5 & \frac{6}{9} & \frac{6}{12} \\ \hline 7 & 8 & \frac{3}{3} \\ \hline \end{array}$ | $\begin{array}{c c c c c c c c c c c c c c c c c c c $ | $\begin{array}{c c c c c c c c c c c c c c c c c c c $ | $\begin{array}{c c c c c c c c c c c c c c c c c c c $ | $\begin{array}{c c c c c c c c c c c c c c c c c c c $ | $\begin{array}{c c c c c c c c c c c c c c c c c c c $ | $\begin{array}{c c c c c c c c c c c c c c c c c c c $ |

| | Col | \rightarrow | | | | | | | | |
|----------------|----------------|---------------|---------------|---|--------------------|------------------------------|---------------|----------------|---------------|------|
| \mathbf{Row} | | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| \ | 0 | 1 | 5 | 7 | 6 | 3 | 4 | 8 | 9 | 2 |
| | 1 | $\bar{2}$ | 18 | $\bar{4}^-$ | 9 | $\lceil 7 \rceil$ | 5 | $\overline{3}$ | 1 | -6 |
| | 2 | 3 - | 9 | $\stackrel{\scriptscriptstyle{+}}{\scriptscriptstyle{1}}$ $\stackrel{\scriptscriptstyle{6}}{\scriptscriptstyle{6}}$ $\stackrel{\scriptscriptstyle{-}}{\scriptscriptstyle{1}}$ | 8 | $\lceil \bar{2} \rceil$ | 1 1 | $\overline{4}$ | $\frac{1}{5}$ | 7 |
| | 3 | 4 | · 1 | ı <u>5</u> | 3 | 9 | - 6 | 7 | · 2 | · 8 |
| | $\overline{4}$ | 7 - | 6 | $\lceil \bar{3} \rceil$ | $\overline{2}^{-}$ | $\lceil \overline{1} \rceil$ | 8 | 5 | [4] | [-9] |
| | 5 | 9 - | $\frac{1}{2}$ | $\overline{8}$ | $\overline{4}^{-}$ | $\overline{5}$ | 7 | $\overline{6}$ | 3 | 1 |
| | 6 | 6 | 7 | 2 | 1 | 4 | 3 | 9 | 8 | 5 |
| | 7 | 8 - | 3 | ī ī ⁻ | 5 | $\bar{6}$ | 9 | 2 | 7 - | 4 |
| | 8 | 5 | 4 | $\bar{9}^{-}$ | 7 | 8 | $\frac{1}{2}$ | 1 | 6 | 3 |

| _ | Col | \rightarrow | | | | | | | | |
|----------|-----|---------------|---------------|-------------------------|--------------------|-------------------------|---------------|-------------------|---------------|----------|
| Row | | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| \ | 0 | 1 | 5 | 7 | 6 | 3 | 4 | 8 | 9 | 2 |
| | 1 | $\bar{2}^{-}$ | ! 8 | $\bar{4}^-$ | 9 | $\lceil 7 \rceil$ | 5 | $\overline{3}$ | 1 | 6 |
| | 2 | $\bar{3}$ | 9 | $\bar{6}$ | 8 | $\lceil ar{2} \rceil$ | 11 | $\lceil 4 \rceil$ | 5 | $ ^{-7}$ |
| | 3 | 4 | · 1 | · 5 | 3 | ı 9 | - 6 | 7 | · 2 | 8 |
| | 4 | 7^{-} | 6 | $\lceil \bar{3} \rceil$ | $\frac{1}{2}$ | 「ī ⁻ | 8 | $\overline{5}$ | $\frac{1}{4}$ | 9 |
| | 5 | 9 - | $\frac{1}{2}$ | 8 - | 5 | $\overline{4}$ | 7 | $\overline{6}$ | 3 | 1 |
| | 6 | 6 | 7 | 2 | 1 | 5 | 3 | 9 | 8 | 4 |
| | 7 | $\bar{8}^-$ | 3 | $\bar{1}$ | $\overline{4}^{-}$ | [6] | 9 | 2^{-2} | 7 - | [5] |
| | 8 | $\bar{5}^{-}$ | ' 4 | $\bar{9}^{-}$ | 7 | $\lceil \bar{8} \rceil$ | $\frac{1}{2}$ | $\lceil 1 \rceil$ | 6 | 3 |

| | Col | \rightarrow | | | | | | | | |
|----------------|----------------|----------------|-----|-------------------------|--------------------|-------------------------|----------------|----------------|-------------------|-----|
| \mathbf{Row} | | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| \ | 0 | 1 | 5 | 7 | 6 | 3 | 4 | 8 | 9 | 2 |
| | 1 | $\bar{2}$ | 18 | $\bar{1} \bar{4}$ | 9 | Ī7 ⁻ | 5 | $\overline{3}$ | 1 | -6 |
| | 2 | $\bar{3}$ | -9 | $\frac{+6}{6}$ | 8 | $\lceil \bar{2} \rceil$ | 11 | $\overline{4}$ | $\frac{1}{5}^{-}$ | 7 |
| | 3 | 4 | · 1 | ı <u>5</u> | 3 | ı 9 | □ 6 | 7 | · 2 | · 8 |
| | $\overline{4}$ | 7 - | 6 | $\lceil \bar{3} \rceil$ | $\overline{2}^{-}$ | [[] | 18 | 5 | [4] | -9 |
| | 5 | $\bar{9}$ | 12 | $\bar{8}$ | 5 | $\bar{4}$ | $\overline{7}$ | $\overline{6}$ | 3 | 1 |
| | 6 | 6 | 7 | 9 | 1 | 5 | 3 | 2 | 8 | 4 |
| | 7 | 8 - | 3 | ī ī ⁻ | 4 | $\bar{6}$ | $\frac{1}{2}$ | 9 | 7 - | 5 |
| | 8 | $\overline{5}$ | 4 | $\bar{1}$ $\bar{2}$ | 7 | $\lceil 8 \rceil$ | 9 | 1 | 6 | 3 |
| | | | | | | | | | | |

$\mathbf{Col} \to$ \mathbf{Row} 3 | 4 | 5 6 7 | 8 \downarrow 1 2 3 4 5 6 8

| | Col | \rightarrow | | | | | | | | |
|-----|-----|---------------|-----|-------------------------------|--------------------|-------------------------|-------------------|-------------------|---------------|----------|
| Row | | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 4 | 0 | 1 | 5 | 7 | 6 | 3 | 4 | 8 | 9 | 2 |
| | 1 | $\bar{2}$ | ! 8 | $\bar{1}$ $\bar{4}$ $\bar{4}$ | 9 | - 7 - | 5 | $\overline{3}$ | 1 | 6 |
| | 2 | 3 - | 9 | $\frac{1}{6}$ | 8 | $\lceil \bar{2} \rceil$ | 1 1 | $\lceil 4 \rceil$ | 5 | $ ^{-7}$ |
| | 3 | 5 | · 1 | · 3 | 4 | 9 | - 6 | 7 | · 2 | 8 |
| | 4 | 7 - | 6 | $\lceil \bar{2} \rceil$ | 3 | [ī - | 8 | $\overline{5}$ | $\frac{1}{4}$ | 9 |
| | 5 | 9 - | 4 | ī 8 - | $\overline{2}^{-}$ | $\bar{5}$ | 7 | $\overline{6}$ | 3 | 1 |
| | 6 | 6 | 7 | 9 | 1 | ¦ 4 | 3 | 2 | 8 | 5 |
| | 7 | 8 - | 3 | - ī - | 5 | $\bar{6}^{-}$ | $\frac{1}{2}^{-}$ | 9 - | 7 - | 4 |
| | 8 | $ar{4}^-$ | 2 | $\bar{5}$ | 7 | $\lceil 8 \rceil$ | 9 | 1 | 6 | 3 |

| | Col | \rightarrow | | | | | | | | |
|----------------|----------------|---------------|---------------|-------------------------|--------------------|-------------------------|---------------|----------------|-----------------------------|------|
| \mathbf{Row} | | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| \ | 0 | 1 | 5 | 7 | 6 | 3 | 4 | 8 | 9 | 2 |
| | 1 | $\bar{2}$ | 18 | $\bar{4}^-$ | 9 | $\lceil ar{7} \rceil$ | 5 | $\overline{3}$ | 1 | -6 |
| | 2 | $\bar{3}$ | 9 | $\frac{+}{6}$ $\bar{6}$ | 8 | $\lceil \bar{2} \rceil$ | 1 1 | $\overline{4}$ | 7 - | 5 |
| | 3 | 4 | · 1 | · 3 | 2 | - 9 | - 6 | 7 | ı <u>5</u> | · 8 |
| | $\overline{4}$ | 7 - | 6 | $\lceil \bar{5} \rceil$ | 3 | [ī- | 8 | $\overline{2}$ | [4] | [-9] |
| | 5 | 9 - | $\frac{1}{2}$ | $\overline{8}$ | 5 | $\bar{4}$ | 7 | $\overline{6}$ | 3 | 1 |
| | 6 | 6 | 7 | 2 | 1 | 5 | 3 | 9 | 8 | 4 |
| | 7 | 8 - | 3 | $\bar{1}$ | $\overline{4}^{-}$ | [6] | 9 | $\overline{5}$ | $\frac{1}{1}$ $\frac{1}{2}$ | 7 |
| | 8 | 5 | 4 | $\bar{9}^{-}$ | 7 | $\lceil 8 \rceil$ | $\frac{1}{2}$ | 1 | 6 | 3 |

$Col \rightarrow$ Row $3 \mid 4 \mid$ 7 1 5 6 \downarrow ____2 7 3 5 6 4 8 $\frac{1}{9}$ 0 $\frac{1}{9}$ $\frac{1}{7}$ $\frac{1}{7}$ $\frac{1}{5}$ $\frac{1}{3} + \frac{1}{1} + \frac{1}{1} = \frac{1}{6}$ $\bar{2}^{-1} - 8^{-1} - \bar{4}$ 1 ¬ --1-9-+ $\frac{1}{8}$ $\frac{1}{2}$ 2 $\bar{6}$ $\overline{4}$ 2 | 9 | 6 3 4 + 1 ı <u>5</u> 7 + 3 ⊥ 8 $\bar{5}$ 4 - 9 -1-6 7.8 $\bar{7}$ $\bar{2}$ 5 4 6 5 $\bar{9}$ ---2 $\bar{1}8$ $\bar{1}4$ $\frac{1}{1} \cdot \frac{5}{5} \cdot 1 \cdot 1$ 3 - + 1 1 6 6 1 5 3 9 $\frac{3}{9}$ $-\frac{9}{5} + \frac{8}{2} - \frac{4}{7}$ _ _ $\frac{6}{8}$ $\frac{-1}{3}$ 7 **4** | 6 $\frac{5}{5} - \frac{1}{4} - \frac{1}{9} = \frac{5}{9}$ $7^{-\frac{1}{8}} \frac{8}{1} \frac{1}{2}$ 1 - 6 - 3 8

 $\operatorname{Col} \to$ Row 3 | 4 | 5 0 1 $\mathbf{2}$ 6 7 \downarrow $\frac{8}{3} + \frac{9}{1} - \frac{2}{6}$ 5 0 $\frac{1}{2} - \frac{1}{8} - \frac{1}{4}$ 1 7.1 $\frac{3}{8} - \frac{1}{2}$ $\frac{3}{4} + \frac{1}{7} - \frac{3}{1} - \frac{5}{5}$ $\bar{3}^{-1} - 9^{-} + \bar{6}$ 2 3 4 + 1 + 53 | 9 | 6 7 | 2 | 8 7 -1-6 $\lceil \bar{3} \rceil$ 1 7 8 5 7 4 7 9 4 18 $\bar{1}4$ $\frac{1}{2}$ $\sqrt{7}$ 6 5 $\bar{9}$ 5 $\frac{9}{2} + \frac{8}{5} + \frac{4}{7}$ 6 5 1 3 $\frac{3}{9}$ 6 7 $^{-4}^{-}$ $\frac{1}{7} - \frac{1}{8} = \frac{1}{2}$ $\frac{1}{1} + \frac{1}{6} + \frac{1}{3}$ 8

Row

 \downarrow

 $Col \rightarrow$ 0 1 $\mathbf{2}$ 3 | 4 | 5 6 7 | 8 3 5 7 6 2 $\frac{6}{9} - \frac{1}{7} = \frac{7}{5}$ $\frac{3}{3} + \frac{1}{1} - \frac{2}{6}$ $\frac{1}{2} - \frac{1}{8} - \frac{1}{4}$ - <u>-</u> - 2 $^{\dashv}$ $\bar{1}$ $\bar{3}$ -1-9-+ $\bar{6}$ 8 $\bar{4}$ 3 1 5 $\frac{3}{3} + 9 + 6$ 4 + 1 $\begin{bmatrix} 1 \\ 1 \end{bmatrix} \begin{bmatrix} 8 \\ 7 \end{bmatrix}$ 4 $\overline{2}$ _ L 5 5 2 6 6 9 1 5 3 $-\frac{1}{3} + \frac{9}{1}$ $+\frac{6}{5} - 1 - \frac{4}{7}$ $\frac{\overline{8}}{\overline{5}}$ $\frac{1}{1}$ $\bar{6}$ 9 7 $\overline{4}^{-}$ $7^{-\frac{1}{8}} = \frac{1}{9}$ 1 - 6 - 3

| Col | \rightarrow | | | | | | | | |
|-----|--|--|--|--|--|--|--|--|--|
| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 0 | 1 | 5 | 7 | 6 | 3 | 4 | 9 | 8 | 2 |
| 1 | $\bar{2}^{-}$ | 4 | · 8 - | 9 | 7 | 5 | 3 | 1 | $\begin{bmatrix} -6 \end{bmatrix}$ |
| 2 | 3 - | -9 | $\frac{+}{6}$ $^{-}$ | 8 | $\lceil \bar{2} \rceil$ | 1 | $\overline{4}$ | 5 | 7 |
| 3 | 4 | · 1 | · 3 | 2 | 9 | 6 | 5 | · 7 | 8 |
| 4 | 7 - | 6 | $\lceil \bar{5} \rceil$ | 3 | $\lceil 1 \rceil$ | 8 | 2 | $\frac{1}{4}$ | 9 |
| 5 | 9 - | 18 | $\bar{2}$ | $\overline{4}^{-}$ | $\overline{5}$ | 7 | $\overline{6}$ | 3 | 1 |
| 6 | 6 | 7 | 9 | 1 | 4 | 3 | 8 | 2 | 5 |
| 7 | 8 - | 3 | - ī ⁻ | 5 | $\bar{6}$ | $\overline{2}^{-}$ | $^{-7}^{-}$ | 9 - | 4 |
| 8 | $\overline{5}^{-}$ | 2 | $\bar{4}^-$ | 7 | $\overline{8}$ | 9 | $1 \overline{1}$ | 6 | 3 |
| | $egin{array}{c} 0 \ 1 \ 2 \ 3 \ 4 \ 5 \ 6 \ 7 \ \end{array}$ | $\begin{array}{c cccc} 0 & \frac{1}{2} \\ \hline 1 & \frac{2}{3} \\ \hline 2 & \frac{3}{3} \\ \hline 3 & \frac{4}{7} \\ \hline 5 & \frac{6}{9} \\ \hline 6 & \frac{6}{8} \\ \hline 7 & \frac{8}{3} \\ \end{array}$ | $\begin{array}{c c c} & 0 & 1 \\ \hline 0 & \frac{1}{2} - \frac{5}{4} \\ \hline 2 & \frac{3}{3} - \frac{9}{9} \\ \hline 3 & \frac{4}{7} - \frac{6}{6} \\ \hline 5 & 9 & 8 \\ \hline 6 & \frac{6}{8} - \frac{7}{7} \\ \hline 7 & 8 & 3 \\ \hline \end{array}$ | $\begin{array}{c c c c c c c c c c c c c c c c c c c $ | $\begin{array}{c c c c c c c c c c c c c c c c c c c $ | $\begin{array}{c c c c c c c c c c c c c c c c c c c $ | $\begin{array}{c c c c c c c c c c c c c c c c c c c $ | $\begin{array}{c c c c c c c c c c c c c c c c c c c $ | $\begin{array}{c c c c c c c c c c c c c c c c c c c $ |

| _ | Col | \rightarrow | | | | | | | | |
|----------|-----|-------------------------|-----|---|---|-----------------------------------|---------------|-----------------------------------|--------------------|-----------------------------------|
| Row | | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| \ | 0 | 1 | 5 | 7 | 6 | 3 | 4 | 9 | 8 | 2 |
| | 1 | $\bar{2}$ | 4 | <u>-</u> 8 - | 9 | $\lceil ar{7} \rceil$ | 5 | $\overline{3}$ | 1 | [6] |
| | 2 | $\bar{3}$ | 1-9 | $\stackrel{\scriptscriptstyle{+}}{\scriptscriptstyle{1}}$ $\stackrel{\scriptscriptstyle{6}}{\scriptscriptstyle{6}}$ $\stackrel{\scriptscriptstyle{-}}{\scriptscriptstyle{1}}$ | 8 | $\lceil \bar{2} \rceil$ | 1 1 | $\overline{4}$ | $\frac{1}{5}^{-}$ | 7 |
| | 3 | 4 | · 1 | · 3 | 2 | - 9 | - 6 | 5 | 7 | · 8 |
| | 4 | 7 - | 6 | $\lceil \bar{5} \rceil$ | 3 | [ī ī | 8 | 2^{-2} | [4] | [-9] |
| | 5 | $\lceil \bar{9} \rceil$ | 18 | $\bar{2}^{-}$ | 5 | $\bar{4}$ | 7 | $\begin{bmatrix} 6 \end{bmatrix}$ | $\overline{3}^{-}$ | 1] |
| | 6 | 6 | 7 | 9 | 1 | 5 | 3 | 8 | 2 | 4 |
| | 7 | $\bar{8}^{-}$ | 3 | īī ⁻ | 4 | $\begin{bmatrix} 6 \end{bmatrix}$ | $\frac{1}{2}$ | $\lceil 7 \rceil$ | 9 | $\begin{bmatrix} 5 \end{bmatrix}$ |
| | 8 | 5 | 2 | [4] | 7 | 8 | 9 | 1 | 6 | _3_ |

| 3 |
|---|
| 2 |
| ; |
| 7 |
| 3 |
|) |
| |
| 5 |
| [|
| 3 |
| |

| _ | Col | \rightarrow | | | | | | | | |
|----------|-----|-------------------------|-----|-------------------------------|--------------------|-------------------------|---------------|-----------------------------------|---|-----------------------------------|
| Row | | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| \ | 0 | 1 | 5 | 7 | 6 | 3 | 4 | 9 | 8 | 2 |
| | 1 | $\bar{2}^{-}$ | 4 | ī <u>8</u> - | 9 | - 7 - | 5 | 3 | 1 | · ⁻ 6 |
| | 2 | $\bar{3}$ | -9 | $\frac{+6}{6}$ | 8 | $\lceil \bar{2} \rceil$ | 11 | $\overline{4}$ | $\frac{1}{1} \frac{1}{5} \frac{1}{5}$ | [7] |
| | 3 | 4 | · 1 | ı <u>5</u> | 3 | ı 9 | ∟6 | 2 | · 7 | · 8 |
| | 4 | $\bar{7}^{-}$ | 6 | $\lceil ar{3} \rceil$ | $\overline{2}^{-}$ | [1 | 8 | $\lceil 5 \rceil$ | $\begin{bmatrix} -4 \end{bmatrix}$ | [9] |
| | 5 | $\lceil \bar{9} \rceil$ | 18 | $\bar{1}$ $\bar{2}$ $\bar{2}$ | 5 | $\bar{1}$ $\bar{4}$ | 7 | $\begin{bmatrix} 6 \end{bmatrix}$ | $\overline{3}^{-}$ | $\begin{bmatrix} 1 \end{bmatrix}$ |
| | 6 | 6 | 7 | 19 | 1 | 5 | 1 3 | 8 | $\frac{1}{1}$ 2 | 4 |
| | 7 | $\bar{8}^-$ | 3 | $\bar{1}$ | 4^{-} | $\overline{6}$ | $\frac{1}{2}$ | $\lceil 7 \rceil$ | 9 | $\begin{bmatrix} 5 \end{bmatrix}$ |
| | 8 | $\overline{5}$ | 12 | $\lceil \overline{4} \rceil$ | 7 | [8] | 9 | 1 | 6 | 3 |

