

Tarefa Básica.

Sistemas lineares Homogêneos.

1-

$$\begin{pmatrix} x \\ y \end{pmatrix}$$

$$\begin{pmatrix} 1 & 7 \\ 7 & 1 \end{pmatrix}$$

$$\begin{pmatrix} x & 7y \\ 7x & y \end{pmatrix} = \begin{pmatrix} xK \\ yK \end{pmatrix} \rightarrow \begin{cases} x + 7y = xK \\ 7x + y = yK \end{cases}$$

$$\rightarrow \begin{pmatrix} 1 & 7 & : & K \\ 7 & 1 & : & K \end{pmatrix} \sim \begin{pmatrix} 1 & 7 & : & K \\ 0 & -48 & : & -6K \end{pmatrix} \rightarrow \begin{aligned} -48y &= -6K \\ y &= \frac{-6K}{-48} = \frac{K}{8} \end{aligned}$$

$$\rightarrow y = \frac{-K}{-8} \cdot (-1) \quad y = \frac{K}{8} \quad K = 8y$$

$$x + 7y = 8y \quad x = 8y - 7y$$

$$\frac{x}{x} = \frac{8y - 7y}{8y - 7y}$$

$$1 = y$$

$$K = 8 \cdot 1$$

$$K = 8$$

(E)

2-

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

$$\rightarrow \begin{pmatrix} 1 & 1 & 0 & : & 0 \\ 1 & 1 & 0 & : & 0 \end{pmatrix} \rightarrow 2 \text{ filas iguais} \rightarrow \text{indeterminado (várias soluções)}$$

(D)

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S T Q Q S S D

$$y = \infty$$

$$x + y = 0$$

$$x + \infty = 0$$

$$x = -\infty$$

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

$$2(-\infty) - \infty + 3z = 0$$

$$-2\infty - \infty + 3z = 0$$

$$-3\infty + 3z = 0$$

$$3z = 3\infty$$

$$z = \infty$$

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

3)

$$3 + 4k + 3k = 7k + 3$$

$$\begin{cases} x + y + z = 0 \\ kx + 3y + 4z = 0 \\ x + ky + 3z = 0 \end{cases}$$

$$\begin{vmatrix} 1 & 1 & 1 & | & 1 & 1 \\ k & 3 & 4 & | & k & 3 \\ 1 & k & 3 & | & 1 & k \end{vmatrix}$$

$$9 + 4 + k^2$$

$$(k^2 + 13) - (7k + 3)$$

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

$$2 + 5 = 7$$

$$2 \cdot 5 = 10$$

$$k' + k''$$

(D)

$$2 + 5 = 7$$

$$4) \begin{cases} x + 0 + kz = 0 \\ kx + y + 0 = 0 \\ x + ky + 0 = 0 \end{cases}$$

$$\begin{pmatrix} 1 & 0 & k & | & 0 \\ k & 1 & 0 & | & 0 \\ 1 & k & 0 & | & 0 \end{pmatrix} \sim \begin{pmatrix} 1 & 0 & k & | & 0 \\ 1-k^2 & 0 & 0 & | & 0 \end{pmatrix}$$

$$x = \frac{0}{1-k^2}$$

SOLUÇÃO ÚNICA $\neq 0$
 $k \neq 0$

(A)

$$1-k^2 \neq 0 \rightarrow 1 \neq k^2 \rightarrow k \neq 1$$

$$V = \{k \in \mathbb{R} / k \neq 0, k \neq 1, k \neq -1\}$$

$$5. \begin{cases} -x + 2y - 3 = 0 \\ 3x - y + 3 = 0 \\ 2x - 4y + 6 = 0 \end{cases}$$

$$\begin{array}{l} \text{R}_3 \\ \text{R}_1 \\ \text{R}_2 \end{array} \left(\begin{array}{cc|c} -1 & 2 & 3 \\ 3 & -1 & -3 \\ 2 & -4 & -6 \end{array} \right) \sim \left(\begin{array}{cc|c} 0 & 5 & 6 \\ 0 & 0 & 0 \end{array} \right) \quad \begin{array}{l} 5y = 6 \\ y = \frac{6}{5} \end{array}$$

$$-x + 2 \cdot \frac{6}{5} = 3 \quad \Delta \quad -x = \frac{15}{5} - \frac{12}{5}$$

$$-x + \frac{12}{5} = 3$$

$$-x = 3 - \frac{12}{5}$$

$$-x = \frac{3}{5} \cdot (-1)$$

$$x = -\frac{3}{5}$$

indeterminado

(B)