$$3 \cdot (-4) + 2(5) + 6 \cdot (3) = 16$$

$$8 \cdot (-4) + (5) - 2(3) = -33$$

$$5 \cdot (-4) + 5(5) + 3(3) = 14$$

$$3x + 2y + 6z = 16$$

$$8x + y - 2z = -33$$

$$5x + 5y + 3z = 14$$

$$\begin{pmatrix} 16 \\ -33 \\ 14 \end{pmatrix} = x \begin{pmatrix} 3 \\ 8 \\ 5 \end{pmatrix} + y \begin{pmatrix} 2 \\ 1 \\ 5 \end{pmatrix} + z \begin{pmatrix} 6 \\ -2 \\ 3 \end{pmatrix}$$

$\vec{v}$, $\vec{a}$, $\vec{b}$, $\vec{c}$

$$\vec{v} = x \cdot \vec{a} + y \cdot \vec{b} + z \cdot \vec{c}$$

$$\begin{aligned} 3x + 2y + 6z &= 16 \\ 8x + y - 2z &= -33 \\ 5x + 5y + 3z &= 14 \end{aligned} \quad \Big| \cdot(-3)$$

$8L_1$: $24x + 16y + 48z = 128$

$L_2 \leftarrow L_2 + 8L_1$

$$\begin{aligned} 3x + 2y + 6z &= 16 \\ -24x - 3y + 6z &= 99 \\ 5x + 5y + 3z &= 14 \end{aligned}$$

$$\begin{aligned} 3x + 2y + 6z &= 16 \\ 13y + 54z &= 227 \\ 5x + 5y + 3z &= 14 \end{aligned} \quad \Big| \cdot(-3)$$

$$\begin{aligned} 3x + 2y + 6z &= 16 \\ 13y + 54z &= 227 \\ -15x - 15y - 9z &= -42 \end{aligned}$$

$L_3 \leftarrow L_3 + 5L_1$

$5L_1$: $15x + 10y + 30z = 80$

$3x + 2y + 6z = 16$

$13y + 54z = 227$ | $\cdot 5$

$-5y + 21z = 38$ | $\cdot 13$

543

$13y = 227 - 162$

$= 65$

$y = 5$

$5 \cdot 227 \quad 13 \cdot 38$

$270z + 273z = 1135 + 494$

$543z = 1629$

$z = 3$

$3x + 2y + 6z = 16$ $\qquad$ $y = 5 \;/\; z = 3$

$3x = 16 - 10 - 18$

$= -12$

$x = -4$

$S = \{(-4; 5; 3)\}$

$$\begin{pmatrix} 3 & 2 & 6 & 16 \\ 8 & 1 & -2 & -33 \\ 5 & 5 & 3 & 14 \end{pmatrix}$$

$L_2 \leftarrow -3L_2 + 8L_1$

$$\begin{pmatrix} 3 & 2 & 6 & 16 \\ 0 & 13 & 54 & 227 \\ 0 & -5 & 21 & 38 \end{pmatrix}$$

$L_3 \leftarrow -3L_3 + 5L_1$

$$\begin{pmatrix} 3 & 2 & 6 & 16 \\ 0 & 13 & 54 & 227 \\ 0 & 0 & 543 & 1629 \end{pmatrix}$$

$L_3 \leftarrow 13L_3 + 5L_2$