$\mathbf{Col} \to$ $\mathop{\bf Row}_{\downarrow}$ 3 | 4 | 5 6 | 7 | 8 1 2 3 4 5 6 8

| | Col | \rightarrow | | | | | | | | |
|----------|-----|--------------------|-----|-------------------------|--------------------|-------------------------|--------------------|------------------|---------------|---------------------------------|
| Row | | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| + | 0 | 1 | 5 | 7 | 6 | 3 | 4 | 9 | 8 | 2 |
| | 1 | $\bar{2}^{-}$ | 4 | ī 8 - | 9 | $\overline{7}$ | 5 | $\overline{3}$ | 1 | · 6 |
| | 2 | 3 - | -9 | $\frac{+}{6}$ $^{-}$ | 8 | $\lceil \bar{2} \rceil$ | 1 | $\overline{4}$ | 5 | ¦ ⁻ 7 ⁻ 1 |
| | 3 | 5 | · 1 | ı 4 | 3 | 9 | 6 | 2 | · 7 | · 8 |
| | 4 | 7 - | 6 | $\lceil \bar{3} \rceil$ | 2 | $\lceil 1 \rceil$ | 8 | 5 | $\frac{1}{4}$ | -9 |
| | 5 | 9 - | 8 | $\bar{2}$ | $\overline{4}^{-}$ | $\overline{5}$ | 7 | $\overline{6}$ | 3 | 1^{-1} |
| | 6 | 6 | 7 | 9 | 1 | 4 | 3 | 8 | 2 | 5 |
| | 7 | 8 - | 3 | - ī - | 5 | $\bar{6}$ | $\overline{2}^{-}$ | $^{-7}^{-}$ | 9 - | 4 |
| | 8 | $\overline{4}^{-}$ | 2 | $\bar{5}$ | 7 | $\overline{8}$ | 9 | $1 \overline{1}$ | 6 | |

| | Col | \rightarrow | | | | | | | | |
|----------------|----------------|---------------|-----|-------------------------|--------------------|---------------------------|---------------|-------------------|------------------------------------|---------------------------------|
| \mathbf{Row} | | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| + | 0 | 1 | 5 | 7 | 6 | 3 | 4 | 9 | 8 | 2 |
| | 1 | $\bar{2}^{-}$ | 4 | 8 - | 9 | $\lceil 7 \rceil$ | 5 | $\overline{3}$ | 1 | · ⁻ 6 |
| | 2 | $\bar{3}$ | ¦_9 | $\frac{1}{6}^{-}$ | 8 | $\lfloor \bar{2} \rfloor$ | 1 1 | $\overline{4}$ | 5 | ¦ ⁻ 7 ⁻] |
| | 3 | 5 | · 1 | ı 4 | 3 | - 9 | - 6 | 2 | 7 | · 8 |
| | $\overline{4}$ | 7 - | 6 | $\lceil \bar{3} \rceil$ | $\overline{2}^{-}$ | [ī- | 8 | $\overline{5}$ | $\begin{bmatrix} -4 \end{bmatrix}$ | [9] |
| | 5 | $\bar{9}$ | 8 | $\bar{2}$ | 5 | $\bar{4}$ | 7 | $\overline{6}$ | $\overline{3}^{-}$ | 1^{-1} |
| | 6 | 6 | 7 | 9 | 1 | 5 | 3 | 8 | 2 | 4 |
| | 7 | $\bar{8}^-$ | 3 | $\bar{1}$ | 4 | [6] | $\frac{1}{2}$ | $\overline{7}$ | 9 - | 5 |
| | 8 | $\bar{4}^-$ | 12 | $\bar{5}$ | 7 | [8] | 9 | $\lceil 1 \rceil$ | 6 | -3 |
| | | | | | | | | | | |

| Col | \rightarrow | | | | | | | | |
|-----|--|--|--|--|--|--|--|--|--|
| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 0 | 1 | 5 | 7 | 6 | 3 | 4 | 9 | 8 | 2 |
| 1 | $\bar{2}^{-}$ | 4 | 8 - | 9 | $\overline{7}$ | 5 | $\overline{3}$ | 1 | $\begin{bmatrix} -6 \end{bmatrix}$ |
| 2 | 3 - | -9 | $\bar{6}$ | 8 | $\lceil \bar{2} \rceil$ | 1 | $\overline{4}$ | 7 - | 5 |
| 3 | 4 | · 1 | · 2 | 5 | 9 | 6 | 7 | · 3 | 8 |
| 4 | 7 - | 6 | $\lceil \bar{5} \rceil$ | 3 | $\lceil 1 \rceil$ | 8 | 2 | $\frac{1}{4}$ | 9 |
| 5 | 9 - | 18 | $\bar{3}$ | $\overline{2}^{-}$ | $\bar{4}$ | 7 | $\overline{6}$ | 5 | 1 |
| 6 | 6 | ¦ 7 | 9 | 1 | 5 | 3 | 8 | 2 | 4 |
| 7 | 8 - | 3 | - ī - | $\overline{4}^{-}$ | $\bar{6}$ | $\overline{2}^{-}$ | _5 | 9 - | 7 |
| 8 | $\overline{5}$ | 2 | $\bar{4}^-$ | 7 | $\overline{8}$ | 9 | 1 | 6 | 3 |
| | $egin{array}{c} 0 \ 1 \ 2 \ 3 \ 4 \ 5 \ 6 \ 7 \ \end{array}$ | $\begin{array}{c cccc} 0 & \frac{1}{2} \\ \hline 1 & \frac{2}{3} \\ \hline 2 & \frac{3}{3} \\ \hline 3 & \frac{4}{7} \\ \hline 5 & \frac{6}{9} \\ \hline 6 & \frac{6}{8} \\ \hline 7 & \frac{8}{3} \\ \end{array}$ | $\begin{array}{c c c} & 0 & 1 \\ \hline 0 & \frac{1}{2} - \frac{5}{4} \\ \hline 2 & \frac{3}{3} - \frac{9}{9} \\ \hline 3 & \frac{4}{7} - \frac{6}{6} \\ \hline 5 & 9 & 8 \\ \hline 6 & \frac{6}{8} - \frac{7}{7} \\ \hline 7 & 8 & 3 \\ \hline \end{array}$ | $\begin{array}{c c c c c c c c c c c c c c c c c c c $ | $\begin{array}{c c c c c c c c c c c c c c c c c c c $ | $\begin{array}{c c c c c c c c c c c c c c c c c c c $ | $\begin{array}{c c c c c c c c c c c c c c c c c c c $ | $\begin{array}{c c c c c c c c c c c c c c c c c c c $ | $\begin{array}{c c c c c c c c c c c c c c c c c c c $ |

| | Col | \rightarrow | | | | | | | | |
|----------------|-----|---------------|-----|---|---|---------------------------|---------------|-----------------------------------|-----------------|-----|
| \mathbf{Row} | | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| \ | 0 | 1 | 5 | 7 | 6 | 3 | 4 | 9 | 8 | 2 |
| | 1 | $\bar{2}^{-}$ | 4 | <u>-</u> 8 - | 9 | $\bar{}7$ | 5 | $\overline{3}$ | 1 | ·_6 |
| | 2 | $\bar{3}$ | 19 | $\stackrel{\scriptscriptstyle{+}}{\scriptscriptstyle{1}}$ $\stackrel{\scriptscriptstyle{6}}{\scriptscriptstyle{6}}$ $\stackrel{\scriptscriptstyle{-}}{\scriptscriptstyle{1}}$ | 8 | $\lfloor \bar{2} \rfloor$ | 1 1 | $\overline{4}$ | 7 - | 5 |
| | 3 | 4 | · 1 | · 3 | 2 | ı 9 | - 6 | 7 | ı <u>5</u> | · 8 |
| | 4 | 7 - | 6 | $\lceil \bar{5} \rceil$ | 3 | [1 | 8 | $\overline{2}$ | [4] | -9 |
| | 5 | $\frac{1}{9}$ | 8 | $\bar{2}$ | 5 | $\bar{4}$ | 7 | $\begin{bmatrix} 6 \end{bmatrix}$ | 3 | 1 |
| | 6 | 6 | 7 | 9 | 1 | 5 | 3 | 8 | $\frac{1}{1}$ 2 | 4 |
| | 7 | $\bar{8}^-$ | 3 | īī ⁻ | 4 | $\overline{6}$ | $\frac{1}{2}$ | $\lceil 5 \rceil$ | 9 | [7] |
| | 8 | 5 | 2 | $\lfloor 4 \rfloor$ | 7 | 8 | 9 | 1 | 6 | [3] |

 $Col \rightarrow$ Row $3 \mid 4 \mid$ 1 5 6 7 \downarrow 3 2 5 8 6 4 9 0 $\frac{1}{9}$ $\frac{1}{7}$ $\frac{1}{7}$ $\frac{1}{5}$ $\frac{1}{3} + \frac{1}{1} + \frac{1}{6} = \frac{1}{6}$ $\frac{1}{2} - \frac{1}{4} - \frac{1}{8} = \frac{1}{8}$ 1 ¬ --1-9- + $-\vdash \bar{2}$ 2 $\bar{6}$ $\overline{4}$ 8 2 | 9 | 6 3 4 | 1 ı <u>5</u> 7 + 3 ı 8 4 - 9 -,-6 $\bar{5}$ $\frac{7}{8}$ $\begin{bmatrix} 2 & 1 \\ 6 & 1 \end{bmatrix}$ $\bar{7}$ 5 4 $\bar{9}$ $\bar{2}$ $\bar{1}4$ $\frac{1}{1} \cdot \frac{5}{5} \cdot 1 \cdot 1$ 5 -i-8 3 6 6 9 1 5 3 8 $\frac{8}{5} + \frac{2}{9} + \frac{4}{7}$ $\frac{1}{1}\frac{3}{2}$ _ _ $\frac{6}{8}$ $\frac{-1}{3}$ _ + 7 $\bar{1}$ **4** | 6 $\frac{5}{5} - \frac{1}{2} - \frac{1}{4} = \frac{7}{4}$ 7--8-19 1 - 6 - 3 8

 $\operatorname{Col} \to$ Row 3 | 4 | 5 0 1 $\mathbf{2}$ 6 7 \downarrow $\frac{9}{3} + \frac{8}{1} - \frac{2}{6}$ 5 $\frac{1}{2} - \frac{1}{4} - \frac{1}{8} = \frac{1}{8}$ 1 7.1 $\frac{3}{8} - \frac{1}{2}$ $\frac{1}{4} + \frac{1}{7} - \frac{1}{5}$ $\bar{3}^{-1} - 9^{-} + \bar{6}$ 2 3 5 + 1 + 42 | 9 | 6 7 | 3 | 8 7 -1-6 1 7 8 $\bar{3}$ 5 $\bar{2}$ 7 4 - 1 - 9 4 6 i_8 $\bar{1}4$ $\overline{2}$ $\sqrt{7}$ $\frac{1}{1} \frac{1}{5}$ 5 $\bar{9}$ 3 + 2 -6 5 8 1 3 $\frac{1}{2}$ 6 5 7 $^{-4}^{-}$ $\frac{1}{7}$ $\frac{1}{1} + \frac{1}{6} + \frac{1}{3}$ 8

 $Col \rightarrow$ Row 7 | 8 0 1 $\mathbf{2}$ 3 | 4 | 5 6 \downarrow 3 $\frac{1}{5}$ 6 2 $-\frac{9}{3} \mid \frac{8}{1} \mid \frac{2}{6}$ $\frac{6}{9} - \frac{1}{7} = \frac{7}{5}$ $\bar{2}^{-1}4^{-1}8$ $^{\dashv}$ $\bar{1}$ -i-9- + <u>3</u> - <u>- -</u> ⁺ 5 $\bar{6}$ $\overline{\mathbf{2}}$ 8 $\overline{4}$ 3 3 12 4 | 9 | 6 + 1 $\begin{bmatrix} 2 & 1 & 4 & 1 & 9 \\ 2 & 1 & 3 & 1 & 1 \end{bmatrix}$ $\frac{1}{7} - \frac{1}{6} - \frac{1}{5} = \frac{5}{5}$ $\begin{bmatrix} 3 & 1 \\ 2 & 5 \end{bmatrix}$ 7.8 4 2- $\bar{4}$ $\bar{1}$ $\bar{9}$ $\sqrt{7}$ 5 ı 8 8 $^{\mathsf{T}}$ 2 6 9 6 1 4 3 7 + $\frac{9}{8} - \frac{7}{12} - \frac{1}{4} = \frac{0}{12}$ $\frac{1}{9} - \frac{3}{4}$ $\frac{1}{1}\frac{5}{2}$ 5 6 7 $7^{-\frac{1}{8}} = \frac{1}{9}$ 1 - 6 - 3

 $Col \rightarrow$ Row $3 \mid 4 \mid$ 7 1 **5** 6 \downarrow 7 3 2 5 8 6 4 9 $\mathbf{0}$ $\frac{1}{9}$ $\frac{1}{7}$ $\frac{1}{7}$ $\frac{1}{5}$ $\frac{1}{3} + \frac{1}{1} + \frac{1}{6} = \frac{1}{6}$ $\frac{1}{2} - \frac{1}{4} - \frac{1}{8} = \frac{1}{8}$ 1 ¬ --i-9- + 3 - $\frac{1}{2}$ $\bar{6}$ 2 $\overline{4}$ 8 3 5 + 9 + 6 $\overline{2}$ 3 | 1 ı 4 + 7 ı 8 $\begin{bmatrix} \frac{7}{2} \\ \frac{1}{9} \end{bmatrix}$ $\overline{4}$ -1-6 - <u>-</u> <u>-</u> <u>-</u> 5 $\bar{7}$ 8 4 -3 $\frac{1}{3} \frac{4}{1} \frac{-1}{1} \frac{9}{1}$ $\overline{5}$ 2 $\bar{1}4$ 6 5 -i-8 6 9 7 6 1 5 3 $\frac{1}{1}\frac{3}{2}$ _ _ _ + 7 -|-3 $\bar{1}$ **4** | 6 $-\frac{1}{2} - \frac{1}{1} = \frac{1}{5}$ 7--8-19 $\overline{4}$ 8

 $\operatorname{Col} \to$ Row 3 | 4 | 5 0 1 $\mathbf{2}$ 6 7 \downarrow $\overline{5}$ 0 -1-4- 1-8 $\bar{2}$ 1 7.1 $\frac{3}{8} - \frac{1}{2}$ $\frac{3}{4} + \frac{1}{5} - \frac{3}{7}$ 6 -1-9- + 3 2 3 3 + 1 + 54 | 9 | 6 2 | 7 | 8 $\begin{bmatrix} -1 & -6 & \pm \frac{1}{2} \\ -1 & 8 & \pm \frac{9}{9} \end{bmatrix}$ - T 5 -1-6 7.8 $\bar{7}$ 7 4 - 1 - 9 4 3 $\frac{1}{5}$ 2 $\sqrt{7}$ $\frac{1}{1} \frac{1}{3}$ 5 $\bar{4}$ 6 6 1 4 3 $\frac{3}{1}$ 6 7 5 $\frac{1}{7} - \frac{1}{8} = \frac{1}{9}$ 8

Row

 \downarrow

 $Col \rightarrow$ 0 1 $\mathbf{2}$ 3 | 4 | 5 6 7 | 8 3 5 7 6 9 2 $-\frac{9}{3} \mid \frac{8}{1} \mid \frac{2}{6}$ $\frac{3}{9} - \frac{1}{7} = \frac{7}{5}$ $\bar{2}^{-1}4^{-1}8$ $^{\dashv}$ $\bar{1}$ - <u>- -</u> <u>-</u> -|-9- + 3 $\overline{6}$ $\overline{\mathbf{2}}$ -8 $\overline{4}$ 3 12 5 + 9 + 6 4 + 1 + 3 + 8 $\begin{bmatrix} 2 & 7 & 4 & -1 & 9 \\ -6 & 1 & 5 & 1 & 1 \end{bmatrix}$ 7 - 6 7.8 4 -3 _ _ _ L $\bar{3}$ $\bar{1}$ $\bar{9}$ $\bar{2}^{-}$ $\bar{1}4$ 5 ı 8 1 6 9 6 5 3 8 2 1 $\frac{1}{1} \frac{2}{9} \frac{1}{1} \frac{4}{7}$ $\frac{\overline{8}}{\overline{5}}$ $-\frac{1}{3} - \frac{1}{4}$ $\frac{1}{1}$ 5 $\bar{6}$ 7 $\overline{4}^{-}$ $7^{-\frac{1}{8}} = \frac{1}{9}$ 1 - 6 - 3

 $Col \rightarrow$ Row $3 \mid 4 \mid$ 1 5 6 7 \downarrow 7 3 2 5 8 6 4 9 0 $\frac{1}{9}$ $\frac{1}{7}$ $\frac{1}{7}$ $\frac{1}{5}$ $\frac{1}{3} + \frac{1}{1} + \frac{1}{6} = \frac{1}{6}$ $\bar{2}^{-1} - 8^{-1} - \bar{4}$ 1 7.7 -1-9-+ $-\vdash \bar{2}$ 2 $\bar{6}$ $\overline{4}$ 8 $\frac{5}{2}$ $\frac{7}{4}$ $\frac{8}{9}$ 3 4 + 1 3 2 + 9 + 6 - 1 $\begin{bmatrix} 7 & \overline{5} \\ 1 & \overline{8} \end{bmatrix}$ -1-6 T 1 $\frac{2}{6}$ $\bar{7}$ 3 8 4 $\frac{1}{3} \frac{4}{1} \frac{1}{1}$. L <u>-</u> . 5 $\bar{9}$ ---2 5 $\overline{4}$ 6 6 2 1 4 3 - + = - ⊢ 4. **-** 9 7 73 5 6 $\frac{5}{5} - \frac{1}{4} - \frac{1}{9} = \frac{5}{9}$ $\frac{1}{7}$ 8

 $\operatorname{Col} \to$ Row 3 | 4 | 5 0 1 $\mathbf{2}$ 6 7 \downarrow $\frac{9}{3} + \frac{8}{1} - \frac{2}{6}$ $\overline{5}$ $\frac{1}{2} - \frac{1}{8} - \frac{1}{4}$ 1 7.1 $\frac{3}{8} - \frac{1}{2}$ $\bar{3}^{-1} - 9^{-} + \bar{6}$ [†] ⁵ 2 $\overline{4}$ 3 4 + 1 + 32 | 9 | 6 5 | 7 | 8 † 5 7 -1-6 1 7 8 $\bar{2}$ 7 4 - 1 - 9 3 4 5 6 18 $\frac{1}{2}$ $\sqrt{7}$ $\frac{1}{1} \frac{1}{3}$ 5 $\bar{9}$ 4 6 1 4 3 $\frac{3}{1}$ 5 L 6 7 $\frac{1}{7} - \frac{1}{8} = \frac{1}{9}$ 8

