

Three equations in three unknowns!

$$\begin{aligned} \textcircled{1} \quad & x - 3y - 2z = 6 \quad \leftarrow \\ \textcircled{2} \quad & 2x - 4y - 3z = 8 \quad \leftarrow \\ \textcircled{3} \quad & -3x + 6y + 8z = -5 \quad \leftarrow \end{aligned}$$

$$\begin{aligned} \textcircled{1} \times 2: & 2x - 6y - 4z = 12 \\ \textcircled{2} \quad & \underline{2x - 4y - 3z = 8} \\ \textcircled{2}' \quad & 0 - 2y - \underline{-z} = 4 \quad \times \end{aligned}$$

$$\begin{aligned} \textcircled{1} \times 3: & 3x - 9y - 6z = 18 \\ \textcircled{3} \quad & \underline{+ (-3x + 6y + 8z = -5)} \\ \textcircled{3}' \quad & 0 - 3y + \underline{2z} = 13 \quad \times \end{aligned}$$

$$\begin{aligned} \textcircled{2}' \times 2 \quad & -4y - 2z = 8 \\ \textcircled{3}' \quad & \underline{+ (-3y + 2z = 13)} \\ & -7y + 0 = 21 \\ & \underline{-7y = 21} \\ & \underline{-7} \quad \underline{-7} \end{aligned}$$

$$y = -3$$

$$\begin{aligned} \textcircled{2}' \quad & -2(-3) - z = 4 \\ & 6 - z = 4 \\ & -z = 4 - 6 \\ & -z = -2 \\ & z = 2 \end{aligned}$$

$$\begin{aligned} & x - 3(-3) - 2(2) = 6 \\ & x + 9 - 4 = 6 \\ & x + 5 = 6 \\ & x = 6 - 5 \\ & x = 1 \end{aligned}$$

Solution:

$$x = 1$$

$$y = -3$$

$$z = 2$$