

STOQSSD

1/1

Tarefa Básica

1- $A = \begin{bmatrix} x & 1 \\ 5 & 3 \end{bmatrix}$ $B = \begin{bmatrix} 3 & -1 \\ y & 2 \end{bmatrix}$

$\begin{bmatrix} x & 1 \\ 5 & 3 \end{bmatrix} \cdot \begin{bmatrix} 3 & -1 \\ y & 2 \end{bmatrix} = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$

$$\begin{aligned} 15 + 3y &= 0 & -x + 2 &= 0 & 3x + y &= 1 \\ 3y &= -15 & -x &= -2 & -x + 2 &= 0 \\ y &= \frac{-15}{3} & x &= 2 & 15 + 3y &= 0 \\ & & & & -5 + 6 &= 1 \\ y &= -5 & & & & \end{aligned}$$

C

2- $1 + 3k + 0$

$\begin{bmatrix} 1 & 0 & 1 & 1 & 0 \\ k & 1 & 3 & k & 1 \end{bmatrix} = \begin{bmatrix} 3 + k^2 - (1 + 3k) = 0 \\ k^2 - 3k + 2 = 0 \end{bmatrix}$

$3 + k^2$ $\Delta = (-3)^2 - 4 \cdot 1 \cdot 2$

$\Delta = 9 - 8$

$\Delta = 1$

$k = \frac{3 \pm 1}{2}$

$x' = \frac{4}{2} = 2$

$x'' = \frac{2}{2} = 1$

C

3-

$A = \begin{bmatrix} 3 & 5 \\ 2 & 4 \end{bmatrix}$ $\begin{bmatrix} 4 & -5 \\ 2 & 2 \end{bmatrix}$

$12 - 10 = 2$ $\begin{bmatrix} -2 & 3 \\ 2 & 2 \end{bmatrix}$ $= \begin{bmatrix} 2 & -5/2 \\ 1 & 3/2 \end{bmatrix}$

C

$$20 + 2x + 3x = 20 + 5x$$

$$4- \begin{array}{|c|c|c|} \hline x & 1 & 2 \\ \hline 3 & 1 & 2 \\ \hline 10 & 1 & x \\ \hline \end{array} \begin{array}{|c|c|} \hline x & 1 \\ \hline 3 & 1 \\ \hline 10 & 1 \\ \hline \end{array}$$

$$x^2 + 20 + 6 = x^2 + 26$$

$$(x^2 + 20 + 6 = x^2 + 26) \quad (x^2 - 5x + 6 = 0) \quad (x \neq \frac{5 \pm 1}{2})$$

$$20 + 2x + 3x = 20 + 5x \quad \Delta = (-5) - 4 \cdot 1 \cdot 6$$

$$\Delta = 25 - 24$$

$$x^2 + 26 - (20 + 5x) \neq 0$$

$$\Delta = 1$$

$$x' = \frac{6}{2} = 3$$

$$x^2 - 5x + 6 \neq 0$$

$$x'' = \frac{4}{2} = 2$$

A

$$2+2+2=6$$

$$5- \begin{array}{|c|c|c|} \hline -1 & -1 & 2 \\ \hline 2 & 1 & -2 \\ \hline 1 & 1 & -1 \\ \hline \end{array} \begin{array}{|c|c|} \hline -1 & -1 \\ \hline 2 & 1 \\ \hline 1 & 1 \\ \hline \end{array} = 7 - 6 = 1$$

$$1+2+4=7$$

$$\text{Soma } A = A + A'$$

$$A' = \begin{bmatrix} 1 & 0 & 1 \\ 1 & -1 & 0 \\ 0 & 2 & 1 \end{bmatrix}$$

$$\begin{bmatrix} -1 & -1 & 2 \\ 2 & 1 & -2 \\ 1 & 1 & -1 \end{bmatrix}$$

+

$$A'' = \begin{bmatrix} 1 & 1 & 0 \\ 0 & -1 & 2 \\ 1 & 0 & 1 \end{bmatrix}$$

$$\begin{bmatrix} 1 & 1 & 0 \\ 0 & -1 & 2 \\ 1 & 0 & 1 \end{bmatrix} = \begin{bmatrix} 0 & 0 & 2 \\ 2 & 0 & 0 \\ 2 & 1 & 0 \end{bmatrix}$$

$$A^+ = \begin{bmatrix} 1 & 1 & 0 \\ 0 & -1 & 2 \\ 1 & 0 & 1 \end{bmatrix} \div 1$$

6-

A e B: invertíveis de mesma ordem

 $x = ?$

$$x \text{ e } (x \cdot A)^+ = B$$

$$((x \cdot A)^+)^+ = B$$

$$x \cdot A = B^+$$

$$x \cdot A \cdot A^{-1} = B^+ \cdot A^{-1}$$

$$x = B^+ \cdot A^{-1}$$

$$7- B = \begin{bmatrix} x \\ y \end{bmatrix} \quad C = \begin{bmatrix} 4x + 5y \\ 5x + 6y \end{bmatrix} \quad \rightarrow A^{-1} \rightarrow A \cdot B = C$$

$$A \cdot B = C \quad \rightarrow \quad \begin{matrix} C \\ \div \\ B \end{matrix} = A$$

$$A = C / B$$

$$A = \begin{bmatrix} 4 & 5 \\ 5 & 6 \end{bmatrix} = 24 - 25$$

$$\det A = -1$$

$$\text{ORDEN 2} = \begin{bmatrix} 6 & -5 \\ -5 & 4 \end{bmatrix} \div (-1)$$

$$A^{-1} = \begin{bmatrix} -6 & 5 \\ 5 & -4 \end{bmatrix} \quad D$$

$$8- A = \begin{bmatrix} 2 & k \\ -2 & 1 \end{bmatrix}$$

$$\det A = \det A^{-1}$$

soma de k

$$\det A = 2 \cdot (-2k) = -4k$$

$$\det A = \det A^{-1}$$

$$\frac{-4k}{-4k} = 1$$

$$(2+2k) \cdot (2+2k)$$

$$4 + 4k + 4k + 4k^2$$

$$4k^2 + 8k + 4$$

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

$$\Delta = 64 - 64 = 0$$

$$k = \frac{-8 \pm 0}{8}$$

$$8$$

$$k' = \frac{-8}{8} = -1$$

$$8$$

$$k'' = \frac{-8}{8} = -1$$

$$8$$

$$k_1 + k_2$$

$$(-1) + (-1) = -2$$

$$B$$

9-

A e B: ORDEM 2

$$\det A \neq 0$$

$$\det B \neq 0$$

$$a-) (A+B) \cdot (A-B)$$

$$A^2 - AB + BA - B^2$$

$$b-) (A+B)^2 = (A+B) \cdot (A+B)$$

$$A^2 + AB + BA + B^2 \rightarrow AB + BA$$

$$A^2 + 2AB + B^2$$



AB e BA, na multiplicação não importa a ordem dos produtos não altera o resultado, essa é a condição

S T Q Q S S D

$$c) \frac{\det A}{\det B} \quad \det(-A) = (-1)^2 \cdot \det A = \det A \neq 0$$

$$\det A = 1$$

$$\det A$$

$$d) \det(AB) = 1$$

$$\det(A) \cdot \det(B) = 1$$

$$\left| \frac{\det B = 1}{\det A} \right|$$