Row

 \downarrow

 $Col \rightarrow$ 1 | 7 | 8 0 $\mathbf{2}$ 3 | 4 | 5 6 3 5 7 6 2 $-\frac{9}{3} \mid \frac{8}{1} \mid \frac{2}{6}$ $\frac{6}{9} - \frac{1}{7} = \frac{7}{5}$ $\frac{1}{2} - \frac{1}{8} - \frac{1}{4}$ $^{\dashv}$ $\bar{1}$ - <u>- -</u> <u>-</u> $\bar{3}$ -1-9-+ ⁺ 5 $\bar{6}$ $\overline{\mathbf{2}}$ 8 $\overline{4}$ 3 + 3 2 + 9 + 6 4 + 1 $\begin{bmatrix} 2 & 1 & 4 & 1 & 9 \\ 2 & 1 & 3 & 1 & 1 \end{bmatrix}$ 7.8 4 3 _ L $\bar{1}4$ 5 5 1 ½ 1 1 8 6 1 5 3 9 $\begin{bmatrix}
 8 & 1 & 9 & 1 & 4 \\
 7 & 1 & 2 & 1 & 5 \\
 1 & 6 & 1 & 3
 \end{bmatrix}$ $\frac{1}{1} = \frac{9}{9}$ $\bar{6}$ 7 $\overline{4}^{-}$ $7^{-\frac{1}{1}}\frac{8}{8}$ $\overline{}$

 $Col \rightarrow$ Row $3 \mid 4 \mid$ 7 1 **5** 6 \downarrow 7 3 2 5 8 6 4 9 $\mathbf{0}$ $\frac{1}{9}$ $\frac{1}{7}$ $\frac{1}{7}$ $\frac{1}{5}$ $\frac{1}{3} + \frac{1}{1} + \frac{1}{6} = \frac{1}{6}$ $\bar{2}^{-1} - 8^{-1} - \bar{4}$ 1 ¬ --1-9-+ $-8^{-} - \frac{7}{2}$ 2 $\bar{6}$ $\overline{4}$ 3 +9+6 4 + 1 3 2 5 + 7 ı 8 - 1 7 4 -1-9 -1-6 $^{\mathsf{T}}_{\mathsf{L}}\bar{\mathbf{5}}$ $\bar{7}$ $\bar{2}$ 8 4 -3 $\frac{1}{3} \frac{4}{1} \frac{-1}{1} \frac{9}{1}$ 6 5 $\bar{9}$ ---2 $\bar{1}8$ $\bar{1}4$ 5 6 6 9 1 5 3 $\frac{1}{1}\frac{3}{2}$ _ _ _ + -₁-3- $\bar{1}$ 7 **4** | 6 1 $\frac{1}{5} = \frac{1}{4} = \frac{1}{4}$ 7--8-19 $\bar{2}$ 8

 $\operatorname{Col} \to$ Row 3 | 4 | 5 0 1 $\mathbf{2}$ 6 7 \downarrow $\overline{5}$ 0 $\frac{1}{2} - \frac{1}{8} - \frac{1}{4}$ 1 7.1 $\frac{3}{8} - \frac{1}{2}$ $\frac{3}{4} + \frac{1}{5} - \frac{3}{7}$ $\bar{3}^{-1} - 9^{-} + \bar{6}$ 2 3 4 + 1 + 53 | 9 | 6 2 | 7 | 8 5 7 4 9 7 -1-6 1 7 8 $\bar{3}$ 2 4 5 $\frac{1}{2}$ $\bar{1}8$ $\sqrt{7}$ 5 $\bar{9}$ 4 6 $\overline{}$ $\overline{}$ 6 1 4 3 $\frac{3}{9}$ 5 L 6 7 7--8--2 8

 $Col \rightarrow$ Row $1 \mid 2$ 0 3 | 4 | 5 6 7 | 8 \downarrow 3 5 7 6 9 2 $-\frac{9}{3} \mid \frac{8}{1} \mid \frac{2}{6}$ $\frac{3}{9} - \frac{1}{7} = \frac{7}{5}$ $\frac{1}{2} - \frac{1}{8} - \frac{1}{4}$ - <u>- -</u> $\stackrel{\dashv}{\cdot}$ $\stackrel{-}{1}$ + 5 - 1 - 7 $\bar{3}$ -1-9-+ $\bar{6}$ $\overline{\mathbf{2}}$ -8 $\overline{4}$ 3 1 5 $\frac{3}{3} + 9 + 6$ $\frac{1}{2}$ | 7 4 + 1 $\begin{bmatrix} 2 & 1 & 3 & 8 \\ 4 & 5 & 7 \end{bmatrix}$ $\begin{bmatrix} \frac{2}{5} & \frac{1}{4} & \frac{1}{9} \\ \frac{6}{6} & \frac{1}{3} & \frac{1}{1} \end{bmatrix}$ 4 5 $\begin{array}{c|c} & 2 & \overline{} & 5 \\ + & 9 & -1 & 4 \\ \hline + & 9 & -1 & 4 \end{array}$ 8 6 6 9 1 4 3 $-\frac{1}{3} + \frac{9}{1}$ 7 + $\frac{1}{1}$ $\frac{1}{1}\frac{5}{2}$ $\frac{\overline{8}}{\overline{5}}$ 5 6 7 $7^{-\frac{1}{8}} = \frac{1}{9}$ 1 - 6 - 3

 $Col \rightarrow$ Row $3 \mid 4 \mid$ 7 1 **5** 6 \downarrow 7 7 3 2 5 8 6 4 9 $\mathbf{0}$ $\frac{1}{9}$ $\frac{1}{7}$ $\frac{1}{7}$ $\frac{1}{5}$ $\frac{1}{3} + \frac{1}{1} + \frac{1}{6} = \frac{1}{6}$ $\bar{2}^{-1} - 8^{-1} - \bar{4}$ 1 ¬ --1-9-+ $-\vdash \bar{2}$ 2 $\bar{6}$ $\overline{4}$ 8 7 1 8 3 3 + 9 + 6 $\overline{2}$ 4 + 1 ı <u>5</u> $\bar{5}$ -1-6 5 $\bar{7}$ $\overline{2}$ 8 4 $\frac{1}{3} \frac{4}{1} \frac{-1}{1} \frac{9}{1}$ 5 $\bar{9}$ ---2 $\bar{1}8$ $\bar{1}4$ 6 5 - + 1 1 6 6 1 5 3 $\frac{3}{9}$ _ _ 7 73 **4** | 6 $\frac{5}{5} - \frac{1}{4} - \frac{1}{9} = \frac{5}{9}$ $\frac{1}{7}$ 8

 $\operatorname{Col} \to$ Row 3 | 4 | 5 0 1 $\mathbf{2}$ 6 7 \downarrow $\overline{5}$ 0 -1-8-1-4 $\bar{2}$ 1 7.1 $\frac{3}{8} - \frac{1}{2}$ $\frac{3}{4} + \frac{1}{5} - \frac{3}{7}$ $\bar{3}^{-1} - 9^{-} + \bar{6}$ 2 3 4 + 1 + 53 | 9 | 6 2 | 7 | 8 5 7 -1-6 1 7 8 $\bar{3}$ 7 4 - 1 - 9 4 $\frac{1}{2}$ $\bar{1}8$ $\bar{1}$ $\bar{4}$ $\sqrt{7}$ $\frac{1}{1}\frac{1}{3}$ 5 $\bar{9}$ 5 6 6 5 1 3 $\frac{1}{2}$ 6 7 $^{-4}^{-}$ $\frac{1}{7} - \frac{1}{8} = \frac{1}{9}$ 8

 $Col \rightarrow$ Row $1 \mid 2$ 0 3 | 4 | 5 6 7 | 8 \downarrow 13 5 7 6 9 2 $-\frac{9}{3} \mid \frac{8}{1} \mid \frac{2}{6}$ $\frac{3}{9} - \frac{1}{7} = \frac{7}{5}$ $\frac{1}{2} - \frac{1}{8} - \frac{1}{4}$ $^{\dashv}$ $\bar{1}$ $\bar{3}$ -1-9-+ $-\vdash \bar{2}$ ⁺ 5 $\bar{6}$ $\overline{\mathbf{2}}$ -8 $\overline{4}$ 3 1 5 $\frac{3}{3} + 9 + 6$ 12 18 4 + 1 $\begin{bmatrix} 5 & 7 & 4 & -1 & 9 \end{bmatrix}$ 7.8 4 2 _ L $\overline{6}$ $\frac{1}{1}\frac{1}{3}$ 5 $\overline{4}$ 1 11 ½ 1 1 6 6 1 4 3 $-\frac{1}{3} + \frac{2}{1}$ $\frac{\overline{8}}{\overline{5}}$ $\frac{1}{9}$ $-\,^{\vdash}_{\vdash}\,\bar{6}$ 7 5 $7^{-\frac{1}{1}}\frac{8}{8}$ $\overline{}$

 $Col \rightarrow$ Row $3 \mid 4 \mid$ 7 1 5 6 \downarrow 7 3 2 5 8 6 4 9 0 $\frac{1}{9}$ $\frac{1}{7}$ $\frac{1}{7}$ $\frac{1}{5}$ $\frac{1}{3} + \frac{1}{1} + \frac{1}{6} = \frac{1}{6}$ $\bar{2}^{-1} - 8^{-1} \bar{4}$ 1 ¬ --1-9-+ $\frac{1}{8}$ $\frac{1}{2}$ 2 $\bar{6}$ $\overline{4}$ 3 | 9 | 6 3 12 18 4 | 1 ı <u>5</u> 7 7 4 -1-9 7.8 -1-6 $\bar{3}$ $\bar{7}$ $\overline{2}$ 5 4 $\frac{1}{3} \frac{4}{1} \frac{-1}{1} \frac{9}{1}$ 5 $\bar{9}$ ---2 $\bar{1}8$ $\bar{1}4$ $\overline{6}$ 5 - + 1 1 6 6 1 5 3 8 $\frac{1}{9}$ _ _ $\frac{6}{8}$ $\frac{-1}{3}$ 7 **4** | 6 $\frac{5}{5} - \frac{1}{4} - \frac{1}{9} = \frac{5}{9}$ $\frac{1}{7}$ 8

 $\operatorname{Col} \to$ Row 3 | 4 | 5 0 $1 \mid 2$ 6 7 \downarrow $\frac{1}{2} - \frac{5}{8} - \frac{7}{4}$ $\frac{9}{3} + \frac{8}{1} - \frac{2}{6}$ 0 1 7.1 $\frac{3}{8} - \frac{1}{2}$ $\frac{3}{4} + \frac{1}{5} - \frac{3}{7}$ $\frac{2}{3}$ -1-9- + $\frac{1}{6}$ 2 3 5 + 1 + 34 | 9 | 6 2 | 7 | 8 $\frac{7}{2}$ 5 7 4 9 7 -1-6 1 7 8 4 3 $\frac{1}{5}$ 2 $\sqrt{7}$ $\frac{1}{1} \frac{1}{3}$ 5 $\bar{9}$ 6 6 1 4 3 $\frac{3}{1}$ 5 L 6 7 $\frac{1}{7} - \frac{1}{8} = \frac{1}{9}$ 8

Row

 \downarrow

 $Col \rightarrow$ $1 \mid 2$ 0 3 | 4 | 5 6 7 | 8 3 5 7 2 6 9 $-\frac{9}{3} \mid \frac{8}{1} \mid \frac{2}{6}$ $\frac{6}{9} - \frac{1}{7} = \frac{7}{5}$ $\frac{1}{2} - \frac{1}{8} - \frac{1}{4}$ $^{\dashv}$ $\bar{1}$ - <u>-</u> - <u>-</u> $\bar{3}$ $^{-1}_{1}^{-9}^{-}_{1}^{+}\bar{6}$ $\overline{\mathbf{2}}$ 8 $\overline{4}$ 3 + 3 2 + 9 + 6 4 + 1 15 18 $\begin{bmatrix} 2 & 7 & 4 & -1 & 9 \\ -6 & 1 & 3 & 1 & 1 \end{bmatrix}$ $\begin{bmatrix} 1 \\ 1 \end{bmatrix} \begin{bmatrix} 8 \\ 8 \end{bmatrix}$ 4 3 _ L $\bar{1}4$ 5 5 1 $\frac{1}{1}\frac{2}{1}$ 6 6 1 5 3 8 9 $+\frac{9}{2}$ $\frac{1}{1} = \frac{9}{9}$ 5 $\bar{6}$ 7 $\overline{4}^{-}$ $7^{-\frac{1}{8}} = \frac{7}{2}$ $\frac{1}{1}$ $\frac{1}{6}$

 $Col \rightarrow$ Row $3 \mid 4 \mid$ 7 1 **5** 6 \downarrow 7 $\lceil 3 \rceil$ 2 5 8 6 4 9 $\mathbf{0}$ $\frac{1}{9}$ $\frac{1}{7}$ $\frac{1}{7}$ $\frac{1}{5}$ $\frac{1}{3} + \frac{1}{1} + \frac{1}{6} = \frac{1}{6}$ $\bar{2}^{-1} - 8^{-1} - \bar{4}$ 1 ¬ --1-9-+ $-8^{-} - \frac{7}{2}$ 2 $\bar{6}$ $\overline{4}$ 3 +9+6 4 + 1 3 2 7 + 5 ı 8 - 1 $\overline{}$ $\overline{4}$ -1-6 $\frac{7}{5}$ $\bar{7}$ 8 $\bar{2}$ 4 -3 $\frac{1}{3} \frac{4}{1} \frac{-1}{1} \frac{9}{1}$ 6 5 $\bar{9}$ ---2 $\bar{1}8$ $\bar{1}4$ 5 6 6 9 1 5 3 8 $\frac{8}{5} + \frac{2}{9} + \frac{4}{7}$ $\frac{1}{1}\frac{3}{2}$ _ _ _ + -₁-3- $\bar{1}$ 7 **4** | 6 1 $\frac{1}{5} = \frac{1}{4} = \frac{1}{4}$ 7--8-19 $\bar{2}$ 1 - 6 - 3 8

 $\operatorname{Col} \to$ Row 3 | 4 | 5 0 $1 \mid 2$ 6 7 \downarrow $\frac{9}{3} + \frac{8}{1} - \frac{2}{6}$ $\overline{5}$ 0 -1-8-1-4 $\bar{2}$ 1 7.1 $\frac{3}{8} - \frac{1}{2}$ $\frac{1}{4} + \frac{1}{7} - \frac{1}{5}$ $\bar{3}^{-1} - 9^{-} + \bar{6}$ 2 3 4 + 1 + 52 + 9 + 6 7 | 3 | 8 7 -1-6 1 7 8 $\bar{3}$ 5 $\bar{2}$ 7 4 - 1 - 9 4 18 6 $\frac{1}{2}$ $\bar{1}$ $\bar{4}$ $\sqrt{7}$ 5 $\bar{9}$ 3 $\overline{1}$ $\overline{5}$ 6 5 8 9 1 3 $\frac{1}{9}$ $\frac{1}{1} \frac{3}{2} - \frac{4}{17}$ **4** ⁻ ⁻ 6 5 7 $\frac{1}{7} - \frac{1}{8} = \frac{1}{2}$ 1 6 3 8

 $Col \rightarrow$ Row $1 \mid 2$ 0 3 | 4 | 5 6 7 | 8 \downarrow 13 5 7 6 4 9 2 $-\frac{9}{3} \mid \frac{8}{1} \mid \frac{2}{6}$ $\frac{3}{9} - \frac{1}{7} = \frac{7}{5}$ $\frac{1}{2} - \frac{1}{8} - \frac{1}{4}$ $^{\dashv}$ $\bar{1}$ - <u>-</u> - <u>-</u> $\bar{3}$ -1-9-+ $\bar{6}$ $\overline{\mathbf{2}}$ -8 $\overline{4}$ 3 1 5 2 + 9 + 6 4 + 1 + **3** + 8 $\begin{bmatrix} 2 & 7 & 4 & -1 & 9 \\ -6 & 1 & 5 & 1 & 1 \end{bmatrix}$ 7.8 5 4 _ L $\bar{1}4$ 5 -3 1 $^{\perp}$ 2 6 6 9 1 5 3 8 $-\frac{1}{3} + \frac{9}{1}$ -5 + $\frac{1}{1} \frac{2}{9} \frac{1}{1} \frac{4}{7}$ $\frac{1}{1}$ $\frac{\overline{8}}{\overline{5}}$ $\frac{1}{1}$ $\bar{6}$ 7 $\overline{4}^{-}$ $7^{-\frac{1}{8}} = \frac{1}{9}$ 1 - 6 - 3

 $Col \rightarrow$ Row $3 \mid 4 \mid$ 7 1 5 6 \downarrow 7 3 2 5 8 6 4 9 $\mathbf{0}$ $\frac{1}{9}$ $\frac{1}{7}$ $\frac{1}{7}$ $\frac{1}{5}$ $\frac{1}{3} + \frac{1}{1} + \frac{1}{6} = \frac{1}{6}$ $\bar{2}^{-1} - 8^{-1} - \bar{4}$ 1 ¬ --1-9-+ $-\vdash \bar{2}$ 2 $\bar{6}$ $\overline{4}$ 8 3 3 + 9 + 6 4 + 1 ı <u>5</u> 7 1 **2** ı 8 $\overline{}$ $\overline{4}$ -1-6 $\bar{3}$ $\bar{7}$ $\overline{2}$ 8 5 4 $\frac{1}{3} \frac{4}{1} \frac{-1}{1} \frac{9}{1}$ 5 $\bar{9}$ ---2 $\bar{1}8$ $\bar{1}4$ 6 5 - + 1 1 6 6 1 5 3 8 9 $\begin{bmatrix}
 8 & | & 9 & | & 4 \\
 2 & | & 5 & | & 7 \\
 1 & | & 6 & | & 3
 \end{bmatrix}$ $\frac{3}{9}$ _ _ **4** | 6 7 7-3 $\frac{5}{5} - \frac{1}{4} - \frac{1}{9} = \frac{5}{9}$ 7--8 $\overline{}$ $\overline{}$ 8

 $\operatorname{Col} \to$ Row 3 | 4 | 5 0 1 $\mathbf{2}$ 6 7 \downarrow $-\frac{7}{4}$ $\frac{3}{9} + \frac{8}{1} - \frac{2}{6}$ 5 9 0 6 $\frac{3}{3} - \frac{1}{7} = \frac{1}{5}$ -1-8-1-4 $\bar{2}$ 1 7.1 $\frac{3}{8} - \frac{1}{2}$ $\frac{1}{4} + \frac{1}{7} - \frac{5}{1}$ $\bar{3}^{-1} - 9^{-} + \bar{6}$ 2 3 4 + 1 + 52 | 9 | 6 7 | 3 | 8 7 -1-6 $\lceil \bar{3} \rceil$ 1 7 8 5 $\bar{2}$ 7 4 - 1 - 9 4 18 6 $\frac{1}{2}$ $\bar{1}\bar{3}$ $\sqrt{7}$ 5 $\bar{9}$ 4 $\overline{1}$ $\overline{5}$ 3 6 5 8 9 1 $\frac{1}{1} \frac{3}{2} - \frac{4}{17}$ $\frac{-9}{9}$ $\frac{1}{6}$ 5 7 $\frac{1}{1}$ $\frac{1}{7} - \frac{1}{8} = \frac{1}{2}$ 1 6 3 8

Row

 \downarrow

 $Col \rightarrow$ 0 1 $\mathbf{2}$ 3 | 4 | 5 6 7 | 8 1 3 8 2 7 6 4 5 $\frac{3}{9} - \frac{1}{7} = \frac{7}{5}$ $\frac{3}{8} + \frac{1}{1} + \frac{2}{6}$ $\bar{2}^{-1}4^{-1}\bar{3}$ $^{\dashv}$ $\bar{1}$ 5 -1 -9 + - - - - - - - - ⁺ 3 $\bar{6}$ 2 $\overline{4}$ 8 3 3 +9+6 ı <u>5</u> + 1 ı 4 2 - [1 7 - 6 $-\frac{7}{1}\frac{2}{8}$ 7.8 3 7 4 7 9 5 4 _ _ _ L $\frac{1}{1}\frac{4}{2}$ $\bar{9}$ $\bar{1}4$ $\overline{6}$ 5 3 ı 5 1 11 2 6 6 9 1 5 3 3 $\frac{1}{7} - \frac{4}{5}$ $\frac{1}{1}$ $\bar{8}$ $\bar{1}$ $\bar{6}$ 9 7 $\overline{4}^{-}$ $-\frac{1}{2} - \frac{1}{1} = \frac{1}{5}$ $\frac{1}{1} + \frac{1}{6} + \frac{1}{3}$ $7^{-\frac{1}{8}} = \frac{1}{9}$ $\bar{4}$

