

EJERCICIO M2BE3469: ¡RESOLVER!

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$$\left. \begin{aligned} mx + 7y + 5z &= 0 \\ x + my + z &= 3 \\ y + z &= -2 \end{aligned} \right\}$$

I) Si $m \neq 2$ y $m \neq -1$; Sistema Compatible Determinado
II) Si $m = 2$; Sistema Compatible Indeterminado

I) Si $m \neq 2$ y $m \neq -1 \Rightarrow$ S.C.D.

MÉTODO DE CRAMER:

$$x = \frac{|A_x|}{|A|} = \frac{\begin{vmatrix} 0 & 7 & 5 \\ 3 & m & 1 \\ -2 & 1 & 1 \end{vmatrix}}{m^2 - m - 2} = \frac{0 - 14 + 15 + 10m - 21}{(m-2)(m+1)} =$$

$$= \frac{10m - 20}{(m-2)(m+1)} = \frac{10(\cancel{m-2})}{(\cancel{m-2})(m+1)} = \frac{10}{m+1} = x$$

$$y = \frac{|A_y|}{|A|} = \frac{\begin{vmatrix} m & 0 & 5 \\ 1 & 3 & 1 \\ 0 & -2 & 1 \end{vmatrix}}{(m-2)(m+1)} = \frac{3m - 10 + 2m}{(m-2)(m+1)} =$$

$$= \frac{5m - 10}{(m-2)(m+1)} = \frac{5(\cancel{m-2})}{(\cancel{m-2})(m+1)} = \frac{5}{m+1} = y$$

$$z = \frac{|A_z|}{|A|} = \frac{\begin{vmatrix} m & 7 & 0 \\ 1 & m & 3 \\ 0 & 1 & -2 \end{vmatrix}}{(m-2)(m+1)} = \frac{-2m^2 - 3m + 14}{(m-2)(m+1)} =$$

↗ $x=2; x=-\frac{7}{2}$

$$= \frac{-2(\cancel{m-2})(m-\frac{7}{2})}{(\cancel{m-2})(m+1)} = \frac{-2m + 14}{m+1} = z$$

Continua...

II) Si $w=2 \Rightarrow$ S.C.S.

$$\begin{cases} 2x + 7y + 5z = 0 \\ x + 2y + z = 3 \\ \cancel{y + z = -2} \end{cases} \rightarrow \text{Prescindimos de ésta} \\ \text{(de hecho es } \frac{1^a - 2 \cdot 2^a}{3} \text{)}$$

$(z=1)$

$$\begin{cases} 2x + 7y = -5 \\ x + 2y = 3 - 1 \end{cases} \rightarrow \begin{cases} 2x + 7y = -5 \\ (-2) \cdot x - 4y = -6 + 2 \end{cases}$$

$$3y = -6 - 3$$
$$y = \frac{-6 - 3}{3}$$

$y = -2 - 1$

$\downarrow$

$\overset{2}{}$

$$x + 2 \cdot (-2 - 1) = 3 - 1$$

$$x - 4 - 2 = 3 - 1$$

$$x = 3 - 1 + 4 + 2 \Rightarrow \boxed{x = 7 + 1}$$

$z = 1$

¡Infinitas soluciones!