

Seg Ter Qua Qui Sex Sáb Dom

/ /

## Tarefa Básica 7

### Discussão de sistemas lineares

1.

$$A) \begin{pmatrix} a & 4 & : & 1 \\ 1 & 2 & : & 0,5 \end{pmatrix} \sim \begin{pmatrix} a-2 & 0 & : & 0 \\ & & & \end{pmatrix} \quad \begin{matrix} (a-2)x = 0 \\ x = \frac{0}{a-2} \end{matrix}$$

~~2/50~~

B)  $x = \frac{0}{a-2} = \frac{0}{2-2} = \frac{0}{0}$  } indeterminado / Verdadeiro

C) se  $a \neq 2$ , apresenta solução única, ou seja, mais de um valor. ~~2/50~~

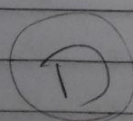
D) se  $a=2$ , apresenta infinitas soluções:  $x = \frac{0}{2-2} = \frac{0}{0}$  ~~2/50~~

E) Caso  $a=2$ , é indeterminado. ~~2/50~~

2. I)  $\begin{pmatrix} 1 & k & : & 1 \\ k & 1 & : & 1-k \end{pmatrix} \sim \begin{pmatrix} 1 & k & : & 1 \\ 0 & 1-2k & : & 1-k^2 \end{pmatrix} \quad \begin{matrix} y = \frac{1-k^2}{1-2k} \\ \text{não pode ser} \\ \text{indeterminado} \end{matrix}$

II)  $k=0,5 \quad y = \frac{1-0,5^2}{1-2 \cdot 0,5} = \frac{0,75}{0}$  impossível

III)  $k \neq 0,5 \rightarrow$  S.P. Determinado (mais de 1 valor p/ k)



nenhuma está correta

3)

A)

$$A = \begin{pmatrix} 1 & 2 & c \\ 0 & 1 & 1 \\ 3 & 2 & 2 \end{pmatrix} \quad A = \begin{pmatrix} 1 & 2 & c \\ 0 & 1 & 1 \\ 3 & 2 & 2 \end{pmatrix} \quad \det A = 6 - 3c$$

B)

$$\begin{pmatrix} 1 & 2 & c & 1 \\ 0 & 1 & 1 & 2 \\ 3 & 2 & 2 & -1 \end{pmatrix} \sim \begin{pmatrix} 1 & 0 & c-2 & -3 \\ 0 & 1 & 1 & 2 \\ 0 & 0 & -3c+6 & 4 \end{pmatrix}$$

S.P. Det  
 $D \neq 0$

$$Z = 4$$

$$-3c+6$$

$$c=2 \rightarrow -3 \cdot 2 + 6 = 0$$

"c" deve ser  $\neq 2$  para  
Haver 1 solução.

$$c \in \mathbb{R} - \{2\}$$

4)

$$\begin{pmatrix} 1 & -1 & 0 & k \\ 12 & -k & 1 & 1 \\ 36 & 0 & k & 2 \end{pmatrix} \sim \begin{pmatrix} 1 & -1 & 0 & k \\ 0 & -k+12 & 1 & 1-12k \\ 0 & 36 & k & 2-36k \end{pmatrix}$$

$$\sim \begin{pmatrix} 1 & -1 & 0 & k \\ 0 & k^2-12k+36 & 0 & 2-12k^2-37k \end{pmatrix} \quad y = \frac{12k^2-37k+2}{k^2-12k+36} \neq 0$$

E

$$k \neq 6$$

$$\begin{cases} 6 + 6 = 12 \\ 6 \cdot 6 = 36 \end{cases}$$



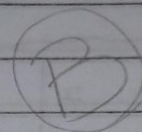
$$5. \left( \begin{array}{ccc|c} 1 & -1 & 1 & 6 \\ -1 & 2 & 1 & -3 \\ -1 & 1 & 2 & -5 \end{array} \right) \sim \left( \begin{array}{ccc|c} 1 & -1 & 1 & 6 \\ 0 & 3 & 2 & -3 \\ 0 & 3 & -2 & -11 \end{array} \right)$$

$$\sim \left( \begin{array}{ccc|c} 1 & -1 & 1 & 6 \\ 0 & 3 & 2 & -3 \\ 0 & 0 & -4 & -4 \end{array} \right) \quad \begin{array}{l} -Z = -4 : (-1) \quad 3y - 12 = -15 \quad x + 1 + 4 = 6 \\ Z = 4 \quad 3y = -3 \quad x = 1 \\ y = -1 \end{array}$$

S.P. Determinado

x, y, z

$$1 \cdot -1 \cdot 4 = -4$$



$$6. \left( \begin{array}{ccc|c} 1 & 1 & 1 & k \\ k & 1 & 1 & 1 \\ -1 & 1 & -1 & k \end{array} \right) \sim \left( \begin{array}{ccc|c} 1 & 1 & 1 & k \\ 0 & 1-k & 1-k & 1-k^2 \\ 0 & 0 & -2 & 0 \end{array} \right) \quad \begin{array}{l} -2Z = 0 \\ Z = 0 \end{array}$$

$$(1-k)y + (1+k) \cdot 0 = 1-k^2$$

$$(1-k)y = 1-k^2$$

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

$$1-k$$

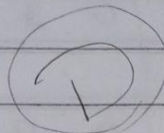
$$k^2 = 1$$

$$k = 1$$

$$1-k=0$$

$$k=1$$

se  $k=1 \rightarrow$  S.P. Indeterminado



$$7. \left( \begin{array}{ccc|c} 1 & 1 & 1 & 1 \\ m & -2 & 4 & 5 \\ -4 & m^2 & 4 & 16 \end{array} \right) \sim \left( \begin{array}{ccc|c} 1 & 1 & 1 & 1 \\ m+2 & 0 & 6 & 7 \\ m^2-4 & 0 & 12 & 21 \end{array} \right) \sim \left( \begin{array}{ccc|c} 1 & 1 & 1 & 1 \\ 0 & 0 & 0 & 7 \\ m^2-2m-8 & 0 & 0 & 7 \end{array} \right)$$

