

Sustitución

$$\begin{aligned}5x + 2y + 4z &= 12 \\ -3x + 3y + 3z &= 56 \\ 2x - y - z &= 69\end{aligned}$$

Resolver Ecuación para y

$$\begin{aligned}5x + 2y + 4z &= 12 \\ -3x + 3y + 3z &= 56 \\ y &= 69 + 2x - z\end{aligned}$$

Sustituir el valor de y

$$\begin{aligned}5x + 2(-69 + 2x - z) + 4z &= 12 \\ -3x + 3(-69 + 2x - z) + 3z &= 56\end{aligned}$$

Simplificar

$$\begin{aligned}9x + 2z &= 150 \\ x &= \frac{263}{3}\end{aligned}$$

Sustituir x y resolver Ecuación

$$\begin{aligned}9\left(\frac{263}{3}\right) + 2z &= 150 \\ z &= -\frac{639}{2}\end{aligned}$$

Sustituir z y x y Resolver

$$\begin{aligned}y &= 69 + 2\left(\frac{263}{3}\right) - \left(-\frac{639}{2}\right) \\ y &= \frac{2555}{6}\end{aligned}$$

Resultado

$$x = \frac{263}{3} \quad y = \frac{2555}{6} \quad z = \frac{639}{2}$$

Eliminación

$$\begin{aligned}5x - 2y - 3z &= 22 \\x + 2y - 9z &= 22 \\-4x + 3y + 8z &= 45\end{aligned}$$

Multiplicar $x + 2y + 9z = 22$ por 5

$$\begin{aligned}5x - 2y - 3z &= 22 \\6x + 10y + 45z &= 110 \\-4x + 3y + 8z &= 45\end{aligned}$$

Multiplicar $5x - 2y - 3z = 22$ por 4
 $-4x + 3y + 8z = 45$ por 5

$$\begin{aligned}20x - 8y - 12z &= 88 & -20x + 15y + 40z &= 225 \\12y + 48z &= 88 & + & \\-20x + 15y + 40z &= 225 & 2x - 8y - 12z &= 88 \\ & & \hline & & 7y + 28z &= 313\end{aligned}$$

Multiplicar $12y + 48z = 88$ por 7
 $7y + 28z = 313$ por 12

$$\begin{aligned}20x - 8y - 12z &= 88 & 84y + 336z &= 3756 \\84y + 336z &= 616 & - & \\84y + 336z &= 3756 & 84y + 336z &= 616 \\ & & \hline & & 0 &= 3140\end{aligned}$$

$$\begin{aligned}20x - 8y - 12z &= 88 \\84y + 336z &= 616 \\0 &= 3140\end{aligned}$$

Eliminación de Gauss

$$\begin{aligned}12x - 14y - 45z &= 120 \\645x + 120y + 32z &= -600 \\-3x - 2y + z &= 60\end{aligned}$$

Escribir una Matriz con los coeficientes y solución

$$\begin{array}{ccc|c}12 & -14 & -45 & 120 \\645 & 120 & 3 & -600 \\-3 & -2 & 1 & 60\end{array}$$

Reducir Matriz a su forma Escalonada Reducida
Por renglones

$$\begin{array}{ccc|c}1 & 0 & 0 & \frac{45700}{6967} \\0 & 1 & 0 & \frac{-282510}{6967} \\0 & 0 & 1 & \frac{81500}{6967}\end{array}$$

Resultado.

$$x = \frac{4570}{6967}$$

$$y = \frac{-282510}{6967}$$

$$z = \frac{81500}{6967}$$