$Col \rightarrow$ Row $3 \mid 4 \mid$ 1 5 6 \downarrow 3 | 8 6 4 5 $\mathbf{0}$ $\frac{1}{9}$ $\frac{1}{7}$ $\frac{1}{7}$ $\frac{1}{5}$ $\frac{1}{2} - \frac{1}{4} - \frac{1}{4} = \frac{1}{3}$ $\frac{1}{8} + \frac{1}{1} + \frac{1}{6} = \frac{1}{6}$ 1 ¬ --1-9-+ ⁺ ⁻ 3 $-8^{-} - \frac{7}{2}$ 2 $\bar{6}$ $\overline{4}$ 5 | 9 | 6 7 8 7 4 9 3 $\overline{2}$ 3 + 1 ı 4 $\begin{bmatrix} \frac{7}{5} \\ \frac{1}{8} \end{bmatrix}$ -1-6 $\bar{7}$ $\bar{3}$ 4 8 5 $\bar{9}$ ---2 $\overline{6}$

- + 1 1

 $\bar{1}$ $\bar{9}$

-|-3

⁻¹5

 $\overline{4}$ 8

1 5

_ _ **4** | 6

7--8

3 $\frac{3}{9}$

 $-\frac{1}{2}$

6 6

7

7

 $\frac{1}{1} \cdot \frac{5}{5} \cdot 1 \cdot 1$

9

2

 $\operatorname{Col} \to$ Row 3 | 4 | 5 0 $1 \mid 2$ 6 7 \downarrow $\frac{5}{8} + \frac{9}{1} - \frac{2}{6}$ i 8 0 $-\frac{1}{4} - \frac{1}{1} = \frac{1}{3}$ $\bar{2}$ 1 7.1 $\frac{3}{8} - \frac{1}{2}$ $\frac{2}{5}$ -1-9- + $\frac{6}{6}$ $\frac{3}{4} + \frac{1}{3} - \frac{3}{7}$ 2 3 3 + 1 + 45 | 9 | 6 7 | 2 | 8 $\begin{bmatrix} \frac{1}{5} \\ \frac{1}{8} \end{bmatrix}$ 7 -1-6 $[1, \frac{1}{8}]$ 3 7 4 7 9 4 -12^{-} $\bar{1}$ $\bar{4}$ $\sqrt{7}$ $\frac{1}{1}$ $\frac{1}{5}$ 5 $\bar{9}$ 3 6 $\frac{9}{2} + \frac{8}{7} + \frac{4}{5}$ 6 5 1 3 $\frac{1}{9}$ **4** ⁻ ⁻ 6 7 $\frac{1}{7} - \frac{1}{8} = \frac{1}{2}$ 1 6 3 8

 $Col \rightarrow$ Row 0 1 $\mathbf{2}$ 3 | 4 | 5 6 7 | 8 \downarrow 13 8 7 2 6 4 5 $\frac{3}{9} - \frac{1}{7} = \frac{7}{5}$ $\frac{3}{8} + \frac{1}{1} + \frac{2}{6}$ $\bar{2}^{-1}4^{-1}\bar{3}$ - <u>-</u> - 2 5 -1 -9 + $\stackrel{\dashv}{\cdot}$ $\stackrel{-}{1}$ ⁺ 3 2 $\bar{6}$ $\overline{4}$ -8 3 3 5 + 9 + 6 12 18 + 1 ı 4 7.8 3 7 4 9 4 $\overline{2}$ _ L 3 $\bar{1}4$ 6 $\frac{1}{1}\frac{1}{5}$ 5 1 11 6 2 6 9 1 5 3 $\frac{1}{7} - \frac{4}{5}$ $\frac{1}{1}$ $\bar{1}$ $\bar{6}$ 9 $\bar{8}$ -|-3 7 $\overline{4}^{-}$ $-\frac{1}{5}$ $\frac{1}{1} + \frac{1}{6} + \frac{1}{3}$ $7^{-\frac{1}{8}} = \frac{1}{9}$ $\bar{4}$

$Col \rightarrow$ Row 3 1 4 5 6 7 \downarrow 7 2 8 3 6 4 5 0 9 $\frac{1}{9}$ $\frac{1}{7}$ $\frac{1}{7}$ $\frac{1}{5}$ $\frac{1}{2} - \frac{1}{4} - \frac{1}{4}$ $\frac{1}{8} + \frac{1}{1} + \frac{1}{6} = \frac{1}{6}$ $\bar{3}$ 1 7.7 -1-5-+ $-\vdash \bar{2}$ ⁺ ⁻ 3 $\bar{6}$ 2 $\bar{9}$ $\overline{4}$ 8 | 2 | 5 | 5 3 + 9 3 | 1 4 + 6 7 1 **5** 1 8 - 1 ⁻1 7 4 7 9 $\bar{7}$ 4 6 $\overline{2}$ 8 3 . L <u>t</u> . I <u>5</u> $\frac{1}{1} = \frac{1}{2} = \frac{1}{1}$ 5 $\bar{4}$ $\bar{1}8$ $\overline{6}$ -i-9 3 $\frac{2}{9} + \frac{8}{7} + \frac{5}{4}$ 6 9 7 6 1 4 3 $\frac{1}{1}\frac{3}{2}$ $\frac{3}{8}$ -1-3 _ + - ⊢ 7 $\bar{1}$ 5 6 $\frac{1}{5} - \frac{1}{1} - \frac{1}{2} - \frac{1}{1}$ $\bar{4}$ $7^{-\frac{1}{8}} = \frac{1}{8} = \frac{1}{9}$ 1 - 6 - 3 8

 $\mathbf{Col} \to$ Row 3 | 4 | 5 0 1 $\mathbf{2}$ 6 7 \downarrow ___3 $\begin{array}{c|c}
\hline
6 & 3 & 4 \\
9 & 7 & 5
\end{array}$ 8 0 -14 - 13 $\bar{2}$ 1 7.1 - + 5 $\frac{3}{8} - \frac{1}{2}$ 6 -1-5 $\frac{3}{4} + \frac{1}{3} - \frac{3}{7}$ 2 3 3 + 1 + 42 | 9 | 6 7 | 5 | 8 -1-6 1 7 8 $\bar{7}$ 5 3 7 4 7 9 4 $\bar{1}4$ $\overline{5}$ $\sqrt{7}$ $\frac{1}{1} \frac{1}{2} \frac{1}{1} \frac{1}{1}$ 5 3 6 2 9 \frac{1}{4} \frac{8}{7} - \frac{1}{1} \frac{4}{5} 6 6 5 1 3 $\frac{1}{2}$ 6 $\bar{1}$ 7 $\overline{4}^{-}$ 1 - 6 - 3 4 - 2 5 $\frac{1}{7} - \frac{1}{8} = \frac{1}{9}$ 8

 $Col \rightarrow$ Row 0 1 $\mathbf{2}$ 3 | 4 | 5 6 7 \downarrow 3 8 7 6 5 2 $\frac{3}{9} - \frac{1}{7} = \frac{7}{5}$ $\frac{3}{8} + \frac{1}{1} + \frac{2}{6}$ $\bar{2}^{-1}4^{-1}\bar{3}$ $^{\dashv}$ $\bar{1}$ - + 9 -1-5 $-\vdash \bar{2}$ ⁺ 3 $\overline{6}$ $\overline{\mathbf{2}}$ $\overline{4}$ 8 3 2 $\frac{3}{3} + 9 + 6$ 1.5 4 + 1 $\begin{bmatrix} 3 & 7 & 4 & -1 & 9 \\ 3 & 1 & 4 & 1 & 9 \end{bmatrix}$ 7 - 6 7.8 4 2 $\frac{1}{2} \frac{4}{1} \frac{1}{1}$ _ _ _ L $\bar{3}$ $\bar{1}8$ $\frac{1}{1} \frac{7}{7}$ $\overline{6}$ 5 ı 9 $\overline{4}$ $\begin{array}{c|c} & & \hline & 8 & \hline & 5 \\ + & 7 & - 4 \\ \hline & 7 & - 4 \end{array}$ 6 2 9 6 1 4 3 $\frac{9}{8} = \frac{1}{5}$ $-\frac{1}{2}$ $-\frac{1}{4}$ $\frac{1}{4}$ $\frac{1}{1}$ -69 7 5 $\frac{1}{1} + \frac{1}{6} + \frac{1}{3}$ $7^{-\frac{1}{8}} = \frac{1}{9}$

 $Col \rightarrow$ Row $3 \mid 4 \mid$ 7 1 5 6 \downarrow 7 2 8 3 6 4 5 0 9 $\frac{1}{9}$ $\frac{1}{7}$ $\frac{1}{7}$ $\frac{1}{5}$ $\frac{1}{2} - \frac{1}{4} - \frac{1}{4}$ $\frac{1}{8} + \frac{1}{1} + \frac{1}{6} = \frac{1}{6}$ $\bar{3}$ 1 7.7 -1-5-+ $-\vdash \bar{2}$ ⁺ ⁻ 3 $\bar{6}$ 2 $\bar{9}$ $\overline{4}$ 8 | 2 | 5 | 5 3 3 + 9 + 6 4 + 1 7 1 **5** 1 8 - 1 · - 1 7 4 7 9 $\bar{7}$ 4 6 $\overline{2}$ 8 3 $\frac{1}{1} = \frac{1}{2} = \frac{1}{1}$ 5 $\bar{3}$ $\bar{1}8$ $\bar{1}4$ $\overline{6}$ -i-9 5 $\frac{2}{9} \stackrel{|}{+} \frac{8}{7} \stackrel{|}{-} \frac{4}{5}$ 6 9 6 1 5 3 $\frac{1}{1}\frac{3}{2}$ _ _ _ + 7 -|-3 $\bar{1}$ **4** | 6

 $\bar{4}$

 $7^{-\frac{1}{8}} = \frac{1}{9}$

1 6 3

 $\frac{1}{5} - \frac{1}{1} - \frac{1}{2} - \frac{1}{1}$

8

 $\operatorname{Col} \to$ Row 3 | 4 | 5 0 1 $\mathbf{2}$ 6 7 \downarrow $\begin{array}{c|c}
6 & 3 & 4 \\
\hline
9 & 7 & 5
\end{array}$ 8 0 -14 - 13 $\bar{2}$ 1 7.1 $\frac{3}{8} - \frac{1}{2}$ 6 -1-5 - + 9 $\frac{3}{4} + \frac{1}{3} - \frac{3}{7}$ 2 3 4 + 1 + 53 | 9 | 6 7 | 2 | 8 7 -1-6 1 7 8 3 7 4 7 9 4 5 $\bar{1}4$ $\overline{3}$ 2 $\frac{1}{1} \frac{1}{5}$ 5 6 2 9 6 5 1 3 $\frac{1}{2}$ 6 7 $^{-4}^{-}$ 1 - 6 - 3 $\frac{1}{7} - \frac{1}{8} = \frac{1}{9}$ 8

 $Col \rightarrow$ Row 0 1 $\mathbf{2}$ 3 | 4 | 5 6 7 \downarrow 3 8 7 6 5 2 $\frac{3}{9} - \frac{1}{7} = \frac{7}{5}$ $\frac{3}{8} + \frac{1}{1} + \frac{2}{6}$ $\bar{2}^{-1}4^{-1}\bar{3}$ $^{\dashv}$ $\bar{1}$ - + 9 -1-5 $-\vdash \bar{2}$ ⁺ 3 $\bar{6}$ $\overline{\mathbf{2}}$ $\overline{4}$ 8 3 +9+6 12 18 5 + 1 ı 4 3 - - - 1 $\frac{7}{1}$ 7.8 3 7 4 9 7 - 6 4 5 _ _ _ _ L $\bar{3}$ 2 $\bar{1}4$ 6 $\frac{1}{1}\frac{1}{5}$ 5 ı 9 1 11 6 9 6 5 3 2 1 $\frac{1}{7} - \frac{4}{5}$ $\frac{1}{1}$ $\bar{8}$ -,-3 $\bar{1}$ $\bar{6}$ 9 7 $\overline{4}^{-}$ $-\frac{1}{2} - \frac{1}{1} \frac{1}{5}$ $\frac{1}{1} + \frac{1}{6} + \frac{1}{3}$ $7^{-\frac{1}{8}} = \frac{1}{9}$ $\bar{4}$

$Col \rightarrow$ Row $3 \mid 4 \mid$ 7 1 5 6 \downarrow 7 2 8 3 6 4 5 $\mathbf{0}$ 9 $\frac{1}{9}$ $\frac{1}{7}$ $\frac{1}{7}$ $\frac{1}{5}$ $\frac{1}{2} - \frac{1}{4} - \frac{1}{4} = \frac{1}{3}$ $\frac{1}{8} + \frac{1}{1} + \frac{1}{6} = \frac{1}{6}$ 1 7.7 -1-5-+ $-\vdash \bar{2}$ ⁺ ⁻ 3 $\bar{9}$ 2 $\bar{6}$ $\overline{4}$ 8 | 2 | 5 | 5 3 +9+6 3 + 1 4 7 1 **5** 1 8 - 1 ⁻1 7 4 7 9 $\bar{7}$ 6 $\overline{2}$ 8 3 4 $\frac{1}{2} \frac{4}{1} \frac{9}{1}$. L <u>t</u> . I <u>5</u> 5 $\bar{4}$ $\bar{1}8$ $\overline{6}$ -i-9 3 $\frac{2}{9} + \frac{8}{7} + \frac{5}{4}$ 6 6 7 9 1 4 3 $\frac{1}{1}\frac{3}{2}$ _ + - ⊢ 7 -|-3 $\bar{1}$ 5 6 $\frac{1}{5} - \frac{1}{1} - \frac{1}{2} - \frac{1}{1}$ $7^{-1} = \frac{1}{8} = \frac{1}{9}$ $\bar{4}$ 1 - 6 - 3 8

 $\operatorname{Col} \to$ Row 3 | 4 | 5 0 1 $\mathbf{2}$ 6 7 \downarrow i 8 0 -14 - 13 $\bar{2}$ 1 7.1 $\frac{5}{9} - \frac{1}{5} - \frac{5}{6}$ $\frac{3}{8} - \frac{1}{2}$ $\frac{3}{4} + \frac{1}{3} - \frac{3}{7}$ 2 3 3 + 1 + 42 | 9 | 6 7 | 5 | 8 -1-6 1 7 8 $\bar{7}$ 3 7 4 7 9 5 4 $\bar{1}4$ $\frac{1}{1}$ $\frac{1}{2}$ $\overline{5}$ $\sqrt{7}$ 5 3 6 2 9 \frac{1}{4} \frac{8}{7} - \frac{1}{1} \frac{4}{5} 6 9 5 1 3 $\frac{1}{2}$ 6 $\bar{1}$ 7 $\overline{4}^{-}$ $\frac{3}{4} - \frac{3}{2} - \frac{1}{5}$ 1 - 6 - 3 $\frac{1}{7} - \frac{1}{8} = \frac{1}{9}$ 8

Row

 \downarrow

 $Col \rightarrow$ 0 1 $\mathbf{2}$ 3 | 4 | 5 6 7 | 8 3 8 7 2 6 4 5 $\frac{3}{9} - \frac{1}{7} = \frac{7}{5}$ $\frac{3}{8} + \frac{1}{1} + \frac{2}{6}$ $\bar{2}^{-1}4^{-1}\bar{3}$ -1-5 $\stackrel{\dashv}{\cdot}$ $\stackrel{-}{1}$ $\bar{9}$ $-\vdash \bar{2}$ ⁺ 3 $\overline{\mathbf{2}}$ $\bar{6}$ $\overline{4}$ 8 3 2 $\frac{3}{3} + 9 + 6$ 1 5 4 + 1 $\begin{bmatrix} 3 & 7 & 4 & -1 & 9 \\ 3 & 1 & 4 & 1 & 9 \end{bmatrix}$ 7 - 6 7 5 7.8 4 2 $\frac{1}{1}\frac{4}{2}$ _ _ _ L $\bar{3}$ $\bar{1}8$ $\frac{1}{1} \frac{1}{7}$ $\overline{6}$ 5 ı 9 $\overline{4}$ 1 1 $\begin{array}{c|c} & & \hline & 8 & \hline & 5 \\ + & 7 & - 4 \\ \hline & 7 & - 4 \end{array}$ 6 2 6 9 1 4 3 $\frac{\overline{8}}{\overline{5}}$ $-\frac{1}{3} - \frac{1}{4}$ $\frac{1}{1}$ $-\,^{\vdash}_{\vdash}\,\bar{6}$ 9 7 5 $\frac{1}{1} + \frac{1}{6} + \frac{1}{3}$ $7^{-\frac{1}{8}} = \frac{1}{9}$

$Col \rightarrow$ Row 3 7 1 4 5 6 \downarrow 7 2 8 3 6 4 5 0 9 $\frac{1}{9}$ $\frac{1}{7}$ $\frac{1}{7}$ $\frac{1}{5}$ $\frac{1}{2} - \frac{1}{4} - \frac{1}{4} = \frac{1}{3}$ $\frac{1}{8} + \frac{1}{1} + \frac{1}{6} = \frac{1}{6}$ 1 7.7 -1-5-+ $-\vdash \bar{2}$ ⁺ ⁻ 3 $\bar{9}$ 2 $\bar{6}$ $\overline{4}$ 8 $\frac{1}{1}$ $\frac{2}{5}$ 3 3 + 9 + 6 4 + 1 7 1 **5** 1 8 · - 1 7 4 7 9 $\bar{7}$ 6 $\overline{2}$ 8 3 4 $\frac{1}{1} = \frac{1}{2} = \frac{1}{1}$ 5 $\bar{3}$ $\bar{1}8$ $\bar{1}4$ $\overline{6}$ -i-9 5 $\frac{2}{9} \stackrel{|}{+} \frac{8}{7} \stackrel{|}{-} \frac{4}{5}$ 6 6 9 1 5 3 $\frac{1}{1}\frac{3}{2}$ _ _ _ + 7 -|-3 $\bar{1}$ **4** | 6 $\frac{1}{5} - \frac{1}{1} - \frac{1}{2} - \frac{1}{1}$ $\bar{4}$ $7^{-\frac{1}{8}} = \frac{1}{9}$ 1 - 6 - 3 8

 $\operatorname{Col} \to$ Row 3 | 4 | 5 0 1 $\mathbf{2}$ 6 7 \downarrow $\begin{array}{c|c}
6 & 3 & 4 \\
\hline
9 & 7 & 5
\end{array}$ i 8 0 -14 - 13 $\bar{2}$ 1 7.1 - + 6 $\frac{3}{8} - \frac{1}{2}$ 9 -1-5 $\frac{3}{4} + \frac{1}{3} - \frac{3}{7}$ 2 3 4 + 1 + 53 | 9 | 6 7 | 2 | 8 7 -1-6 $\begin{bmatrix} 1 \\ \end{bmatrix} \begin{bmatrix} \overline{8} \end{bmatrix}$ 3 7 4 7 9 4 5 $\bar{1}4$ $\overline{3}$ 2 $\sqrt{7}$ $\frac{1}{1} \frac{1}{5}$ 5 6 2 9 \frac{1}{4} \frac{8}{7} - \frac{1}{1} \frac{4}{5} 6 9 5 1 3 $\frac{1}{2}$ 6 $\bar{1}$ 7 $^{-4}^{-}$ 1 - 6 - 3 $\frac{1}{5} - \frac{1}{2} - \frac{1}{4}$ $\frac{1}{7} - \frac{1}{8} = \frac{1}{9}$ 8

