

31)

$$\left. \begin{aligned} x+y-2z &= 14 \\ 2x-y+z &= 0 \\ 6x+3y+4z &= 1 \end{aligned} \right\} \Rightarrow \begin{aligned} R_2 - 2R_1 &\Rightarrow \\ R_3 - 6R_1 & \end{aligned}$$

$$\left. \begin{aligned} x+y-2z &= 14 \\ -3y+5z &= -28 \\ -3y+16z &= -83 \end{aligned} \right\} R_3 - R_2$$

$$\Rightarrow \begin{aligned} x+y-2z &= 14 \\ -3y+5z &= -28 \\ 11z &= -55 \end{aligned} \Rightarrow z = -5$$

$$\begin{aligned} x + (-5) &= 14 \Rightarrow x = 19 \\ -3y + (5(-5)) &= -28 \Rightarrow -3y - 25 = -28 \Rightarrow -3y = -3 \Rightarrow y = 1 \end{aligned}$$

$$\boxed{(x, y, z) = (19, 1, -5)}$$

35)

$$\left. \begin{aligned} 2x+y+z &= 4 \\ 10x-2y+2z &= -1 \\ 6x-2y+4z &= 8 \end{aligned} \right\} \begin{aligned} R_2 - 5R_1 &\Rightarrow \\ R_3 - 3R_1 & \end{aligned}$$

$$\left. \begin{aligned} 2x+y+z &= 4 \\ -7y-3z &= -21 \\ -5y+z &= -4 \end{aligned} \right\} 3R_3 + R_2$$

$$\begin{aligned} 2x+y+z &= 4 \\ -7y-3z &= -21 \\ -22y &= -33 \Rightarrow \boxed{y = 3/2} \end{aligned}$$

$$\Rightarrow -7(3/2) - 3z = -21 \Rightarrow -3z = -21 + 21/2 = -21/2$$

$$\Rightarrow \boxed{z = 7/2}$$

$$\Rightarrow 2x + 3/2 + 7/2 = 4 \Rightarrow 2x = 4 - 5 \Rightarrow \boxed{x = -1/2}$$

39)

$$\left. \begin{aligned} x + 2y + 4z &= 2 \\ 2x + 4y + 3z &= 1 \\ x + 2y - z &= 7 \end{aligned} \right\}$$

$$\begin{aligned} R_2 - 2R_1 &\Rightarrow \\ R_3 - R_1 & \end{aligned}$$

$$\left. \begin{aligned} x + 2y + 4z &= 2 \\ -5z &= -3 \\ -5z &= 5 \end{aligned} \right\}$$

$$R_3 - R_2$$

$$\Rightarrow \begin{array}{l} \circ = 8 \\ \nearrow \end{array}$$

This is not possible.
we call this 'inconsistent')

Therefore There is no
Solution.