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Tarefa Básica - Matrizes

01. $A = (a_{ij})_{3 \times 2}$, $a_{ij} = 2i + 3j$

$$A = \begin{bmatrix} 5 & 8 \\ 7 & 10 \\ 9 & 12 \end{bmatrix}$$

$$a_{11} = 2 \cdot 1 + 3 \cdot 1 = 5$$

$$a_{22} = 2 \cdot 2 + 3 \cdot 2 = 10$$

$$a_{12} = 2 \cdot 1 + 3 \cdot 2 = 8$$

$$a_{31} = 2 \cdot 3 + 3 \cdot 1 = 9$$

$$a_{21} = 2 \cdot 2 + 3 \cdot 1 = 7$$

$$a_{32} = 2 \cdot 3 + 3 \cdot 2 = 12$$

02. $A = (a_{ij})_{2 \times 2}$, $a_{ij} = i^2 + 4j^2$

$$A = \begin{bmatrix} 5 & 17 \\ 8 & 20 \end{bmatrix}$$

$$a_{11} = 1^2 + 4 \cdot 1^2 = 5$$

$$a_{21} = 2^2 + 4 \cdot 1^2 = 8$$

$$a_{12} = 1^2 + 4 \cdot 2^2 = 17$$

$$a_{22} = 2^2 + 4 \cdot 2^2 = 20$$

LETRA A_n

03. $\begin{bmatrix} 1 & x+2 \\ y-1 & z+1 \end{bmatrix} = \begin{bmatrix} 1 & -x \\ 2y & -2z \end{bmatrix} \Rightarrow \begin{bmatrix} 1 & 1 \\ -2 & 2/3 \end{bmatrix} = \begin{bmatrix} 1 & 1 \\ -2 & 2/3 \end{bmatrix}$

$$x+2 = -x$$

$$2y = y-1$$

$$z+1 = -2z$$

$$x+x = -2$$

$$2y-y = -1$$

$$z+2z = -1-1$$

$$2x = -2$$

$$y = -1$$

$$3z = -1$$

$$x = -1$$

$$y = -1$$

$$z = -1/3$$

04. $\begin{bmatrix} 3 & -x \\ 3x & x \end{bmatrix} = \begin{bmatrix} 3 & y \\ 2x+1 & z-1 \end{bmatrix} \Rightarrow \begin{bmatrix} 3 & 1 \\ 3 & 1 \end{bmatrix}$

$$3x = 2x+1$$

$$y = -x$$

$$z-1 = 1$$

$$3x-2x = 1$$

$$y = -1$$

$$z = 1+1$$

$$x = 1$$

$$y = -1$$

$$z = 2$$

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DATA / FECHA / DATE

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

05.

	0	1	$\sqrt{2}$	1
LETRA	1	0	1	$\sqrt{2}$
B	$\sqrt{2}$	1	0	1
	1	$\sqrt{2}$	1	0

$$a_{11} = 0$$

Quando $i = j$ o valor é 0

$$a_{12} = 1$$

$$a_{13} = \sqrt{1^2 + 1^2}$$

Quando $i - j = 1$ ou $j - i = 1$

$$a_{13} = \sqrt{1+1}$$

Valor é 1

$$a_{13} = \sqrt{2}$$

Quando no quadrado o i e j formam uma diagonal o valor é $\sqrt{2}$

$$06. A = \begin{bmatrix} -1 & 2 & 3 \end{bmatrix}, B = \begin{bmatrix} 0 & -2 & 1 \end{bmatrix}$$

$$2A - B = 2 \cdot \begin{bmatrix} -1 & 2 & 3 \end{bmatrix} - \begin{bmatrix} 0 & -2 & 1 \end{bmatrix} = \begin{bmatrix} -2 & 4 & 6 \end{bmatrix} - \begin{bmatrix} 0 & -2 & 1 \end{bmatrix} = \begin{bmatrix} -2 & 6 & 5 \end{bmatrix} \text{ LETRA D}$$

$$07. A = \begin{bmatrix} 1 & 2 & 3 & 4 & 5 & 6 \end{bmatrix}, B = \begin{bmatrix} -1 & 3 & 2 & 2 & 0 & 1 \end{bmatrix}$$