 $Col \rightarrow$ Row 0 1 $\mathbf{2}$ 3 | 4 | 5 6 7 \downarrow 3 8 7 2 6 5 $\frac{3}{9} - \frac{1}{7} = \frac{7}{5}$ $\frac{3}{8} + \frac{1}{1} + \frac{2}{6}$ $\bar{2}^{-1}4^{-1}\bar{3}$ $^{\dashv}$ $\bar{1}$ $\bar{9}$ -1-5 $-\vdash \bar{2}$ ⁺ 3 $\overline{\mathbf{2}}$ $\bar{6}$ $\overline{4}$ 8 3 5 +9+6 12 18 + 1 ı 4 3 - - - 1 7 - 6 $-\frac{7}{1}\frac{2}{8}$ 7.8 3 7 4 9 4 5 _ L $\bar{3}$ 2 $\bar{1}4$ 6 $\frac{1}{1} = \frac{1}{5}$ 5 ı 9 1 11 6 2 6 9 1 5 3 $\frac{1}{7} - \frac{4}{5}$ $-\frac{1}{2}$ $-\frac{1}{5}$ $\frac{1}{1}$ $\bar{8}$ $\bar{6}$ 9 7 $\overline{4}^{-}$ $\frac{1}{1} + \frac{1}{6} + \frac{1}{3}$ $7^{-\frac{1}{8}} = \frac{1}{9}$ $\bar{4}$

| Col | \rightarrow | | | | | | | | |
|-----|--|--|--|--|--|--|--|--|--|
| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 0 | 1 | 8 | 7 | 6 | 3 | 4 | 9 | 5 | 2 |
| 1 | $\bar{2}^{-}$ | 4 | $\bar{3}$ | 9 | $\lceil 7 \rceil$ | 5 | 8 | 1 | $\begin{bmatrix} -6 \end{bmatrix}$ |
| 2 | 6 | 5 | [9] | 8 | $\lceil ar{2} \rceil$ | 11 | $\lceil 4 \rceil$ | 3 | $\overline{7}$ |
| 3 | 3 | · 1 | · 2 | 4 | - 9 | - 6 | 5 | 7 | 8 |
| 4 | 7 - | 6 | $\lceil \bar{5} \rceil$ | $\frac{1}{2}$ | 「ī ⁻ | 8 | $\overline{3}$ | [4] | 9 |
| 5 | $\bar{4}^-$ | 9 | 8 | 3 | $\bar{5}$ | 7 | $\overline{6}$ | $\frac{1}{2}$ | 1 |
| 6 | 9 | 7 | 6 | 1 | <u> </u> 4 | 3 | 2 | 8 | 5 |
| 7 | 8 - | 3 | - ī ⁻ | 5 | $\bar{6}$ | $\frac{1}{1}$ $\frac{1}{2}$ | $^{-7}$ | 9 - | $\overline{4}$ |
| 8 | $\overline{5}^{-}$ | 2 | $\bar{4}^-$ | 7 | $\lceil 8 \rceil$ | 9 | 1 | 6 | 3 |
| | $egin{array}{c} 0 \ 1 \ 2 \ 3 \ 4 \ 5 \ 6 \ 7 \ \end{array}$ | $\begin{array}{c cccc} 0 & \frac{1}{2} \\ \hline 1 & \frac{2}{6} \\ \hline 2 & \frac{6}{6} \\ \hline 3 & \frac{3}{7} \\ \hline 5 & \frac{4}{4} \\ \hline 6 & \frac{9}{8} \\ \hline 7 & \frac{8}{8} \\ \end{array}$ | $\begin{array}{c c c c c c c c c c c c c c c c c c c $ | $\begin{array}{c c c c c c c c c c c c c c c c c c c $ | $\begin{array}{c c c c c c c c c c c c c c c c c c c $ | $\begin{array}{c c c c c c c c c c c c c c c c c c c $ | $\begin{array}{c c c c c c c c c c c c c c c c c c c $ | $\begin{array}{c c c c c c c c c c c c c c c c c c c $ | $\begin{array}{c c c c c c c c c c c c c c c c c c c $ |

| | Col | \rightarrow | | | | | | | | |
|----------------|----------------|----------------------------------|-----|-------------------------|---|------------------------------|---------------|-----------------------------------|---------------|-----------------------------------|
| \mathbf{Row} | | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| \ | 0 | 1 | 8 | 7 | 6 | 3 | 4 | 9 | 5 | 2 |
| | 1 | $\bar{2}$ | 4 | ī <u>ā</u> - | 9 | $\bar{}^{}$ | 5 | 8 | 1 | · 6 |
| | 2 | $\overline{6}$ | 5 | $\frac{+}{9}$ - | 8 | $\lceil \bar{2} \rceil$ | 1 1 | $\overline{4}$ | 3 - | [7] |
| | 3 | 3 | · 1 | ı 4 | 2 | 9 | - 6 | 5 | · 7 | · 8 |
| | $\overline{4}$ | 7 - | 6 | $\lceil \bar{2} \rceil$ | 5 | $\lceil \overline{1} \rceil$ | 8 | $\overline{3}$ | [4] | -9 |
| | 5 | $\bar{5}$ | 9 | $\overline{8}$ | 3 | $\overline{4}$ | 7 | $\begin{bmatrix} 6 \end{bmatrix}$ | $\frac{1}{2}$ | 1^{-1} |
| | 6 | 9 | 7 | 6 | 1 | 5 | 3 | 2 | 8 | 4 |
| | 7 | $\bar{8}^{-}$ | 3 | īī - | 4 | $\bar{6}$ | $\frac{1}{2}$ | $\overline{7}$ | 9 | $\begin{bmatrix} 5 \end{bmatrix}$ |
| | 8 | $\lceil \ \overline{4} \ \rceil$ | 2 | $\bar{5}$ | 7 | $\bar{8}$ | 9 | 1 | 6 | [3] |

$Col \rightarrow$ Row $3 \mid 4 \mid$ 7 1 5 6 \downarrow 7 2 8 3 5 6 4 9 $\mathbf{0}$ $\frac{1}{9}$ $\frac{1}{7}$ $\frac{1}{7}$ $\frac{1}{5}$ 8 1 1 6 $\frac{1}{2} - \frac{1}{4} - \frac{1}{4}$ $\bar{3}$ 1 7.7 -1-5-+ $-\vdash \bar{2}$ ⁺ ⁻ 3 $\bar{6}$ 2 $\bar{9}$ $\overline{4}$ 8 | 2 | 5 | 5 3 3 + 9 + 6 4 + 1 5 + 7 ı 8 - 1 $\overline{4}$ · - 1 $\bar{7}$ 4 6 $\overline{2}$ 8 3 . L <u>t</u> . I <u>5</u> $\frac{1}{1} \cdot \frac{1}{2} \cdot \frac{1}{1} \cdot \frac{1}{1}$ 5 $\bar{3}$ $\bar{1}8$ 6 -i-9 $\overline{4}$ 6 9 7 6 1 4 3 $\frac{1}{1}\frac{3}{2}$ _ + - ⊢ 7 -|-3 $\bar{1}$ 5 6

 $\bar{4}$

7--8

- 9

 $\frac{1}{5} - \frac{1}{1} - \frac{1}{2} - \frac{1}{1}$

8

 \downarrow

 $\operatorname{Col} \to$ Row 3 | 4 | 5 0 1 $\mathbf{2}$ 6 7 \downarrow $\frac{9}{8} + \frac{5}{1} - \frac{2}{6}$ i 8 0 -14 - 13 $\bar{2}$ 1 7.1 $\frac{3}{8} - \frac{1}{2}$ $\frac{3}{4} + \frac{1}{3} - \frac{3}{7}$ 6 -1-5 + 9 2 3 4 | 1 12 3 | 9 | 6 5 | 7 | 8 $\frac{1}{5}$ 7 -1-6 $[1, \frac{1}{8}]$ 3 7 4 7 9 4 $\overline{1}$ $\overline{2}$ $\overline{3}$ $\bar{1}$ $\bar{4}$ $\sqrt{7}$ 5 5 6 6 5 1 3 $\frac{3}{1}$ 6 7 $^{-4}^{-}$ $\frac{1}{7} - \frac{1}{8} = \frac{1}{9}$ 8

 $Col \rightarrow$ Row 0 1 $\mathbf{2}$ 3 | 4 | 5 6 7 | 8 3 8 7 2 6 4 9 $-\frac{9}{8} + \frac{1}{1} + \frac{5}{1} - \frac{2}{6}$ $\frac{3}{9} - \frac{1}{7} = \frac{7}{5}$ $\bar{2}^{-1}4^{-1}\bar{3}$ $^{\dashv}$ $\bar{1}$ - + <u>9</u> -1-5 $-\vdash \bar{2}$ ⁺ ⁻ 3 $\overline{6}$ $\overline{\mathbf{2}}$ $\overline{4}$ 8 3 1 5 +9+6 3 4 + 1 2 $\begin{bmatrix} \frac{1}{5} & \frac{1}{4} & \frac{1}{9} \\ \frac{1}{6} & \frac{1}{2} & \frac{1}{1} \end{bmatrix}$ $\frac{7}{7} \stackrel{-1}{\stackrel{-6}{-}} \stackrel{7}{\stackrel{}{=}} \frac{2}{8}$ 7.8 4 3 4 5 1 $\begin{array}{c|c} & & \hline & 8 & \hline & 5 \\ + & 9 & -1 & 5 \\ - & 9 & -1 & 4 \\ \hline - & c & - & \end{array}$ $\frac{2}{7}$ 6 9 6 1 4 3 $\frac{9}{8} = \frac{1}{5}$ $-\frac{1}{2}$ $-\frac{1}{4}$ $\frac{1}{4}$ $\frac{1}{1}$ $-\,^{\vdash}_{\vdash}\,\bar{6}$ 7 5 $7^{-\frac{1}{8}} = \frac{1}{9}$ 1 - 6 - 3

3 4 1 1 5 2 9 6 3 7 8 4 7 6 7 2 3 7 1 8 5 4 9 5 3 9 8 5 4 7 6 2 1 6 9 7 6 1 2 1 6 9 7 6 1 2 1 7 8 3 1 4 4 7 6 2 1 7 8 3 1 4 4 6 2 7 1 9 5 8 5 2 4 7 8 9 1 6 3

6 7 8

 $\mathbf{Col} \to$

 $\mathop{\bf Row}_{\downarrow}$

| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|--------------------|----------|------------------------------|---|---------------------|-----------------------------|-------------------|------------------|-----|
| 0 | 1 | 8 | 7 | 6 | 3 | 4 | 9 | 5 | 2 |
| 1 | $\bar{2}^{-}$ | 4 | $\bar{3}$ | 0 | . ' | 5 | 8 | 1 | 6 |
| 2 | $\overline{6}$ | 5 | [9] | 8 | $\lceilar{2}\rceil$ | 11 | $\lceil 4 \rceil$ | † 3 – | 7 |
| 3 | 5 | · 1 | ı 4 | 2 | ı 9 | □ 6 | 3 | · 7 | · 8 |
| 4 | 7 - | 6 | $\lceil \bar{2} \rceil$ | 3 | [1 | 18 | 5 | $\frac{1}{4}$ | 9 |
| 5 | $\bar{3}$ | 9 | $\bar{8}$ | 4 | $\overline{5}$ | 7 | $\overline{6}$ | $\frac{1}{2}$ | 1 |
| 6 | 9 | <u> </u> | 6 | 1 | 4 | 1 3 | 2 | 8 | 5 |
| 7 | $\bar{8}^-$ | 3 | i ī - | 5 | [6] | $\frac{1}{1}$ $\frac{1}{2}$ | $^{-7}$ | 9 - | 4 |
| 8 | $\overline{4}^{-}$ | 2 | $\lceil \overline{5} \rceil$ | 7 | 8 | 9 | 1 | 6 | |

 $\mathbf{Col} \to$

 $\mathbf{Row} \downarrow$

| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|----------------|----------------|-----|-------------------------|---|---------------------------|---------------|-----------------------------------|---------------|-----|
| 0 | 1 | 8 | 7 | 6 | 3 | 4 | 9 | 5 | 2 |
| 1 | $\bar{2}^{-}$ | 4 | $\bar{3}$ | 9 | $\lceil 7 \rceil$ | | 8 | 1 | 6 |
| 2 | $\overline{6}$ | 5 | $\lceil \bar{9} \rceil$ | 8 | $\lfloor \bar{2} \rfloor$ | 1 1 | $\overline{4}$ | 3 | -7- |
| 3 | 5 | · 1 | · 4 | 2 | 9 | - 6 | | | · 8 |
| $\overline{4}$ | 7 - | 6 | $\lceilar{2}\rceil$ | 3 | [[| 8 | -5 | [4] | 9 |
| 5 | $\bar{3}$ | 9 | $\bar{8}$ | 5 | $\bar{4}$ | 7 | $\begin{bmatrix} 6 \end{bmatrix}$ | $\frac{1}{2}$ | 1 |
| 6 | 9 | 7 | 6 | 1 | 5 | 3 | 2 | 8 | ¦ 4 |
| 7 | $\bar{8}^-$ | 3 | $\bar{1}$ | 4 | $\bar{6}$ | $\frac{1}{2}$ | $\overline{7}$ | 9 - | 5 |
| 8 | $\bar{4}^-$ | 2 | $\bar{5}$ | 7 | · 8 - | 9 | 1 | 6 | 3 |

 $Col \rightarrow$ Row $3 \mid 4 \mid$ 7 1 **5** 6 \downarrow 7 2 8 3 5 6 4 9 $\mathbf{0}$ $\frac{1}{9}$ $\frac{1}{7}$ $\frac{1}{7}$ $\frac{1}{5}$ $\frac{1}{8} + \frac{1}{1} + \frac{1}{6} = \frac{1}{6}$ $\frac{1}{2} - \frac{1}{4} - \frac{1}{4} = \frac{1}{3}$ 1 ¬ --1-5-+ $-\vdash \bar{2}$ ⁺ ⁻ 3 $\bar{9}$ 2 $\bar{6}$ $\overline{4}$ 8 | 2 | 5 | 5 3 +9+6 3 | 1 4 5 + 7 ı 8 - 1 $\overline{4}$ ⁻1 $\bar{7}$ 6 $\bar{2}$ 8 3 4 . L <u>t</u> . I <u>5</u> $\frac{1}{1} \cdot \frac{1}{2} \cdot \frac{1}{1} \cdot \frac{1}{1}$ 5 $\bar{4}$ $\bar{1}8$ $\overline{6}$ -i-9 3 6 6 7 9 1 4 3 $\frac{1}{1}\frac{3}{2}$ _ + - ⊢ 7 7-3 $\bar{1}$ 5 6 $\frac{5}{5} - \frac{1}{2} - \frac{1}{4} = \frac{7}{4}$ $7^{-1} = \frac{1}{8} = \frac{1}{9}$

8

 $\operatorname{Col} \to$ Row 3 | 4 | 5 0 1 $\mathbf{2}$ 6 7 \downarrow $\frac{9}{8} + \frac{5}{1} - \frac{2}{6}$ i 8 0 -14 - 13 $\bar{2}$ 1 7.1 $\frac{5}{9} - \frac{1}{5} - \frac{5}{6}$ $\frac{3}{8} - \frac{1}{2}$ $\frac{3}{4} + \frac{1}{3} - \frac{3}{7}$ 2 3 3 + 1 + 42 | 9 | 6 5 | 7 | 8 -1-6 1 7 8 3 7 4 7 9 $\bar{7}$ 5 4 $\bar{1}4$ $\frac{1}{1}$ $\frac{1}{2}$ $\overline{5}$ $\sqrt{7}$ 5 3 6 6 5 1 3 $\frac{3}{1}$ 6 7 $^{-4}^{-}$ $\frac{1}{7} - \frac{1}{8} = \frac{1}{9}$ 8

 $Col \rightarrow$ Row 0 1 $\mathbf{2}$ 3 | 4 | 5 6 7 | 8 \downarrow + 3 8 7 2 6 4 9 $-\frac{9}{8} + \frac{1}{1} + \frac{5}{1} - \frac{2}{6}$ $\frac{3}{9} - \frac{1}{7} = \frac{7}{5}$ $\bar{2}^{-1}4^{-1}\bar{3}$ -1-5-+ $\stackrel{\dashv}{\cdot}$ $\stackrel{-}{1}$ $\bar{9}$ $-\vdash \bar{2}$ ⁺ ⁻ 3 2 $\bar{6}$ $\overline{4}$ -8 3 12 $\frac{3}{3} + 9 + 6$ 17 4 + 1 $\begin{bmatrix} \frac{1}{3} & \frac{1}{4} & \frac{1}{4} & \frac{3}{9} \end{bmatrix}$ 7 - 6 7 5 7.8 4 2 _ _ _ L $\frac{1}{1} \frac{2}{2} = \frac{3}{1}$ $\bar{3}$ $\bar{1}8$ $\frac{1}{1} \frac{7}{7}$ $\overline{6}$ 5 ı 9 $\overline{4}$ $\begin{array}{c|c} & & \hline & 8 & \hline & 5 \\ + & 9 & -1 & 5 \\ - & 9 & -1 & 4 \\ \hline - & c & - & - \end{array}$ $\frac{2}{7}$ 6 6 9 1 4 3 $\frac{\overline{8}}{\overline{5}}$ $-\frac{1}{3} - \frac{1}{4}$ $\frac{1}{1}$ $-\,^{\vdash}_{\vdash}\,\bar{6}$ 7 5 $7^{-\frac{1}{8}} = \frac{1}{9}$ 1 - 6 - 3

