

$$\begin{aligned} 1. \quad 2x - 4y + z &= -1 \\ 4x - 8y + 2z &= 5 \\ 3x - y - 4z &= -5 \end{aligned}$$

$$\begin{bmatrix} 2 & -4 & 1 & -1 \\ 4 & -8 & 2 & 5 \\ 3 & -1 & -4 & -5 \end{bmatrix} \xrightarrow{R_1 \div 2 = \text{NEW } R_1} \begin{bmatrix} 1 & -2 & \frac{1}{2} & -\frac{1}{2} \\ 4 & -8 & 2 & 5 \\ 3 & -1 & -4 & -5 \end{bmatrix}$$

$$-\frac{3}{2} - 4$$

$$-\frac{3}{2} - 4$$

$$-\frac{3}{2} - 5$$

$$\begin{aligned} -4R_1 + R_2 &= \text{NEW } R_2 \\ -3R_1 + R_3 &= \text{NEW } R_3 \end{aligned} \begin{bmatrix} 1 & -2 & \frac{1}{2} & -\frac{1}{2} \\ 0 & 0 & 0 & 7 \\ 0 & 5 & -\frac{7}{2} & -\frac{7}{2} \end{bmatrix}$$

$$\text{SWAP } R_2 \text{ AND } R_3 \begin{bmatrix} 1 & -2 & \frac{1}{2} & -\frac{1}{2} \\ 0 & 5 & -\frac{7}{2} & -\frac{7}{2} \\ 0 & 0 & 0 & 7 \end{bmatrix}$$

$$-\frac{11}{2} \div 5 = -\frac{11}{2} \cdot \frac{1}{5} = -\frac{11}{10}$$

$$R_2 \div 5 = \text{NEW } R_2 \begin{bmatrix} 1 & -2 & \frac{1}{2} & -\frac{1}{2} \\ 0 & 1 & -\frac{7}{10} & -\frac{7}{10} \\ 0 & 0 & 0 & 7 \end{bmatrix}$$

$$R_3 \div 7 = \text{NEW } R_3 \begin{bmatrix} 1 & -2 & \frac{1}{2} & -\frac{1}{2} \\ 0 & 1 & -\frac{7}{10} & -\frac{7}{10} \\ 0 & 0 & 0 & -1 \end{bmatrix}$$

$$\begin{aligned} -\frac{11}{5} + \frac{1}{2} &= \frac{-22}{10} + \frac{5}{10} = -\frac{17}{10} \\ -\frac{7}{5} - \frac{1}{2} &= \frac{-14}{10} - \frac{5}{10} = -\frac{19}{10} \end{aligned}$$

$$2R_2 + R_1 = \text{NEW } R_1 \begin{bmatrix} 1 & 0 & -\frac{13}{10} & -\frac{19}{10} \\ 0 & 1 & -\frac{7}{10} & -\frac{7}{10} \\ 0 & 0 & 0 & -1 \end{bmatrix}$$

LAST ROW  $[0 \ 0 \ 0 \ \dots \ 0 \ 1]$

NO SOLUTION

$$\begin{bmatrix} 2 & -4 & 1 & -1 \\ 4 & -8 & 2 & 5 \\ 3 & -1 & -4 & -5 \end{bmatrix}$$