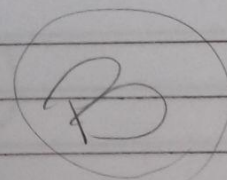
$$x = \frac{7}{m^2-2m-8} = 0$$

$$-2 + 4 = 2$$

$$x' + x'$$

$$-2 \cdot 4 = -8$$

$$-2 + 4 = 2$$



# Tarefa Básica 7

## Sistemas Lineares Homogêneos

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

$$\begin{pmatrix} 1 & 7 \\ 7 & 1 \end{pmatrix} \begin{pmatrix} x+7y \\ 7x+y \end{pmatrix} = \begin{pmatrix} xK \\ yK \end{pmatrix} \quad \begin{cases} x+7y = xK \\ 7x+y = yK \end{cases}$$

$$D = \begin{vmatrix} 1 & 7 \\ 7 & 1 \end{vmatrix} \quad 1-49 = -48 \quad x = \frac{-6K}{-48} \rightarrow x = \frac{-K}{-8}$$

$K = 8x$

$$D_x = \begin{vmatrix} K & 7 \\ K & 1 \end{vmatrix} \quad K-7K = -6K \quad 7x+y = y \cdot 8x$$

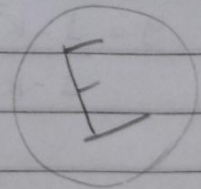
$$\frac{y}{y} = 8x - 7x$$

$x = 1$

$$D_y = \begin{vmatrix} 1 & K \\ 7 & K \end{vmatrix} \quad K-7K = -6K$$

$K = 8x$

$K = 8$





2.

$$\begin{array}{l} \rightarrow \left( \begin{array}{ccc|c} 3 & 4 & -1 & 0 \\ 2 & -1 & 3 & 0 \\ -3 & -2 & 1 & 0 \end{array} \right) \sim \left( \begin{array}{ccc|c} 3 & 0 & -1 & 0 \\ 0 & -3 & 3 & 0 \\ 0 & 0 & 0 & 0 \end{array} \right) \sim \left( \begin{array}{ccc|c} 1 & 0 & -1/3 & 0 \\ 0 & -3 & 3 & 0 \\ 0 & 0 & 0 & 0 \end{array} \right) \end{array}$$

$$x = \frac{0}{0} \quad y = \frac{0}{0} \quad z = \frac{0}{0} \quad \Delta$$

Admite infinitas  
soluções

(1)

3.

$$\begin{array}{l} \left( \begin{array}{ccc|c} 1 & 1 & 1 & 0 \\ k & 3 & 4 & 0 \\ 1 & k & 3 & 0 \end{array} \right) \sim \left( \begin{array}{ccc|c} 1 & 1 & 1 & 0 \\ k & 3 & 4 & 0 \\ 1 & k & 3 & 0 \end{array} \right) \sim \left( \begin{array}{ccc|c} 1 & 1 & 1 & 0 \\ 0 & 2 & 3 & 0 \\ 0 & k-1 & 2 & 0 \end{array} \right) \sim \left( \begin{array}{ccc|c} 1 & 1 & 1 & 0 \\ 0 & 2 & 3 & 0 \\ 0 & 0 & 2-k & 0 \end{array} \right) \end{array}$$

$9 + 4 + k^2 - 3 - 4k - 3k$

(1)

$$k' + k''$$

$$2 + 5 = 7$$

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

$$2 + 5 = 7$$

$$2 \cdot 5 = 10$$

4.

$$\begin{array}{l} \left( \begin{array}{ccc|c} 1 & 0 & k & 0 \\ -k & k & 1 & 0 \\ 1 & k & 0 & 0 \end{array} \right) \sim \left( \begin{array}{ccc|c} 1 & 0 & k & 0 \\ 0 & 1 & 1-k & 0 \\ 0 & 0 & 1-k^2 & 0 \end{array} \right) \end{array}$$

$$x = 0$$

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

$$kz = 0$$

$$z = 0$$

$$k \neq 0$$

$$-1 + 1 = 0$$

$$-1 \cdot 1 = -1$$

$$\{k \in \mathbb{R} \mid k \neq 0, k \neq 1, k \neq -1\}$$

(A)

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5.

$$\begin{array}{l} 2 \ 3 \left( \begin{array}{ccc|c} -1 & 2 & 3 & 0 \\ 4 & 3 & -1 & -3 \\ 2 & -4 & -6 & -6 \end{array} \right) \sim \left( \begin{array}{ccc|c} 0 & 5 & 6 & 6 \\ 0 & 0 & 0 & 0 \end{array} \right) \end{array}$$

$$5y = 6$$

$$-x + 2 \cdot 6 = 3$$

$$y = \frac{6}{5}$$

$$-x + 12 = 3$$

$$-x + 12 = 3$$

$$-x = 3 - 12$$

$$-x = -9$$

$$x = 9$$

(B)

S.P. Determinado  $\frac{N \neq 0}{D \neq 0}$

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

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

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