$\mathbf{Col} \to$ \mathbf{Row} $3 \mid 4 \mid 5$ 6 | 7 | 8 \downarrow 1 2 3 4 5 6 7 8

| | Col | \rightarrow | | | | | | | | |
|----------|-----|---------------|-----|-------------------------|---|-------------------------|-------------------|------------------|--------------------|----------|
| Row | | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| \ | 0 | 1 | 8 | 7 | 6 | 3 | 4 | 9 | 5 | 2 |
| | 1 | $\bar{2}$ | 4 | <u>-</u> 3 - | 9 | - 7 - | 5 | 8 | 1 | 6 |
| • | 2 | 9 - | 5 | $\bar{6}$ | 8 | $\lceil \bar{2} \rceil$ | 1^{-1} | $\overline{4}$ | † - 3 - | $ ^{-7}$ |
| • | 3 | 4 | · 1 | ı <u>5</u> | 2 | 9 | - 6 | 3 | ı 7 | 8 |
| • | 4 | 7 - | 6 | $\lceil \bar{2} \rceil$ | 3 | [ī - | 8 | 5 | $\frac{1}{4}$ | 9 |
| • | 5 | $\bar{3}$ | 9 | 8 | 4 | $\overline{5}$ | 7 | $\overline{6}$ | $\frac{1}{2}$ | 1 |
| | 6 | 6 | 7 | 9 | 1 | ¦ 4 | 3 | 2 | 8 | 5 |
| | 7 | 8 - | 3 | - ī ⁻ | 5 | $\bar{6}^{-}$ | $\frac{1}{2}^{-}$ | $^{-7}^{-}$ | 9 - | 4 |
| | 8 | 5 | 2 | $\bar{4}^-$ | 7 | $\lceil 8 \rceil$ | 9 | $1 \overline{1}$ | 6 | 3 |

| | Col | \rightarrow | | | | | | | | |
|----------|----------------|--------------------|-----|---|---|-------------------------|-----------------------------|-----------------------------------|---------------|-----------------------------------|
| Row | | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| + | 0 | 1 | 8 | 7 | 6 | 3 | 4 | 9 | 5 | 2 |
| | 1 | $\bar{2}^{-}$ | 4 | <u>-</u> <u>-</u> <u>-</u> | 9 | - 7 - | 5 | 8 | 1 | 6 |
| | 2 | 9 - | ¦-5 | $\stackrel{\scriptscriptstyle{+}}{\scriptscriptstyle{1}}$ $\stackrel{\scriptscriptstyle{6}}{\scriptscriptstyle{6}}$ $\stackrel{\scriptscriptstyle{-}}{\scriptscriptstyle{1}}$ | 8 | $\lceil \bar{2} \rceil$ | 11 | $\overline{4}$ | 3 - | 7 |
| | 3 | 4 | · 1 | ı <u>5</u> | 2 | ı 9 | - 6 | 3 | 1 7 | · 8 |
| | $\overline{4}$ | 7 - | 6 | $\lceil \bar{2} \rceil$ | 3 | [[| 8 | 5 | [4] | -9 |
| | 5 | $\bar{3}$ | 9 | $\overline{8}$ | 5 | $\bar{4}$ | 7 | $\begin{bmatrix} 6 \end{bmatrix}$ | $\frac{1}{2}$ | $\begin{bmatrix} 1 \end{bmatrix}$ |
| | 6 | 6 | 7 | ¦ 9 | 1 | 5 | 3 | 2 | 8 | 4 |
| | 7 | $\bar{8}^-$ | 3 | $\bar{1}$ | 4 | [6] | $\frac{1}{1}$ $\frac{1}{2}$ | $\overline{7}$ | 9 | $\begin{bmatrix} 5 \end{bmatrix}$ |
| | 8 | $\overline{5}^{-}$ | 2 | $\bar{4}$ | 7 | $\lceil 8 \rceil$ | 9 | 1 | 6 | 3 |

| ol | \rightarrow | | | | | | | | |
|----------|--|---|---|---|---|--|--|--|--|
| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 0 | 1 | 8 | 7 | 6 | 3 | 4 | 9 | 5 | 2 |
| 1 | $\bar{2}$ | 4 | $\bar{3}$ | 9 | 7 | 5 | 8 | 1 | $\begin{bmatrix} -6 \end{bmatrix}$ |
| 2 | 9 - | 5 | $\lceil ar{6} \rceil$ | 8 | $\lceil ar{2} \rceil$ | 1 | $\overline{4}$ | $\overline{3}^{-}$ | 7 |
| 3 | 5 | 1 | 4 | 2 | 9 | 6 | 3 | 7 | 8 |
| 4 | 7 | 6 | $\lceilar{2}\rceil$ | 3 | $\lceil \bar{1} \rceil$ | 8 | $\overline{5}$ | 4^{-1} | 9 |
| 5 | 3 | 9 | $\bar{8}$ | 5 | $\lceil 4 \rceil$ | 7 | $\overline{6}$ | $\frac{1}{2}$ | 1 |
| 6 | 6 | 7 | 9 | 1 | 5 | 3 | 2 | 8 | 4 |
| 7 | 8 - | 3 | $\bar{1}$ | $\overline{4}^{-}$ | $\bar{6}$ | $\overline{2}^{-}$ | $^{-7}^{-}$ | 9 - | $\overline{5}$ |
| 8 | $\overline{4}$ | 2 | $\bar{5}$ | 7 | $\overline{8}$ | 9 | $1 \overline{1}$ | 6 | 3 |
| | $egin{array}{c c} 0 & 1 & 2 & 3 & 4 & 5 & 6 & 7 & & & & & & & & & & & & & & & &$ | $ \begin{array}{c cccc} 0 & \frac{1}{1} & \frac{2}{2} \\ \hline 1 & \frac{2}{2} & \frac{9}{9} \\ \hline 3 & \frac{5}{7} & \frac{4}{3} \\ \hline 6 & \frac{6}{8} & \frac{6}{8} \\ \hline 7 & 8 & - \end{array} $ | $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | $\begin{array}{c c c c c c c c c c c c c c c c c c c $ | $\begin{array}{c c c c c c c c c c c c c c c c c c c $ | $\begin{array}{c c c c c c c c c c c c c c c c c c c $ | $\begin{array}{c c c c c c c c c c c c c c c c c c c $ |

| _ | Col | \rightarrow | | | | | | | | |
|----------|----------------|----------------|---------------|------------------------------|--------------------|------------------------------|--------------------|-----------------------------------|------------------------------------|---------------------------------|
| Row | | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| \ | 0 | 1 | 8 | 7 | 6 | 4 | 9 | 5 | 3 | 2 |
| | 1 | $\bar{2}$ | 4 | ī <u> </u> | 3 | $\lceil 7 \rceil$ | 5 | 8 | 1 | ·-6 |
| | 2 | $\bar{3}$ | 5 | $\frac{+6}{6}$ | 8 | $\lceil \bar{2} \rceil$ | 1 1 | $\overline{4}$ | 9 - | ¦ ⁻ 7 ⁻] |
| | 3 | 4 | · 1 | ⊢3 | 5 | 9 | - 6 | 2 | 7 | · 8 |
| | $\overline{4}$ | 7 - | 6 | $\lceil \bar{5} \rceil$ | $\overline{2}^{-}$ | $\lceil \overline{1} \rceil$ | 8 | $\overline{3}$ | $\begin{bmatrix} -4 \end{bmatrix}$ | [9] |
| | 5 | $\bar{9}$ | $\frac{1}{2}$ | $\bar{1}$ $\bar{8}$ $\bar{}$ | 4 | $\bar{3}$ | 7 | $\begin{bmatrix} 6 \end{bmatrix}$ | 5 | 1^{-1} |
| | 6 | 6 | 7 | $\frac{1}{1}$ 2 | 1 | 5 | 3 | 9 | 8 | 4 |
| | 7 | 8 | 3 | - ī - | 9 | $\bar{6}$ | $\overline{4}^{-}$ | 7 | $\frac{1}{2}^{-}$ | 5 |
| | 8 | $\overline{5}$ | 9 | $\bar{1} \bar{4}$ | 7 | $\bar{8}$ | 2 | $\lceil 1 \rceil$ | 6 | -3 |

$Col \rightarrow$ Row 3 1 4 **5** 6 7 \downarrow 7 2 8 6 4 9 5 3 0 $\frac{3}{3}$ $\frac{1}{7}$ $\frac{7}{7}$ $\frac{1}{5}$ 8 1 1 6 $\frac{1}{2} - \frac{1}{4} - \frac{1}{1} = \frac{1}{9}$ 1 7.7 -1-5-+ $-\frac{1}{2}$ ⁺ 9 2 $\bar{6}$ $\overline{4}$ 8 5 | 9 3 + <u>2</u> 4 + 1 3 + 6 7 ı 8 -1 $\begin{bmatrix} 7 & \overline{5} \\ 1 & \overline{8} \end{bmatrix}$ -,-6 - <u>-</u> <u>-</u> <u>-</u> 7 4 7 9 $\bar{7}$ 4 2 8 3 5 $\bar{9}$ ---2 $\bar{3}$ 6 $\frac{1}{1} \cdot \frac{5}{5} \cdot 1 \cdot 1$ $\overline{4}$ 3 $- \stackrel{|}{\downarrow} \frac{2}{1}$ 6 6 1 5 9 $\frac{1}{7} - \frac{4}{5}$ - ⊢ $\begin{bmatrix} 2 & + & 7 & - & 5 \\ 2 & + & 7 & + & 5 \\ 1 & + & 6 & + & 3 \end{bmatrix}$ 7 -|-3 9 6 $\frac{1}{1}$ $\frac{1}{5} - \frac{1}{9} - \frac{1}{4} = \frac{1}{4}$ $7^{-1} = 8$ $\overline{}$ $\overline{}$ 8

 $\mathbf{Col} \to$ Row $3 \mid 4 \mid$ 0 1 $\mathbf{2}$ 5 6 7 \downarrow $\overline{4}$ 8 9 0 6 $\frac{3}{3} - \frac{1}{7} = \frac{1}{5}$ -14 - 19 $\bar{2}$ 1 7.1 $\frac{3}{8}$ $\frac{1}{2}$ <u>3</u> -| 5 $\frac{3}{4} + \frac{1}{9} - \frac{3}{7}$ 2 $\overline{6}$ 3 4 + 1 + 52 | 9 | 6 3 + 7 + 87 -1-6 $\lceil \bar{3} \rceil$ 1 7 8 5 $\bar{2}$ 7 4 1 9 4 18 6 $\frac{1}{2}$ $\bar{1}\bar{3}$ $\frac{1}{1}$ $\frac{1}{5}$ 5 $\bar{9}$ 4 <u></u> 3 6 5 9 1 $\frac{3}{7} + \frac{8}{1} + \frac{4}{5}$ 6 7 9 $\frac{1}{4}$ $\frac{1}{7} - \frac{1}{8} = \frac{1}{2}$ 76-13 8 1

 $Col \rightarrow$ Row 0 1 $\mathbf{2}$ $3 \mid 4 \mid$ 5 6 7 \downarrow 8 7 2 6 4 9 $-\frac{5}{8} + \frac{3}{1} - \frac{2}{6}$ $\frac{3}{3} - \frac{1}{7} + \frac{5}{5}$ $\bar{2}^{-1}4^{-1}\bar{9}$ $^{\dashv}$ $\bar{1}$ ⁺ 9 $\bar{3}$ -1-5 $\overline{6}$ $\frac{1}{2}$ $\overline{\mathbf{2}}$ $\bar{4}$ 8 3 +9+6 3 5 + 1 ı 4 2 - - 1 $\begin{bmatrix} \frac{1}{2} & \frac{1}{4} & \frac{1}{9} \\ \frac{1}{6} & \frac{1}{5} & 1 \end{bmatrix}$ $\frac{3}{7} - \frac{1}{1} - 6 - \frac{7}{1} = \frac{3}{3}$ 7.8 5 4 _ L $\bar{9}$ -i-2- $\bar{1}8$ $\bar{3}$ $\frac{1}{1} \frac{7}{7}$ 5 $\overline{4}$ $\frac{2}{1}$ 3 6 6 1 5 9 $+\frac{6}{2} - 1 - \frac{4}{5}$ $\bar{8}$ $\bar{6}$ $\frac{1}{1}$ $\frac{1}{4}$ -|-3 7 9 $-\frac{1}{9}$ $-\frac{1}{5}$ $\frac{1}{1} + \frac{2}{6} + \frac{3}{3}$ $7^{-\frac{1}{1}}\frac{8}{8}$ $\bar{4}$ $\overline{}$ $\overline{}$

 $Col \rightarrow$ Row 3 1 4 **5** 6 7 \downarrow 7 8 6 4 9 5 3 0 $\frac{3}{3}$ $\frac{1}{7}$ $\frac{7}{7}$ $\frac{1}{5}$ 8 1 1 6 $\frac{1}{2} - \frac{1}{9} - \frac{1}{4}$ 1 7.7 -1-5-+ $-\frac{1}{2}$ ⁺ 9 2 $\bar{6}$ $\overline{4}$ 8 $\frac{1}{1} \frac{7}{7} \frac{8}{1} \frac{8}{2} \frac{1}{1} \frac{1}{1}$ 3 2 4 + 1 3 5 + 9 + 6 -1 $\begin{bmatrix} 7 & \overline{5} \\ 1 & \overline{8} \end{bmatrix}$ $\lceil \overline{1} \rceil$ $\bar{7}$ $\bar{3}$ 6 2 8 4 5 $\bar{9}$ ---2 $\bar{3}$ 6 $\overline{4}$ 3 - + 1 1 6 6 1 5 - ⊢ 7 7-3 9 6 $\frac{1}{1}$

 $\frac{5}{5} - \frac{1}{4} - \frac{1}{9} = \frac{5}{9}$

8

2

 $\mathbf{Col} \to$ Row $3 \mid 4 \mid$ 0 1 $\mathbf{2}$ 5 6 7 \downarrow $\overline{4}$ 8 9 6 $\frac{3}{3} - \frac{1}{7} = \frac{1}{5}$ -1-9 $-\frac{1}{4}$ $\bar{2}$ 1 7.7 $\frac{8}{8}$ $+\frac{1}{2}$ -1-5 $\frac{3}{4} + \frac{1}{9} - \frac{3}{7}$ $\bar{3}$ 2 $\overline{6}$ 3 4 | 1 + 3 5 | 9 | 6 7 +2 + 8 $\frac{1}{5}$ 7 - 6 7.8 3 7 4 7 9 2 4 18 $\bar{1}\bar{3}$ $\frac{1}{1}$ $\frac{1}{5}$ 5 $\bar{9}$ 4 6 6 7 1 8 1 3 1 $\frac{9}{2} + \frac{8}{7} + \frac{4}{5}$ $\frac{2}{\bar{1}}$ 6 5 1 3 6 7 9 $\frac{1}{4}$ $\frac{3}{5} - \frac{3}{4} - \frac{1}{9}$ - 6 - 3 $\frac{1}{7} - \frac{1}{8} = \frac{1}{2}$ 1 8

 $7^{-1} = 8$

 $\overline{}$ $\overline{}$

 $Col \rightarrow$ Row 0 1 $\mathbf{2}$ $3 \mid 4 \mid$ 5 6 7 \downarrow 8 2 7 6 4 9 $-\frac{5}{8} + \frac{3}{1} - \frac{2}{6}$ $\frac{3}{3} - \frac{1}{7} + \frac{5}{5}$ $\overline{2}$ $\overline{9}$ $\overline{4}$ $^{\dashv}$ $\bar{1}$ ⁺ 9 $\bar{3}$ -1-5 $\frac{1}{2}$ $\bar{6}$ $\overline{\mathbf{2}}$ $\bar{4}$ 8 3 1 5 +9+6 4 + 1 2 3 - - 1 $\begin{bmatrix} \frac{1}{2} & \frac{1}{4} & \frac{1}{9} \\ \frac{1}{6} & \frac{1}{5} & 1 \end{bmatrix}$ $\frac{1}{7} - \frac{1}{1} - 6 - \frac{1}{1} = \frac{3}{3}$ 7.8 5 4 _ L $\bar{9}$ -i-2- $\bar{1}8$ $\bar{3}$ 5 $\overline{4}$ 1 $\frac{2}{1}$ 3 6 1 5 9 $\frac{\overline{8}}{\overline{5}}$ $-\frac{1}{4}$ $-\frac{1}{9}$ $\bar{6}$ $\frac{1}{1}$ 7 9 $7^{-\frac{1}{1}}\frac{8}{8}$ $\overline{}$ $\overline{}$

 $Col \rightarrow$ Row $3 \mid 4 \mid$ 1 **5** 6 7 \downarrow 2 9 3 6 4 5 8 $\mathbf{0}$ $\frac{1}{9}$ $\frac{1}{7}$ $\frac{1}{7}$ $\frac{1}{5}$ $\frac{3}{3} + \frac{1}{1} + \frac{5}{1} - \frac{1}{6}$ $\frac{1}{2} - \frac{1}{4} - \frac{1}{8} = \frac{1}{8}$ 1 7.7 -1-5-+ $-\vdash \bar{2}$ [†] 9 $\bar{3}$ 2 $\bar{6}$ $\overline{4}$ 8 3 2 +9+6 4 + 1 3 7 ı <u>5</u> ı 8 - 1 $\begin{smallmatrix} \mathsf{T} & \bar{3} \\ \mathsf{L} & \bar{5} \end{smallmatrix}$ $\overline{}$ $\overline{4}$ -,-6 ⁻1 $\bar{7}$ 8 $\bar{2}$ 4 5 $\frac{1}{3} \frac{4}{1} \frac{9}{1}$ 6 -1-8 5 $\bar{9}$ 2 $\bar{1}4$ 6 6 7 9 1 5 3 8 $\frac{1}{1}\frac{3}{2}$ _ _ $\frac{6}{9} + \frac{2}{7} - \frac{4}{5}$ _ + 7 -|-3 $\bar{1}$ 4 6 $\frac{1}{5} - \frac{1}{1} - \frac{1}{2} - \frac{1}{1}$ $7^{-1} = \frac{1}{8} = \frac{1}{9}$

 $\bar{4}$

8

1 - 6 - 3

 $\operatorname{Col} \to$ Row 3 | 4 | 5 0 1 $\mathbf{2}$ 6 7 8 \downarrow · 9 0 -1-4- 1-8 $\bar{2}$ 1 7.1 $\frac{3}{8} - \frac{1}{2}$ <u>3</u> -| 5 $\frac{3}{4} + \frac{1}{9} - \frac{3}{7}$ 2 $\bar{6}$ 3 4 | 1 12 5 | 9 | 6 7 | 3 | 8 $\bar{5}$ 7 - 6 $[1, \frac{1}{8}]$ $\bar{2}$ 7 4 - 1 - 9 4 3 i 8 6 $\bar{1} \bar{3}$ 2 $\bar{1}4$ $\sqrt{7}$ $\frac{1}{1} \frac{1}{5}$ 5 $\bar{9}$ 6 | 7 | 8 | 3 | 6 9 5 8 1 3 $\frac{1}{2}$ $+\frac{2}{7}$ 6 $\bar{1}$ 7 9 $^{-4}^{-}$ $\frac{5}{5} - \frac{1}{2} - \frac{1}{4}$ 1 - 6 - 3 $\frac{1}{7} - \frac{1}{8} = \frac{1}{9}$ 8

 $Col \rightarrow$ Row 7 | 8 0 1 $\mathbf{2}$ 3 | 4 | 5 6 \downarrow 3 9 7 6 4 5 2 $-\frac{5}{3} + \frac{1}{1} + \frac{8}{1} - \frac{2}{6}$ $\frac{3}{9} - \frac{1}{7} = \frac{7}{5}$ $\bar{2}^{-1}4^{-1}8$ $^{\dashv}$ $\bar{1}$ ⁺ 9 $\bar{3}$ -1-5 $\overline{6}$ $-\vdash \bar{2}$ $\overline{\mathbf{2}}$ $\overline{4}$ 8 3 + 3 +9+6 4 + 1 2 7 _ _ _ 5 7.8 4 -3 4 $\bar{9}$ $\bar{2}$ 5 ı 8 1 -1 $\begin{array}{c|c} & \overline{} & 5 \\ + & \overline{} & -1 & 5 \\ + & \overline{} & -1 & 4 \\ \hline + & \overline{} & -1 & -1 \end{array}$ 6 6 9 1 4 3 8 $-1 - \frac{1}{3} - \frac{1}{4}$ $\frac{\overline{8}}{\overline{5}}$ $\frac{1}{1}$ -69 7 5 $\frac{1}{1} + \frac{1}{6} + \frac{1}{3}$ $7^{-\frac{1}{8}} = \frac{1}{9}$

| 8 |
|---|
| 2 |
| 6 |
| 7 |
| 8 |
| 9 |
| 1 |
| 4 |
| 5 |
| 3 |
| |

| _ | Col | \rightarrow | | | | | | | | |
|--|-----|----------------|-----|-------------------------|---|-------------------------|-----------------------------|-----------------------------------|------------------------------------|-----------------------------------|
| $egin{array}{c} { m Row} \ \downarrow \end{array}$ | | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 4 | 0 | 1 | 9 | 7 | 6 | 3 | 4 | 5 | 8 | 2 |
| | 1 | $\bar{2}$ | 4 | ī <u>8</u> - | 9 | - 7 - | 5 | 3 | 1 | · 6] |
| | 2 | $\bar{3}$ | 5 | $\frac{1}{6}$ | 8 | $\lceil \bar{2} \rceil$ | '1- | $\overline{4}$ | 9 - | 7 |
| | 3 | 5 | · 1 | ı 4 | 2 | ı 9 | □ 6 | 7 | · 3 | ı 8 |
| | 4 | 7 - | 6 | $\lceil \bar{3} \rceil$ | 5 | [1 | 8 | $\overline{2}$ | $\begin{bmatrix} -4 \end{bmatrix}$ | [9] |
| | 5 | $\bar{9}$ | 18 | $\bar{2}$ | 3 | $\bar{4}$ | 7 | $\begin{bmatrix} 6 \end{bmatrix}$ | $\overline{5}^{-}$ | 1] |
| | 6 | 6 | 7 | 9 | 1 | 5 | 3 | 8 | 2 | 4 |
| | 7 | $\bar{8}^{-}$ | 3 | $\bar{1}$ | 4 | $\bar{6}$ | $\frac{1}{1}$ $\frac{1}{2}$ | 9 | 7 | $\begin{bmatrix} 5 \end{bmatrix}$ |
| | 8 | $\overline{4}$ | 12 | $\bar{5}$ | 7 | [8] | 9 | 1 | 6 | 3 |

