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Tarefa Básica - Discussão de Sistemas Lineares

01.
$$\begin{cases} ax + 4y = 1 \\ x + 2y = b \end{cases} \quad D = \begin{vmatrix} a & 4 \\ 1 & 2 \end{vmatrix} = 2a - 4 \rightarrow \text{Letra B,}$$

$$\frac{D_x}{0} \neq \frac{D_y}{0}$$

02.
$$\begin{cases} x + ky = 1 \\ Kx + y = 1 - K \end{cases} \quad D = \begin{vmatrix} 1 & K \\ K & 1 \end{vmatrix} = 1 - K^2 \quad 1 - K^2 \neq 0$$

$$-K^2 \neq -1 \cdot (-1) \quad K \neq \pm 1$$

 Letra D

03.
$$\begin{cases} x + 2y + 0z = 1 \\ y + z = 2 \\ 3x + 2y + 2z = -1 \end{cases}$$

a)
$$A = \begin{pmatrix} 1 & 2 & 0 \\ 0 & 1 & 1 \\ 3 & 2 & 2 \end{pmatrix} \quad D = \begin{vmatrix} 1 & 2 & 0 & 1 & 2 \\ 0 & 1 & 1 & 0 & 1 \\ 3 & 2 & 2 & 3 & 2 \end{vmatrix} = 8 - (3c + 2) = -3c + 6$$

$$3c + 2 + 0$$

$$2 + 6 + 0$$

b) $6 - 3c \neq 0$
 $-3c \neq -6 \cdot (-1)$
 $c \neq 2$

04.
$$\begin{cases} x - y = K \\ 12x - Ky + z = 1 \\ 36x + Kz = 2 \end{cases} \quad D = \begin{vmatrix} 1 & -1 & 0 & 1 & -1 \\ 12 & -K & 1 & 12 & -K \\ 36 & 0 & K & 36 & 0 \end{vmatrix} = -K^2 + 12K - 36$$

$$-K^2 - 36$$

$-K^2 + 12K - 36 \neq 0$

$$K = \frac{-12 \pm 0}{2(-1)} = \frac{-12}{-2} = 6 \quad K \neq 6 \text{ Letra E}$$

$\Delta = 12^2 - 4 \cdot (-1) \cdot (-36)$

$\Delta = 144 - 144$

$\Delta = 0$

05.

$$\begin{cases} x - y + z = 6 \\ 2x + y - z = -3 \\ x + 2y - z = -5 \end{cases}$$

D =

$$\begin{vmatrix} 1 & -1 & 1 \\ 2 & 1 & -1 \\ 1 & 2 & -1 \end{vmatrix} = 1(-1-1) = -2$$

w.s.p.O

Dx =

$$\begin{vmatrix} 6 & -1 & 1 \\ -3 & 1 & -1 \\ -5 & 2 & -1 \end{vmatrix} = 6(-1-1) = -12$$

$$= -12 - (-20) = 8$$

$$x = \frac{8}{-2} = -4$$

3

Dy =

$$\begin{vmatrix} 1 & 6 & 1 \\ 2 & -3 & -1 \\ 1 & -5 & -1 \end{vmatrix} = 1(-3-1) = -4$$

$$= -4 - (-10) = -6$$

$$y = \frac{-6}{-2} = 3$$

3

Dz =

$$\begin{vmatrix} 1 & -1 & 6 \\ 2 & 1 & -3 \\ 1 & 2 & -5 \end{vmatrix} = 1(-5-1) = -6$$

$$= -6 - 10 = -16$$

$$z = \frac{-16}{-2} = 8$$

3

$$x \cdot y \cdot z = 1 \cdot (-1) \cdot 4 = -4 \sim \text{Letra B}$$

06.

$$\begin{cases} x + y + z = K \\ Kx + y + z = 1 \\ x + y - z = K \end{cases}$$

D =

$$\begin{vmatrix} 1 & 1 & 1 \\ K & 1 & 1 \\ 1 & 1 & -1 \end{vmatrix} = 1(-1-1) = -2$$

$$2K - 2 \neq 0$$

$$K \neq 1$$

Letra D

$$K \neq -1$$

$$D = \begin{vmatrix} m & -2 & 4 & m & -2 \\ m^2 & 4 & 16 & m^2 & 4 \end{vmatrix} = -32 + 4m^2 + 4m$$

$$D = 4m^2 + 4m - 32 - (-2m^2 + 16m + 16)$$

$$D = 6m^2 - 12m - 48$$

$$\Delta = 1296$$

$$m = \frac{12 \pm \sqrt{1296}}{2.6} = \frac{12 \pm 36}{12} = \begin{cases} m_1 = 4 & 4 - 2 = 2, \\ & \text{Letra B} \\ m_2 = -2 \end{cases}$$

