

Coloca el nombre del sistema que corresponde a cada imagen:

$$\begin{cases} 4x + 2y + 3z = 28 \\ x + y - 2z = 4 \\ 3x + y + 4z = 22 \end{cases}$$

Sol.

Primero colocarlo en una matriz, luego se puede intercambiar una fila por otra y se procede a sumar o restar filas, quedando ceros debajo de la diagonal de la matriz $M_{3 \times 3}$.

$$\begin{bmatrix} 4 & 2 & 3 & | & 28 \\ 1 & 1 & -2 & | & 4 \\ 3 & 1 & 4 & | & 22 \end{bmatrix} \xrightarrow{\text{Se intercambia la fila}} \begin{bmatrix} 1 & 1 & -2 & | & 4 \\ 4 & 2 & 3 & | & 28 \\ 3 & 1 & 4 & | & 22 \end{bmatrix}$$

$$f_2 - 4f_1 \rightarrow \begin{bmatrix} 1 & 1 & -2 & | & 4 \\ 0 & -2 & 11 & | & 12 \\ 3 & -3 & 10 & | & 10 \end{bmatrix} \xrightarrow{f_2 - 4f_1} \begin{bmatrix} 1 & 1 & -2 & | & 4 \\ 0 & -2 & 11 & | & 12 \\ 0 & -2 & 10 & | & 10 \end{bmatrix}$$

$$f_1 - f_2 \rightarrow \begin{bmatrix} 1 & 1 & -2 & | & 4 \\ 0 & -2 & 11 & | & 12 \\ 0 & 0 & -1 & | & -2 \end{bmatrix} \rightarrow \begin{cases} x + y - 2z = 4 \\ -2y + 11z = 12 \\ -z = -2 \end{cases}$$

Ahora solo queda a despejar los valores de abajo hacia arriba
 $z=2$; $-2y+11(2)=12 \Rightarrow y=5$; $x+5-2(2)=4 \Rightarrow x=3$

$$C_{12} = (+) \begin{bmatrix} 2 & 1 & 0 \\ 1 & 1 & 1 \\ 0 & -1 & 2 \end{bmatrix} \quad C_{12} = (-) \begin{bmatrix} 2 & 1 & 0 \\ 1 & 1 & 1 \\ 0 & -1 & 2 \end{bmatrix} \quad C_{13} = (+) \begin{bmatrix} 2 & 1 & 0 \\ 1 & 1 & 1 \\ 0 & -1 & 2 \end{bmatrix}$$

$$C_{21} = (+) \begin{bmatrix} 1 & 1 & 1 \\ 2 & 1 & 0 \\ 0 & -1 & 2 \end{bmatrix} \quad C_{22} = (-) \begin{bmatrix} 1 & 1 & 1 \\ 2 & 1 & 0 \\ 0 & -1 & 2 \end{bmatrix} \quad C_{23} = (+) \begin{bmatrix} 1 & 1 & 1 \\ 2 & 1 & 0 \\ 0 & -1 & 2 \end{bmatrix}$$

$$C_{31} = (-) \begin{bmatrix} 1 & 1 & 1 \\ 2 & 1 & 0 \\ 0 & -1 & 2 \end{bmatrix} \quad C_{32} = (+) \begin{bmatrix} 1 & 1 & 1 \\ 2 & 1 & 0 \\ 0 & -1 & 2 \end{bmatrix} \quad C_{33} = (-) \begin{bmatrix} 1 & 1 & 1 \\ 2 & 1 & 0 \\ 0 & -1 & 2 \end{bmatrix}$$

$$C_{11} = (+) \begin{bmatrix} 1 & 1 & 1 \\ 2 & 1 & 0 \\ 0 & -1 & 2 \end{bmatrix} \quad C_{12} = (-) \begin{bmatrix} 1 & 1 & 1 \\ 2 & 1 & 0 \\ 0 & -1 & 2 \end{bmatrix} \quad C_{13} = (+) \begin{bmatrix} 1 & 1 & 1 \\ 2 & 1 & 0 \\ 0 & -1 & 2 \end{bmatrix}$$

$$C_{21} = (+) \begin{bmatrix} 1 & 1 & 1 \\ 2 & 1 & 0 \\ 0 & -1 & 2 \end{bmatrix} \quad C_{22} = (-) \begin{bmatrix} 1 & 1 & 1 \\ 2 & 1 & 0 \\ 0 & -1 & 2 \end{bmatrix} \quad C_{23} = (+) \begin{bmatrix} 1 & 1 & 1 \\ 2 & 1 & 0 \\ 0 & -1 & 2 \end{bmatrix}$$

$$C_{31} = (-) \begin{bmatrix} 1 & 1 & 1 \\ 2 & 1 & 0 \\ 0 & -1 & 2 \end{bmatrix} \quad C_{32} = (+) \begin{bmatrix} 1 & 1 & 1 \\ 2 & 1 & 0 \\ 0 & -1 & 2 \end{bmatrix} \quad C_{33} = (-) \begin{bmatrix} 1 & 1 & 1 \\ 2 & 1 & 0 \\ 0 & -1 & 2 \end{bmatrix}$$



$$\begin{vmatrix} a_{11} & a_{12} & a_{13} \\ a_{21} & a_{22} & a_{23} \\ a_{31} & a_{32} & a_{33} \end{vmatrix} + \begin{vmatrix} a_{11} & a_{12} & a_{13} \\ a_{21} & a_{22} & a_{23} \\ a_{31} & a_{32} & a_{33} \end{vmatrix} - \begin{vmatrix} a_{11} & a_{12} & a_{13} \\ a_{21} & a_{22} & a_{23} \\ a_{31} & a_{32} & a_{33} \end{vmatrix}$$

$$\det \begin{pmatrix} a_{11} & a_{12} & a_{13} \\ a_{21} & a_{22} & a_{23} \\ a_{31} & a_{32} & a_{33} \end{pmatrix} = \begin{vmatrix} a_{11} & a_{12} & a_{13} \\ a_{21} & a_{22} & a_{23} \\ a_{31} & a_{32} & a_{33} \end{vmatrix} =$$

$$= (a_{11} \cdot a_{22} \cdot a_{33} + a_{12} \cdot a_{23} \cdot a_{31} + a_{13} \cdot a_{21} \cdot a_{32}) -$$

$$- (a_{13} \cdot a_{22} \cdot a_{31} + a_{12} \cdot a_{21} \cdot a_{33} + a_{23} \cdot a_{32} \cdot a_{11})$$