 $\mathbf{Col} \to$

 $\mathbf{Row} \\ \downarrow$

| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|--------------------|-----|---|---|-------------------------|-------------------|----------------|--------------------|---------------------------------|
| 0 | 1 | 9 | 7 | 6 | 3 | 4 | 5 | 8 | 2 |
| 1 | $\bar{2}^{-}$ | | 8 - | " | $\lceil 7 \rceil$ | 5 | 3 | | '-6 |
| 2 | $\overline{6}$ | 5 | $\bar{3}$ | 8 | $\lceil \bar{2} \rceil$ | 1 1 | $\overline{4}$ | 7 9 - | ¦ ⁻ 7 ⁻] |
| 3 | 4 | · 1 | · 2 | 5 | 9 | - 6 | 7 | · 3 | · 8 |
| 4 | 7 - | () | $\left[\begin{array}{cc}ar{5}\end{array} ight]$ | 3 | 「ī ⁻ | 8 | 2 | $\frac{1}{4}$ | -9 |
| 5 | $\bar{3}$ | 8 | $-\frac{1}{9}$ | 2 | $\bar{4}$ | 7 | $\overline{6}$ | $\overline{5}^{-}$ | 1^{-1} |
| 6 | 9 | ¦ 7 | 6 | 1 | 5 | 3 | 8 | 2 | 4 |
| 7 | $\bar{8}^-$ | 3 | $\bar{1}$ | 4 | $\bar{6}^{-}$ | $\frac{1}{2}^{-}$ | 9 | 7 - | 5 |
| 8 | $\overline{5}^{-}$ | 2 | $[\ ar{4}\ ^-$ | 7 | $\lceil 8 \rceil$ | 9 | 1 | 6 | |

 $\mathbf{Col} \to$

 $\mathbf{Row} \\ \downarrow$

| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|-------------------------|-----|--------------------------|---------|---------------------------|--------------------|-----------------------------------|---|-----|
| 0 | 1 | 9 | 7 | 6 | 3 | 4 | 5 | 8 | 2 |
| 1 | $\bar{2}^{-}$ | 8 | $\bar{4}$ | 9 | $\lceil 7 \rceil$ | 5 | $\overline{3}$ | 1 | 6 |
| 2 | $\bar{3}$ | 5 | $\lceil \bar{6} \rceil$ | 8 | $\lfloor \bar{2} \rfloor$ | 1 1 | $\overline{4}$ | † - | -7- |
| 3 | 4 | · 1 | | 2 | 9 | - 6 | | ı <u>5</u> | · 8 |
| 4 | 7 - | 6 | $\lceil ar{5} \rceil$ | 3 | [[| 8 | $\overline{2}$ | [4] | 9 |
| 5 | $\lceil \bar{9} \rceil$ | 2 | $\overline{8}$ | 4^{-} | $\bar{5}$ | $\overline{7}^{-}$ | $\begin{bmatrix} 6 \end{bmatrix}$ | $\overline{3}^{-}$ | 1 |
| 6 | 6 | 7 | 9 | 1 | ¦ 4 | 3 | 8 | $\frac{1}{1}$ 2 | 5 |
| 7 | $\bar{8}^-$ | 3 | $\bar{1}$ | 5 | $\bar{6}$ | $\frac{1}{2}$ | 9 | 7 | 4 |
| 8 | $\bar{5}^{-}$ | 4 | $\bar{2}$ | 7 | · 8 - | 9 | $\lceil 1 \rceil$ | 6 | -3 |

$\mathbf{Col} \to$ \mathbf{Row} 3 | 4 | 5 | 6 | 7 | 8 \downarrow

6 6 7 9 7 8 3 1 1 2 8 5 1 4 1 2 1 6 3

 $\frac{3}{4} + \frac{1}{9} - \frac{3}{7}$

$\mathbf{Col} \to$

 \mathbf{Row} \downarrow

| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|--------------------|-----|-------------------------------|-----|------------------------------|-----------------------------|----------------|---------------|-----|
| 0 | 1 | 9 | 7 | 6 | 3 | 4 | 5 | 8 | 2 |
| 1 | ~ | ! 8 | $\bar{4}$ | 9 | $\lceil 7 \rceil$ | 5 | 3 | 1 | · 6 |
| 2 | $\bar{3}$ | 5 | $\lceil \bar{6} \rceil$ | 8 | $\lceil \bar{2} \rceil$ | 11 | $\overline{4}$ | 9 - | 7 |
| 3 | 4 | · 1 | ı <u>5</u> | 2 | · 9 | □ 6 | 7 | _ | · 8 |
| 4 | 7 - | 6 | $\lceil \bar{3} \rceil$ | 5 | [1 | 8 | 2 | $\frac{1}{4}$ | -9 |
| 5 | $\bar{9}$ | 2 | $\bar{8}$ | 3 | $\bar{4}$ | 7 | $\overline{6}$ | 5 | 1 |
| 6 | 6 | ¦ 7 | 9 | 1 1 | _ 5 | 1 3 | 8 | 2 | 4 |
| 7 | $\bar{8}^-$ | 3 | - ī ⁻ | | $\bar{6}$ | $\frac{1}{1}$ $\frac{1}{2}$ | 9 | 7 - | 5 |
| 8 | $\overline{5}^{-}$ | 4 | $\bar{1}$ $\bar{2}$ $\bar{2}$ | 7 | $\lceil \overline{8} \rceil$ | 9 | 1 | 6 | -3 |

$\mathbf{Col} \to$

 \mathbf{Row} \downarrow

| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|--------------------|---------------|---|--------------------|---------------------------|---------------|-----------------------------------|---|---------|
| 0 | 1 | 9 | 7 | 6 | 3 | 4 | 8 | 5 | 2 |
| 1 | $\bar{2}^{-}$ | 4 | <u>-</u> 8 - | 9 | . • | 5 | $\overline{3}$ | 1 | 6 |
| 2 | $\bar{3}$ | ¦-5 | $\stackrel{+}{\scriptstyle 6}$ $\stackrel{-}{\scriptstyle 6}$ | 8 | $\lfloor \bar{2} \rfloor$ | 1 1 | $\overline{4}$ | † - | 7 |
| 3 | 4 | · 1 | · 2 | 5 | 9 | - 6 | 7 | · 3 | 8 |
| 4 | 7 - | 6 | $\lceil \bar{3} \rceil$ | $\overline{2}^{-}$ | [[| 8 | $\overline{5}$ | [4] | 9 |
| 5 | $\bar{9}$ | 8 | $\bar{5}$ | 3 | $\bar{4}$ | 7 | $\begin{bmatrix} 6 \end{bmatrix}$ | $\frac{1}{2}$ | 1 |
| 6 | 6 | 7 | ¦ 9 | 1 | 5 | 3 | 2 | 8 | 4 |
| 7 | $\bar{8}^-$ | 3 | ī ī ⁻ | $\overline{4}^{-}$ | $\bar{6}$ | $\frac{1}{2}$ | 9 | 7 - | 5^{-} |
| 8 | $\overline{5}^{-}$ | $\frac{1}{2}$ | $\bar{4}^-$ | 7 | $\lceil 8 \rceil$ | 9 | 1 | 6 | 3 |

$\begin{array}{c} \operatorname{Col} \to \\ \operatorname{Row} \\ \downarrow \\ \begin{array}{c} 0 & 1 \\ \hline 0 & 1 & 9 \end{array} \end{array}$

 $\operatorname{Col} o$

 $\mathbf{Row} \\ \downarrow$

| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|--------------------|-----|-------------------------|---|-------------------------|-------------------|----------------|--------------------|---|
| 0 | 1 | 9 | 7 | 6 | 3 | 4 | 8 | 5 | 2 |
| 1 | $\bar{2}^{-}$ | 4 | $\bar{8}^{-}$ | 9 | $\lceil 7 \rceil$ | 5 | $\overline{3}$ | 1 | 6 |
| 2 | $\bar{3}$ | 5 | $\lceil ar{6} \rceil$ | 8 | $\lceil \bar{2} \rceil$ | 1 1 | $\overline{4}$ | 9 - | 7 |
| 3 | 4 | · 1 | · 5 | 2 | 9 | - 6 | 7 | · 3 | 8 |
| 4 | 7 - | 6 | $\lceil ar{2} \rceil$ | 3 | 「ī ⁻ | 8 | 5 | $\frac{1}{4}$ | 9 |
| 5 | 9 - | 8 | $\bar{3}$ | 4 | $\overline{5}$ | 7 | $\overline{6}$ | $\overline{2}^{-}$ | 1 |
| 6 | 6 | 7 | 9 | 1 | ¦ 4 | 3 | 2 | 8 | 5 |
| 7 | $\bar{8}^-$ | 3 | ī ī ⁻ | 5 | $\bar{6}^{-}$ | $\frac{1}{2}^{-}$ | 9 - | 7 | 4 |
| 8 | $\overline{5}^{-}$ | 2 | $[\ ar{4}\]$ | 7 | $\lceil 8 \rceil$ | 9 | 1 | 6 | 3 |

 $\mathbf{Col} \to$

 $\mathbf{Row} \\ \downarrow$

| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---------------|-----|-------------------------|---|---------------------------|---------------|-------------------|---------------|---|
| 0 | 1 | 9 | 7 | 6 | 3 | 4 | 8 | 5 | 2 |
| 1 | $\bar{2}^{-}$ | 4 | 8 - | 9 | $\lceil 7 \rceil$ | 5 | $\overline{3}$ | 1 | 6 |
| 2 | $\bar{3}$ | 5 | $\lceil \bar{6} \rceil$ | 8 | $\lfloor \bar{2} \rfloor$ | 1 1 | $\overline{4}$ | 9 - | 7 |
| 3 | 4 | · 1 | · 5 | 2 | 9 | - 6 | 7 | · 3 | 8 |
| 4 | 7 - | 6 | $\lceilar{2}\rceil$ | 3 | [[| 8 | $\overline{5}$ | [4] | 9 |
| 5 | $\bar{9}$ | 8 | $\bar{3}$ | 5 | $\bar{4}$ | 7 | $\overline{6}$ | $\frac{1}{2}$ | 1 |
| 6 | 6 | 7 | 9 | 1 | 5 | 3 | 2 | 8 | 4 |
| 7 | $\bar{8}^-$ | 3 | $\bar{1}$ | 4 | $\bar{6}$ | $\frac{1}{2}$ | 9 | 7 | 5 |
| 8 | $\bar{5}^{-}$ | 2 | $\bar{4}$ | 7 | $\lceil 8 \rceil$ | 9 | $\lceil 1 \rceil$ | 6 | 3 |

 $\begin{array}{c} \operatorname{\mathbf{Col}} \to \\ \operatorname{\mathbf{Row}} & \begin{array}{c|c} 0 & 1 \\ \hline 0 & \frac{1}{2} & \frac{9}{4} \end{array} \end{array}$

3 _ | 2 6 4 8 $\frac{1}{2} - \frac{1}{4} - \frac{1}{8} = \frac{1}{8}$ $\frac{1}{9}$ $\frac{1}{7}$ $\frac{7}{5}$ 3 1 1 6 ¬ --1-5-+ $\frac{1}{8}$ $\frac{1}{2}$ + 9 -1-7 $\bar{6}$ $\overline{4}$ 3 | 9 | 6 3 + 5 12 18 4 - 1 $\begin{smallmatrix} \mathsf{T} & \bar{3} \\ \mathsf{L} & \bar{2} \end{smallmatrix}$ $\frac{3}{8}$ $\begin{bmatrix} 5 & 7 & 4 & -1 & 9 \\ 6 & 1 & 3 & 1 & 1 \end{bmatrix}$ -1-6 $\bar{7}$ $\overline{2}$ 4 - L - _ -1-8 5 $\bar{9}$ $\frac{1}{1}\frac{3}{2}$ 6 1 $^{\mathsf{T}}4$ 5 L 6 7 7--8--9 1 6 7 3

 $3 \mid 4 \mid$

5

6

7 | 8

 $\operatorname{Col} o$

 $\mathbf{Row} \downarrow$

 $1 \mid 2$ $3 \mid 4 \mid 5$ 6 7 1 $\frac{3}{4} + \frac{1}{9} - \frac{3}{7}$ $\frac{1}{3}$ $\frac{1}{1}$ $\frac{1}{5}$ $\frac{1}{1}$ $\frac{6}{6}$ 2 3 4 | 1 | 5 3 | 9 | 6 7 | 2 | 8 $\begin{bmatrix} 1 & \frac{1}{8} \\ \frac{1}{4} & \frac{7}{7} \end{bmatrix}$ 5 7 4 9 $\frac{1}{3} \frac{4}{3} - \frac{3}{1} \frac{3}{1}$ 5 6 $\frac{2}{9} \stackrel{|}{+} \frac{8}{7} \stackrel{|}{-} \frac{4}{5}$ 6 7 1 6 - 3

 $\mathbf{Col} \to$

Row ↓

| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---------------|-----|-------------------------|--------------------|-------------------------|--------------------|-----------------------------------|---------------|---|
| 0 | 1 | 9 | 7 | 6 | 3 | 4 | 8 | 5 | 2 |
| 1 | $\bar{2}^{-}$ | 4 | 8 - | 9 | $\bar{7}$ | | $\overline{3}$ | 1 | 6 |
| 2 | $\bar{3}$ | 5 | $\lceil \bar{6} \rceil$ | 8 | $\lceil \bar{2} \rceil$ | 1 | $\overline{4}$ | 9 - | 7 |
| 3 | 5 | · 1 | 2 | | 9 | 6 | 7 | | 8 |
| 4 | 7 - | 6 | $\lceil ar{3} \rceil$ | $\overline{2}^{-}$ | $\lceil \bar{1} \rceil$ | 8 | -5 - | [4] | 9 |
| 5 | $\bar{9}$ | 8 | $\bar{4}$ | 3 | $\bar{5}$ | 7 | $\begin{bmatrix} 6 \end{bmatrix}$ | $\frac{1}{2}$ | 1 |
| 6 | 6 | 7 | 9 | 1 | 4 | 3 | 2 | 8 | 5 |
| 7 | $\bar{8}^-$ | 3 | $\bar{1}$ | 5 | $\bar{6}$ | $\overline{2}^{-}$ | 9 | 7 | 4 |
| 8 | $\bar{4}^-$ | 2 | $\bar{5}$ | 7 | 8 | 9 | $\lceil 1 \rceil$ | 6 | 3 |

 $\begin{array}{c|c} & \text{Col} \rightarrow \\ \text{Row} & \downarrow & \begin{array}{c|c|c} & 0 & 1 & 2 & 3 & 4 \\ \hline 0 & \frac{1}{2} & \frac{9}{4} & \frac{7}{8} & \frac{6}{9} & \frac{3}{7} & \frac{1}{2} \\ \hline \frac{1}{2} & \frac{2}{3} & \frac{1}{5} & \frac{6}{6} & \frac{8}{8} & \frac{12}{2} \end{array}$

___3 _ | 2 6 4 8 $\frac{1}{9}$ $\frac{1}{7}$ $\frac{7}{5}$ 3 1 1 6 ¬ --1-5-+ $\frac{1}{8}$ $\frac{1}{2}$ $\overline{4}$ 3 5 + 1 + 3 +9+6 12 18 4 $\begin{smallmatrix} \mathsf{T} & \bar{2} \\ \mathsf{L} & \bar{4} \end{smallmatrix}$ $\begin{bmatrix} 1 \\ 5 \end{bmatrix}$ $\frac{3}{8}$ $\begin{bmatrix} 5 & 7 & 4 & -1 & 9 \\ 6 & 1 & 3 & 1 & 1 \end{bmatrix}$ $\bar{7}$ -1-6 3 -1-8 5 $\bar{9}$ 2 $\frac{1}{1}\frac{3}{2}$ 6 1 $^{\mathsf{T}}4$ 5 L 6 7 7--8--9 1 6 7 3

5

7

6

 $\mathrm{Col}
ightarrow$

Row ↓

 $1 \mid 2$ $3 \mid 4 \mid 5$ 6 7 $\frac{1}{2} \stackrel{|}{\cancel{-}} \frac{9}{\cancel{-}} \stackrel{|}{\cancel{-}} \frac{7}{8}$ 1 $\frac{3}{4} + \frac{1}{9} - \frac{3}{7}$ $\frac{1}{3}$ $\frac{1}{1}$ $\frac{1}{5}$ $\frac{1}{1}$ $\frac{6}{6}$ 2 3 5 + 1 + 42 | 9 | 6 7 | 3 | 8 $\begin{array}{c|c} 3 & \hline 1 & \overline{8} \\ \hline 4 & 5 & 7 \end{array}$ 5 7 4 9 $\frac{1}{1} \frac{4}{2} - \frac{3}{1} \frac{3}{1}$ 6 $\frac{2}{9} \stackrel{|}{+} \frac{8}{7} \stackrel{|}{-} \frac{5}{4}$ 6 7 1 6 - 3