Tarefa Básica - Sistemas Lineares Homogêneos

01. $\begin{bmatrix} 1 & 7 \\ 7 & 1 \end{bmatrix} \cdot \begin{bmatrix} x \\ y \end{bmatrix} = K \begin{bmatrix} x \\ y \end{bmatrix} \Rightarrow \begin{bmatrix} x+7y \\ 7x+y \end{bmatrix} = \begin{bmatrix} Kx \\ Ky \end{bmatrix}$

$$\begin{cases} x + 7y = Kx \\ 7x + y = Ky \end{cases} \Rightarrow \begin{cases} -Kx + x + 7y = 0 \\ 7x - Ky + y = 0 \end{cases}$$

não consegui achar a solução.

02.
$$\begin{cases} 3x + 4y - z = 0 \\ 2x - y + 3z = 0 \\ x + y = 0 \end{cases} \quad \begin{matrix} Dx = 0 \\ Dy = 0 \\ Dz = 0 \end{matrix}$$

$$x = -y$$

$$\begin{pmatrix} 3 & 4 & -1 & 0 \\ 2 & -1 & 3 & 0 \\ -3 & -2 & 1 & 0 \end{pmatrix} \sim \begin{pmatrix} 0 & 1 & -4 & -3 \\ 0 & -3 & 1 & -2 \\ 0 & 0 & -11 & -11 \end{pmatrix}$$

$$\begin{cases} 3x + 4y - z = 0 \\ 3(-y) + 4y - 1 = 0 \\ -3y + 4y = 1 \end{cases} \quad \begin{matrix} x = -y \\ x = -1 \\ y = 1 \end{matrix}$$

$$\begin{matrix} -11z = -11 \\ z = 1 \end{matrix}$$

$$V = \{(-1, 1, 1)\}$$

Let na D

03.
$$\begin{cases} x + y + z = 0 \\ Kx + 3y + 4z = 0 \\ x + Ky + 3z = 0 \end{cases} \quad D = \begin{vmatrix} 1 & 1 & 1 \\ K & 3 & 4 \\ 1 & K & 3 \end{vmatrix} = K^2 - 7K + 10$$

$$K^2 - 7K + 10 = 0$$

$$D = K^2 - 7K + 10 = 0$$

$$\Delta = (-7)^2 - 4 \cdot 1 \cdot (10)$$

$$K_1 = 2$$

$$2 + 5 = 7$$

$$\Delta = 49 - 40$$

$$K = \frac{7 \pm \sqrt{9}}{2} = \frac{7 \pm 3}{2}$$

$$\text{Let na D}$$

$$\Delta = 9$$

$$K_2 = 5$$

04.
$$\begin{cases} x + Ky = 0 \\ Kx + y = 0 \\ x + Ky = 0 \end{cases} \quad D = \begin{vmatrix} 1 & 0 & K \\ K & 1 & 0 \\ 1 & K & 0 \end{vmatrix} = K^3 - K$$

$$K^3 - K \neq 0$$

$$K(K^2 - 1) \neq 0$$

$$S = \{K \in \mathbb{R} \mid K \neq 0, K \neq 1, K \neq -1\}$$

$$K^2 - 1$$

$$K_1 = 1$$

$$\Delta = 0^2 - 4 \cdot 1 \cdot (-1)$$

$$K = \frac{0 \pm 2}{2} =$$

$$\Delta = 4$$

$$K_2 = -1$$

S	T	Q	Q	S	S	D
L/M	M/T	M/W	J/T	V/F	S/S	D/S

05.
$$\begin{cases} -x + 2y - 3 = 0 \\ 3x - y + 3 = 0 \end{cases} \Rightarrow \begin{cases} 3x - y = -3 \\ 3x + 3 = y \end{cases}$$

$$-x + 2y - 3 = 0$$

$$-x + 2(3x + 3) = 3$$

$$-x + 6x + 6 = 3$$

$$5x = -3$$

$$x = -3/5$$

$$y = 3x + 3$$

$$y = 3\left(-\frac{3}{5}\right) + 3$$

$$y = \frac{-9}{5} + 3 = \frac{-9 + 15}{5} = \frac{6}{5}$$

Letra B