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_{3x3}

$$\left[\begin{array}{ccc|c} 4 & 2 & 3 & 28 \\ 1 & 1 & -2 & 4 \\ 3 & 1 & 4 & 22 \end{array}\right] \quad \left[\begin{array}{ccc|c} 1 & 1 & -2 & 4 \\ 4 & 2 & 3 & 28 \\ 3 & 1 & 4 & 22 \end{array}\right]$$ Se intercambio la fila

$$\xrightarrow{f_3-3f_1} \left[\begin{array}{ccc|c} 1 & 1 & -2 & 4 \\ 4 & 2 & 3 & 28 \\ (3-3(1)) & (1-3(1)) & (4-3(-2)) & (22-3(4)) \end{array}\right]$$

$$\left[\begin{array}{ccc|c} 1 & 1 & -2 & 4 \\ 4 & 2 & 3 & 28 \\ 0 & -2 & -10 & 10 \end{array}\right] \xrightarrow{f_2-4f_1} \left[\begin{array}{ccc|c} 1 & 1 & -2 & 4 \\ 0 & -2 & 11 & 12 \\ 0 & -2 & 10 & 10 \end{array}\right]$$

$$\xrightarrow{f_1-f_2} \left[\begin{array}{ccc|c} 1 & 1 & -2 & 4 \\ 0 & -2 & 11 & 12 \\ 0 & 0 & -1 & -2 \end{array}\right] \qquad \begin{cases} x + y - 2z = 4 \\ -2y + 11z = 12 \\ -z = -2 \end{cases}$$

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

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

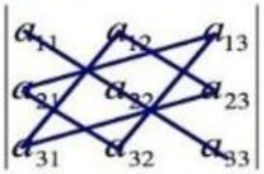
$$C_{11}=(+)\begin{vmatrix} 1 & 1 \\ -1 & 2 \end{vmatrix}=(+)[2-(-1)]=3 \qquad C_{12}=(-)\begin{vmatrix} 1 & 1 \\ 0 & 2 \end{vmatrix}=(-)[2-0]=-2 \qquad C_{13}=(+)\begin{vmatrix} 1 & 1 \\ 0 & -1 \end{vmatrix}=(+)[-1-0]=-1$$

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

$$C_{21}=(-)\begin{vmatrix} 1 & 0 \\ 1 & 2 \end{vmatrix}=(-)[2-0]=-2 \qquad C_{22}=(+)\begin{vmatrix} 2 & 0 \\ 0 & 2 \end{vmatrix}=(+)[4-0]=4 \qquad C_{23}=(-)\begin{vmatrix} 2 & 1 \\ 0 & -1 \end{vmatrix}=(-)[-2-0]=2$$

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

$$C_{31}=(+)\begin{vmatrix} 1 & 0 \\ 1 & 1 \end{vmatrix}=(+)[1-0]=1 \qquad C_{32}=(-)\begin{vmatrix} 2 & -1 \\ 0 & 1 \end{vmatrix}=(-)[2-0]=-2 \qquad C_{33}=(+)\begin{vmatrix} 2 & -1 \\ 0 & 1 \end{vmatrix}=(+)[2-1]=1$$



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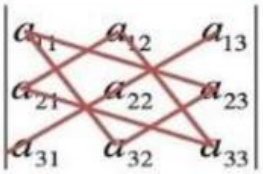

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$$\det\begin{pmatrix} a_{1,1} & a_{1,2} & a_{1,3} \\ a_{2,1} & a_{2,2} & a_{2,3} \\ a_{3,1} & a_{3,2} & a_{3,3} \end{pmatrix} = \begin{vmatrix} a_{1,1} & a_{1,2} & a_{1,3} \\ a_{2,1} & a_{2,2} & a_{2,3} \\ a_{3,1} & a_{3,2} & a_{3,3} \end{vmatrix} =$$

$$= (a_{1,1} \cdot a_{2,2} \cdot a_{3,3} + a_{1,2} \cdot a_{2,3} \cdot a_{3,1} + a_{2,1} \cdot a_{3,2} \cdot a_{1,3}) -$$

$$-(a_{1,3} \cdot a_{2,2} \cdot a_{3,1} + a_{1,2} \cdot a_{2,1} \cdot a_{3,3} + a_{2,3} \cdot a_{3,2} \cdot a_{1,1})$$

LIVEWORKSHEETS