 $\operatorname{Col} \to$

 $\mathbf{Row} \\ \downarrow$

| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|----------------|---------------|-----|-------------------------|---|-------------------------|---------------|-----------------------------------|---------------|---|
| 0 | 1 | 9 | 7 | 6 | 3 | 4 | 8 | 5 | 2 |
| 1 | $\bar{2}^{-}$ | 4 | 8 - | 9 | $\bar{7}$ | . • | $\overline{3}$ | 1 | 6 |
| 2 | $\bar{3}$ | 5 | $\lceil \bar{6} \rceil$ | 8 | $\lceil \bar{2} \rceil$ | 1 1 | $\overline{4}$ | 9 - | 7 |
| 3 | 5 | · 1 | · 4 | 2 | 9 | - 6 | 7 | | 8 |
| $\overline{4}$ | 7 - | 6 | $\lceilar{2}^{-}$ | 3 | $\lceil \bar{1} \rceil$ | 8 | -5 - | [4] | 9 |
| 5 | $\bar{9}$ | 8 | $\bar{3}$ | 5 | $\bar{4}$ | 7 | $\begin{bmatrix} 6 \end{bmatrix}$ | $\frac{1}{2}$ | 1 |
| 6 | 6 | 7 | 9 | 1 | 5 | 3 | 2 | 8 | 4 |
| 7 | $\bar{8}^-$ | 3 | $\bar{1}$ | 4 | $\bar{6}$ | $\frac{1}{2}$ | 9 | 7 | 5 |
| 8 | $\bar{4}^-$ | 2 | $\bar{5}$ | 7 | 8 | 9 | 1 | 6 | 3 |

| Col | \rightarrow | | | | | | | | |
|-----|--|---|--|--|--|--|--|--|--|
| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 0 | 1 | 9 | 7 | 6 | 3 | 4 | 8 | 5 | 2 |
| 1 | $\bar{2}^{-}$ | 4 | 8 - | 9 | $\overline{7}$ | 5 | $\overline{3}$ | 1 | $\begin{bmatrix} -6 \end{bmatrix}$ |
| 2 | 3 - | 5 | $\frac{+}{6}$ $^{-}$ | 8 | $\lceil \bar{2} \rceil$ | 1 | $\overline{4}$ | 9 - | 7 |
| 3 | 5 | · 1 | ı <u>4</u> | 3 | 9 | 6 | 7 | · 2 | 8 |
| 4 | 7 - | 6 | $\lceil \bar{3} \rceil$ | $\overline{2}^{-}$ | $\lceil 1 \rceil$ | 8 | 5 | $\frac{1}{4}$ | 9 |
| 5 | 9 - | 8 | $\bar{2}$ | 5 | $\bar{4}$ | 7 | $\overline{6}$ | 3 | 1 |
| 6 | 6 | 7 | 9 | 1 | 5 | 3 | 2 | 8 | 4 |
| 7 | 8 - | 3 | - ī ⁻ | $\overline{4}^{-}$ | $\bar{6}$ | $\overline{2}^{-}$ | 9 | 7 | $\overline{5}$ |
| 8 | $\overline{4}^{-}$ | 2 | $\bar{5}^{-}$ | 7 | $\overline{8}$ | 9 | 1 | 6 | 3 |
| | $egin{array}{c} 0 \\ 1 \\ 2 \\ 3 \\ 4 \\ \hline 5 \\ 6 \\ 7 \\ \hline \end{array}$ | $\begin{array}{c cccc} 0 & 1 \\ \hline 1 & 2 \\ 2 & 3 \\ \hline 3 & 5 \\ 4 & 7 \\ \hline 5 & 9 \\ \hline 6 & 6 \\ 7 & 8 \\ \end{array}$ | $\begin{array}{c c c} & 0 & 1 \\ \hline 0 & \frac{1}{2} - \frac{9}{4} \\ \hline 2 & \frac{3}{3} - \frac{5}{5} \\ \hline 3 & \frac{5}{7} - \frac{1}{6} \\ \hline 5 & \frac{9}{9} - \frac{8}{8} \\ \hline 6 & \frac{6}{8} - \frac{7}{7} \\ \hline 7 & \frac{8}{8} - \frac{3}{3} \\ \hline \end{array}$ | $\begin{array}{c c c c c c c c c c c c c c c c c c c $ | $\begin{array}{c c c c c c c c c c c c c c c c c c c $ | $\begin{array}{c c c c c c c c c c c c c c c c c c c $ | $\begin{array}{c c c c c c c c c c c c c c c c c c c $ | $\begin{array}{c c c c c c c c c c c c c c c c c c c $ | $\begin{array}{c c c c c c c c c c c c c c c c c c c $ |

| | Col | \rightarrow | | | | | | | | |
|----------------|-----|----------------|-----|-------------------------|--------------------|-------------------------|-----------------------------|-----------------------------------|--------------------|-----------------------------------|
| \mathbf{Row} | | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| \ | 0 | 1 | 9 | 7 | 6 | 3 | 4 | 8 | 5 | 2 |
| | 1 | $\bar{2}$ | 4 | ī <u>8</u> - | 9 | - 7 - | 5 | 3 | 1 | · ⁻ 6 |
| | 2 | $\overline{6}$ | ¦-5 | $\bar{3}^{-}$ | 8 | $\lceil \bar{2} \rceil$ | 17 | $\overline{4}$ | 9 - | [7] |
| | 3 | 3 | · 1 | ı 4 | 5 | - 9 | □ 6 | 7 | 2 | · 8 |
| | 4 | 7 - | 6 | $\lceil \bar{2} \rceil$ | 3 | [ī- | 8 | 5 | [4] | -9 |
| | 5 | $\bar{5}$ | 8 | $-\frac{1}{9}$ | $\overline{2}^{-}$ | $\bar{4}$ | $\overline{7}$ | $\begin{bmatrix} 6 \end{bmatrix}$ | $\overline{3}^{-}$ | 1 |
| | 6 | 9 | 7 | 6 | 1 | 5 | 3 | 2 | 8 | 4 |
| | 7 | 8 - | 3 | ī ī ⁻ | $\overline{4}^{-}$ | $\bar{6}$ | $\frac{1}{1}$ $\frac{1}{2}$ | 9 | 7 | $\begin{bmatrix} 5 \end{bmatrix}$ |
| | 8 | $\overline{4}$ | 2 | $\lceil \bar{5} \rceil$ | 7 | $\lceil 8 \rceil$ | 9 | 1 | 6 | 3 |

| | Col | \rightarrow | | | | | | | | |
|-----|-----|----------------|-----|-------------------------|--------------------|-------------------------|--------------------|----------------|--------------------|------------------------------------|
| Row | | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| + | 0 | 1 | 9 | 7 | 6 | 3 | 4 | 8 | 5 | 2 |
| • | 1 | $\bar{2}^{-}$ | 4 | 8 - | 9 | $\overline{7}$ | 5 | $\overline{3}$ | 1 | $\begin{bmatrix} -6 \end{bmatrix}$ |
| | 2 | $\overline{6}$ | 5 | $\bar{3}$ | 8 | $\lceil \bar{2} \rceil$ | 1 | $\overline{4}$ | 9 - | 7 |
| • | 3 | 4 | · 1 | ı <u>5</u> | 2 | 9 | 6 | 7 | · 3 | 8 |
| | 4 | 7 - | 6 | $\lceil \bar{2} \rceil$ | 3 | $\lceil 1 \rceil$ | 8 | 5 | $\frac{1}{4}$ | 9 |
| | 5 | $\bar{3}$ | 8 | $-\frac{1}{9}$ | $\overline{4}^{-}$ | $\overline{5}$ | 7 | $\overline{6}$ | $\overline{2}^{-}$ | 1 |
| | 6 | 9 | 7 | 6 | 1 | 4 | 3 | 2 | 8 | 5 |
| | 7 | 8 - | 3 | - ī ⁻ | 5 | $\bar{6}$ | $\overline{2}^{-}$ | 9 - | 7 | 4 |
| | 8 | 5 | 2 | $\bar{4}^-$ | 7 | $\overline{8}$ | 9 | 1 | 6 | 3 |

| _ | Col | \rightarrow | | | | | | | | |
|-----|-----|----------------|-----|-------------------------|---|------------------------------|-----------------------------|-----------------------------------|--------------------|-------|
| Row | | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 4 | 0 | 1 | 9 | 7 | 6 | 3 | 4 | 8 | 5 | 2 |
| | 1 | $\bar{2}$ | 4 | ī <u>8</u> - | 9 | [7 - | 5 | 3 | 1 | · 6] |
| | 2 | $\overline{6}$ | 5 | $\bar{3}^{-}$ | 8 | $\lceil \bar{2} \rceil$ | 11 | $\overline{4}$ | † - 9 | 7 |
| | 3 | 4 | · 1 | ı <u>5</u> | 2 | ı 9 | - 6 | 7 | · 3 | · 8 |
| | 4 | 7 - | 6 | $\lceil \bar{2} \rceil$ | 3 | $\lceil \overline{1} \rceil$ | 8 | 5 | [4] | [9] |
| | 5 | $\bar{3}$ | 18 | $-\frac{1}{9}$ | 5 | $\bar{4}$ | 7 | $\begin{bmatrix} 6 \end{bmatrix}$ | $\overline{2}^{-}$ | 1 |
| | 6 | 9 | 7 | 6 | 1 | 5 | 3 | 2 | 8 | 4 |
| | 7 | $\bar{8}^{-}$ | 3 | ī ī ⁻ | 4 | $\bar{6}$ | $\frac{1}{1}$ $\frac{1}{2}$ | 9 | 7 - | 5 |
| | 8 | $\overline{5}$ | 12 | $\bar{1}$ $\bar{4}$ | 7 | [8] | 9 | 1 | 6 | 3 |

$Col \rightarrow$ Row 3 1 4 5 6 7 \downarrow 7 2 9 3 5 6 4 8 0 $\frac{5}{9}$ $\frac{1}{7}$ $\frac{5}{7}$ $\frac{3}{3} + \frac{1}{1} + \frac{5}{6}$ $\frac{1}{2} - \frac{1}{4} - \frac{1}{8} = \frac{1}{8}$ 1 7.7 -1-5-+ - $\frac{1}{2}$ ⁺ 9 $\bar{6}$ $\bar{3}$ 2 $\overline{4}$ 8 3 +9+6 5 | 1 1 **4** 2 7 ⊥ 3 ı 8 $\begin{bmatrix} \frac{7}{2} \\ \frac{1}{9} \end{bmatrix}$ -1-6 · - 1 $\frac{5}{6}$ 7 4 7 9 $\bar{7}$ 4 8 3 . L <u>t</u> . I <u>5</u> $\frac{1}{1} = \frac{1}{2} = \frac{1}{1}$ 5 $\bar{3}$ -i-8 $\overline{4}$ $\frac{2}{9} + \frac{8}{7} + \frac{5}{4}$ 6 9 6 1 4 3 $\frac{1}{1}\frac{3}{2}$ - + - ⊢ 7 -|-3 $\bar{1}$ 5 6 $\overline{5}$ $7^{-\frac{1}{8}} = \frac{1}{9}$ 1 6 3 $\overline{4}$ -12^{-1} 8

 $\mathbf{Col} \to$ Row 3 | 4 | 5 0 1 $\mathbf{2}$ 6 7 \downarrow · 9 $-\frac{1}{4} - \frac{1}{8} = 8$ $\bar{2}$ 1 7.1 $\frac{3}{8} - \frac{1}{2}$ 6 -1-5 - + 3 $\frac{3}{4} + \frac{1}{9} - \frac{3}{7}$ 2 3 5 + 1 + 42 | 9 | 6 7 | 3 | 8 $\frac{1}{2}$ -|-6 1 7 8 $\bar{7}$ 5 7 4 - 1 - 9 3 4 -i -8 $\bar{1}4$ $\overline{3}$ $\sqrt{7}$ 6 $\frac{1}{1}$ $\frac{1}{2}$ 5 5 2 9 6 6 5 1 3 $\frac{1}{2}$ $\bar{6}$ $\bar{1}$ 7 $\overline{4}^{-}$ 1 - 6 - 3 4 - 2 5 $\frac{1}{7} - \frac{1}{8} = \frac{1}{9}$ 8

Row

 \downarrow

 $Col \rightarrow$ 0 1 $\mathbf{2}$ 3 | 4 | 5 6 7 9 7 3 6 2 $-\frac{8}{3} + \frac{1}{1} + \frac{5}{1} - \frac{2}{6}$ $\frac{3}{9} - \frac{1}{7} = \frac{7}{5}$ $\frac{1}{2} - \frac{1}{8} - \frac{1}{4}$ $^{\dashv}$ $\bar{1}$ ⁺ 9 $\bar{3}$ -1-5-+ - + $\bar{2}$ $\bar{6}$ $\overline{\mathbf{2}}$ 8 $\overline{4}$ 3 + 3 +9+6 4 + 1 2 $\begin{bmatrix} 2 & 1 & 4 & 1 & 9 \\ 2 & 1 & 3 & 1 & 1 \end{bmatrix}$ 7.8 4 3 4 5 1 $\frac{2}{1}$ 6 6 1 4 3 $-1 - - + \frac{7}{4} - \frac{1}{9}$ $\frac{1}{9}$ $\frac{\overline{8}}{\overline{5}}$ $-\,^{\vdash}_{\vdash}\,\bar{6}$ 7 5 $7^{-\frac{1}{1}}\frac{8}{8}$ $\overline{}$ $\overline{}$

 $Col \rightarrow$ Row $3 \mid 4 \mid$ 7 1 **5** 6 \downarrow 7 2 9 3 5 6 4 8 $\mathbf{0}$ $\frac{1}{9}$ $\frac{1}{7}$ $\frac{1}{7}$ $\frac{1}{5}$ $\bar{2}^{-1} - 8^{-1} \bar{4}$ $\frac{1}{3} + \frac{1}{1} + \frac{1}{6} = \frac{1}{6}$ 1 7.7 -1-5-+ $-\vdash \bar{2}$ ⁺ 9 $\bar{3}$ 2 $\bar{6}$ $\overline{4}$ 8 3 +9+6 4 + 1 3 2 5 + 7 ı 8 1 7 4 - 1 - 9 $\begin{bmatrix} 7 & \overline{5} \\ 1 & \overline{8} \end{bmatrix}$ · - 1 $\bar{7}$ $\bar{2}$ 4 6 8 -3 $\frac{1}{3} \frac{4}{1} \frac{9}{1}$ -<u>-</u>-5 $\bar{9}$ ---2 $\bar{1}4$ 5 - + 1 1 6 6 1 5 3 $\frac{3}{9}$ - ⊢ -₁-3-7 4 6 $\frac{5}{5} - \frac{1}{4} - \frac{1}{9} = \frac{5}{9}$ 7--8 $-\frac{1}{2}$

8

 $\operatorname{Col} \to$ Row 3 | 4 | 5 0 1 $\mathbf{2}$ 6 7 8 \downarrow 9 0 $\bar{2}$ 1 7.1 $\frac{3}{8} - \frac{1}{2}$ 3 -1-5- + 6 $\frac{3}{4} + \frac{1}{9} - \frac{3}{7}$ 2 3 4 + 1 + 53 | 9 | 6 2 | 7 | 8 - F <u>-</u> 5 7 4 9 7 -1-6 $\lceil \bar{3} \rceil$ 7.8 2 4 5 18 -12^{-} $\sqrt{7}$ $\frac{1}{1} \frac{1}{3}$ 5 $\bar{9}$ 4 6 6 1 4 3 $\frac{3}{9}$ 5 L 6 7 $\frac{1}{7} - \frac{1}{8} = \frac{1}{2}$ 8

 $Col \rightarrow$ Row 7 | 8 0 1 $\mathbf{2}$ 3 | 4 | 5 6 \downarrow 3 9 7 2 6 4 $-\frac{8}{3} + \frac{1}{1} + \frac{5}{1} - \frac{2}{6}$ $\frac{3}{9} - \frac{1}{7} = \frac{7}{5}$ $\frac{1}{2} - \frac{1}{8} - \frac{1}{4}$ $^{\dashv}$ $\bar{1}$ -1-5-+ ⁺ 9 $\bar{3}$ $\overline{6}$ $-\vdash \bar{2}$ $\overline{\mathbf{2}}$ 8 $\overline{4}$ 3 1 5 +9+6 2 4 + 1 3 $\begin{bmatrix} 1 \\ 1 \end{bmatrix}$ 7.8 5 7 4 - 1 9 4 $\overline{2}$ _ L 5 $\overline{6}$ $\frac{1}{1}\frac{1}{3}$ 5 1 11 $\frac{2}{1}$ 6 6 1 5 3 9 $\frac{9}{7} + \frac{8}{2} + \frac{4}{5}$ $\frac{1}{9}$ $-1 - - + \frac{7}{4} - \frac{1}{9}$ $\frac{\overline{8}}{\overline{5}}$ $\bar{6}$ 7 $\overline{4}^{-}$ $\frac{1}{1} + \frac{2}{6} + \frac{3}{3}$ $7^{-\frac{1}{1}}\frac{8}{8}$ $\overline{}$ $\overline{}$

| 8 |
|---|
| 2 |
| 6 |
| 7 |
| 8 |
| 9 |
| 1 |
| 5 |
| 4 |
| 3 |
| |

| _ | $\operatorname{Col} 	o$ | | | | | | | | | | | |
|----------|-------------------------|-------------------------|-----|-------------------------|---------|-------------------------|-----|-----------------------------------|--------------------|-----------------------------------|--|--|
| Row | | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | |
| + | 0 | 1 | 9 | 7 | 6 | 3 | 4 | 8 | 5 | 2 | | |
| | 1 | $\bar{2}$ | 18 | $\bar{1} \bar{4}$ | 9 | - 7 - | 5 | 3 | 1 | ·-6 | | |
| | 2 | $\bar{3}$ | 5 | $\frac{+6}{6}$ | 8 | $\lceil \bar{2} \rceil$ | 17 | $\overline{4}$ | † - 9 - | 7 | | |
| | 3 | 4 | · 1 | ı <u>5</u> | 3 | - 9 | □ 6 | 7 | · 2 | ı 8 | | |
| | 4 | 7 - | 6 | $\lceil \bar{3} \rceil$ | 2^{-} | [ī ī | 8 | $\overline{5}$ | [4] | [9] | | |
| | 5 | $\lceil \bar{9} \rceil$ | 12 | $\overline{8}$ | 5 | $\bar{4}$ | 7 | $\begin{bmatrix} 6 \end{bmatrix}$ | $\overline{3}^{-}$ | 1 | | |
| | 6 | 6 | 7 | $\frac{1}{1}$ 2 | 1 | 5 | 1 3 | 9 | 8 | 4 | | |
| | 7 | $\bar{8}^{-}$ | 3 | $\bar{1}$ | 4 | [6] | 9 | 2 | 7 - | $\begin{bmatrix} 5 \end{bmatrix}$ | | |
| | 8 | $\lceil 5 \rceil$ | 4 | $\bar{9}$ | 7 | [8] | 2 | 1 | 6 | [3] | | |

| _ |
|---|
| 8 |
| 2 |
| 6 |
| 7 |
| 8 |
| 9 |
| 1 |
| 5 |
| 4 |
| 3 |
| |

| | Col | \rightarrow | | | | | | | | |
|----------|-----|-------------------------|-----|-------------------------------|---------|---------------------------|-------------------|-----------------------------------|------------------------------------|------------------------------------|
| Row | | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| + | 0 | 1 | 9 | 7 | 6 | 3 | 4 | 8 | 5 | 2 |
| | 1 | $\bar{2}$ | 18 | $\bar{1}$ $\bar{4}$ $\bar{4}$ | 9 | $\bar{1}\bar{7}$ | 5 | $\overline{3}$ | $\bar{1}^{-}$ | 6 |
| | 2 | $\bar{3}$ | 5 | $\frac{+}{6}$ - | 8 | $\lfloor \bar{2} \rfloor$ | 1 1 | $\overline{4}$ | 9 - | 7 |
| | 3 | 5 | · 1 | · 3 | 4 | ı 9 | - 6 | 7 | · 2 | · 8 |
| | 4 | 7 - | 6 | $\lceil \bar{2} \rceil$ | 3 | [ī - | 8 | $\overline{5}$ | $\begin{bmatrix} -4 \end{bmatrix}$ | -9 |
| | 5 | $\lceil \bar{9} \rceil$ | 4 | $\overline{8}$ | 2^{-} | $\overline{5}$ | 7 | $\begin{bmatrix} 6 \end{bmatrix}$ | $\overline{3}^{-}$ | 1 |
| | 6 | 6 | 7 | 9 | 1 | ¦ 4 | 3 | 2 | 8 | 5 |
| | 7 | $\bar{8}^{-}$ | 3 | ī ī ⁻ | 5 | $\bar{6}$ | $\frac{1}{2}^{-}$ | 9 | 7 | $\begin{bmatrix} -4 \end{bmatrix}$ |
| | 8 | 4^{-} | 12 | $\lceil \bar{5} \rceil$ | 7 | [8] | 9 | 1 | 6 | 3 |

3 Algorithm ended

All the sudokus showed above are solutions of the sudoku:

| | Col | \rightarrow | | | | | | | | |
|-----|-----|---------------|------------|------------|---|--------|----------|----------------|-------------------------|-----------|
| Row | | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 4 | 0 | | İ | 7 | | | _ | | i | 2 |
| | 1 | $\bar{2}$ | i | i — — | | | 5 | | $\bar{1}$ |] |
| | 2 | | r — — I | 1 — — I | 8 | — — | 1^{-1} | $\overline{4}$ | г — . I | _] |
| | 3 | | 1 | I | ı | 9 | - 6 | | ı | 8 |
| | 4 | 7 | 6 | 1 — — 1 | | | | | $\lceil \bar{4} \rceil$ | $\bar{9}$ |
| | 5 | | . – – | , | | | i – | | · |] |
| | 6 | | l ı | | 1 | l I | 3 | | l ı | l ı |
| | 7 | 8 | . – – | 1^{-} | | 6 | i – – | | I | |
| | 8 | | | i – – | 7 | | | | $\bar{6}$ | $\bar{3}$ |

If you want to see or use the code that abled this file to exist or you would like to see more code like this, check the authors GitHub: Jkutkut's GitHub