$$A - B^T = \begin{bmatrix} 1 & 2 & 3 & 4 & 5 & 6 \end{bmatrix} - \begin{bmatrix} -1 & 2 & 3 & 0 & 2 & 1 \end{bmatrix} = \begin{bmatrix} 2 & 0 & 0 & 4 & 3 & 5 \end{bmatrix} \text{ LETRA B}$$

$$08. A = A^T \quad A = \begin{bmatrix} 2 & -1 & 2y \\ x & 0 & -z \\ 4 & 3 & 2 \end{bmatrix}$$

$$\begin{bmatrix} 2 & -1 & 2y \\ x & 0 & -z \\ 4 & 3 & 2 \end{bmatrix} = \begin{bmatrix} 2 & x & 4 \\ -1 & 0 & 3 \\ 2y & -z & 2 \end{bmatrix} \quad \begin{aligned} x &= -1 & 2y &= 4 & -z &= 3 \cdot (-1) \\ & & y &= 2 & z &= -3 \end{aligned}$$

$$x + y + z = -1 + 2 + 3 = 4 \text{ LETRA A}$$

09.

$$A = (a_{ij})_{3 \times 2} \begin{cases} a_{ij} = i + j, \text{ se } i \neq j \\ a_{ij} = 1, \text{ se } i = j \end{cases}$$

$$B = (b_{ij})_{3 \times 2} \begin{cases} b_{ij} = 0, \text{ se } i \neq j \\ b_{ij} = 2i - j, \text{ se } i = j \end{cases}$$

$$A = \begin{bmatrix} 1 & 3 \\ 3 & 1 \\ 4 & 5 \end{bmatrix}$$

$$a_{11} \text{ e } a_{22} = 1$$

$$a_{12} \text{ e } a_{21} = 3$$

$$a_{31} = 4 \quad a_{32} = 5$$

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

$$a_{11} = 2 \cdot 1 - 1 = 1$$

$$a_{22} = 2 \cdot 2 - 2 = 2$$

$$A + B = \begin{bmatrix} 1 & 3 \\ 3 & 1 \\ 4 & 5 \end{bmatrix} + \begin{bmatrix} 1 & 0 \\ 0 & 2 \\ 0 & 0 \end{bmatrix} = \begin{bmatrix} 2 & 3 \\ 3 & 3 \\ 4 & 5 \end{bmatrix} \quad \text{Letra C}$$

10. $\begin{matrix} 3 \\ 2 \end{matrix} \cdot M + \begin{matrix} 2 \\ 3 \end{matrix} N = P$

$$\begin{matrix} 3 \\ 2 \end{matrix} \cdot \begin{bmatrix} x & 8 \\ 10 & y \end{bmatrix} + \begin{matrix} 2 \\ 3 \end{matrix} \cdot \begin{bmatrix} y & 6 \\ 12 & x+4 \end{bmatrix} = \begin{bmatrix} 7 & 16 \\ 23 & 13 \end{bmatrix}$$

$$\begin{matrix} 3x & 24 \\ 20 & 2y \end{matrix} + \begin{matrix} 2y & 12 \\ 36 & 2x+8 \end{matrix} = \begin{bmatrix} 7 & 16 \\ 23 & 13 \end{bmatrix}$$

$$\begin{bmatrix} 3x & 24 \\ 20 & 2y \end{bmatrix} + \begin{bmatrix} 2y & 12 \\ 36 & 2x+8 \end{bmatrix} = \begin{bmatrix} 7 & 16 \\ 23 & 13 \end{bmatrix}$$

10 (cont.)

$$\frac{3x}{2} + \frac{2y}{3} = 7$$

$$\frac{9x+4y}{6} = 7$$

$$9x+4y=42 \text{ (I)}$$

$$\frac{3y}{2} + \frac{2x+8}{3} = 13$$

$$\frac{9y+4x+16}{6} = 13$$

$$9y+4x+16=78 \text{ (II)}$$

$$9y+4x+16 - (9x+4x) = 78 - 42$$

$$9y+4x-9x-4y = 36-16$$

$$5y-5x=20$$

$$5(y-x)=20$$

$$y-x=\frac{20}{5}$$

$$y-x=4$$

Subtração da equação
I e II