$X_1 = 1$; $X_2 = 2$; $X_3 = 3$

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$2x_1 + 3x_2 - 4x_3$ (1) $2X_1 + 3X_2 - 4X_3 = 2(1) + 3(2) - 4(3) = -4$

$:x_1 + :x_2 + :x_3$ $1X_1 + 1X_2 + 4X_3 = 1(1) + 1(2) + 4(3) = 15$

$:x_1 + :x_2 + :x_3$ $1X_1 + 3X_2 + 2X_3 = 1(1) + 3(2) + 2(3) = 13$

(2)

$$\begin{bmatrix} 2 & 3 & -4 \\ 1 & 1 & 4 \\ 1 & 3 & 2 \end{bmatrix} \begin{bmatrix} X_1 \\ X_2 \\ X_3 \end{bmatrix} = \begin{bmatrix} -4 \\ 15 \\ 13 \end{bmatrix}$$

Recheck

$2X_1 + 3X_2 - 4X_3 = -4$

$2(1) + 3(2) - 4(3) = -4$

$2 + 6 - 12 = -4$

$\therefore -4 = -4$ #

$$\left[\begin{array}{ccc|c} 2 & 3 & -4 & -4 \\ 1 & 1 & 4 & 15 \\ 1 & 3 & 2 & 13 \end{array}\right] \quad R_2 - R_1\left(\tfrac{1}{2}\right), \; R_3 - R_1\left(\tfrac{1}{2}\right) \longrightarrow \left[\begin{array}{ccc|c} 2 & 3 & -4 & -4 \\ 0 & -\tfrac{1}{2} & 6 & 17 \\ 0 & \tfrac{3}{2} & 4 & 15 \end{array}\right]$$

$$\left[\begin{array}{ccc|c} 2 & 3 & -4 & -4 \\ 0 & -\tfrac{1}{2} & 6 & 17 \\ 0 & \tfrac{3}{2} & 4 & 15 \end{array}\right] \quad R_3 - R_2\left(\frac{\frac{3}{2}}{-\frac{1}{2}}\right) \longrightarrow \left[\begin{array}{ccc|c} 2 & 3 & -4 & -4 \\ 0 & -\tfrac{1}{2} & 6 & 17 \\ 0 & 0 & 22 & 66 \end{array}\right]$$

$$\left[\begin{array}{ccc|c} 2 & 3 & -4 & -4 \\ 0 & -\tfrac{1}{2} & 6 & 17 \\ 0 & 0 & 22 & 66 \end{array}\right] \quad -2R_2 \longrightarrow \left[\begin{array}{ccc|c} 2 & 3 & -4 & -4 \\ 0 & -1 & 12 & 34 \\ 0 & 0 & 22 & 66 \end{array}\right]$$

(3)

$2X_1 + 3X_2 - 4X_3 = -4$

$-1X_2 + 12X_3 = 34$

$22X_3 = 66$

X_3 ; $X_3 = \frac{66}{22} = 3$ #

X_2 ; $-1X_2 + 12(3) = 34$

$-1X_2 + 36 = 34$

$-1X_2 = 34 - 36$

$X_2 = \frac{-2}{-1} = 2$ #

X_1 ; $2X_1 + 3(2) - 4(3) = -4$

$2X_1 + 6 - 12 = -4$

$2X_1 = -4 - 6 + 12$

$2X_1 = 2$

$X_1 = \frac{2}{2} = 1$ #