

I. No solutions:

$$\begin{cases} 3x + 2y + 7z = 6 \\ x + y - z = 1 \\ 4x + 3y + 6z = 8 \end{cases}$$

II. One solution :

$$\begin{cases} 3x + 2y + 7z = 6 \\ x + y - z = 1 \\ 4x + 3y + \underline{7}z = 8 \end{cases}$$

$$(x = -5, y = 7, z = 1)$$

III. Infinitely many solutions:

$$\begin{cases} 3x + 2y + 7z = 6 \\ x + y - z = 1 \\ 4x + 3y + 6z = \underline{7} \end{cases}$$