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1ª Tarefa Básica - Matrizes

01 $A = (a_{ij})_{3 \times 2}$

$$\begin{vmatrix} 11 & 12 \\ 21 & 22 \\ 31 & 32 \end{vmatrix} \quad i \times j$$

$$a_{ij} = 2i + 3j$$

$$A = \begin{bmatrix} 5 & 8 \\ 7 & 10 \\ 9 & 12 \end{bmatrix}_{3 \times 2}$$

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

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

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

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

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

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

02 $A = (a_{ij})_{2 \times 2}$

$$a_{ij} = i^2 + 4j^2$$

$$\begin{vmatrix} 11 & 12 \\ 21 & 22 \end{vmatrix} \quad 2 \times 2$$

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

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

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

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

$$A = \begin{bmatrix} 5 & 17 \\ 8 & 20 \end{bmatrix}_{2 \times 2}$$

03 $\begin{array}{l} \text{I} \quad x + 2 = -x \rightarrow x + x = -2 \rightarrow 2x = -2 \rightarrow x = -1 \\ \text{II} \quad y - 1 = 2y \rightarrow 2y - y = -1 \rightarrow y = -1 \\ \text{III} \quad 3 + 1 = -2z \rightarrow 3 + 2z = -1 \rightarrow 3z = -1 \rightarrow z = -\frac{1}{3} \end{array}$

04 $3x = 2x + 1$

$$3x - 2x = 1$$

$$x = 1$$

$$\begin{cases} y = -x \\ y = -1 \end{cases}$$

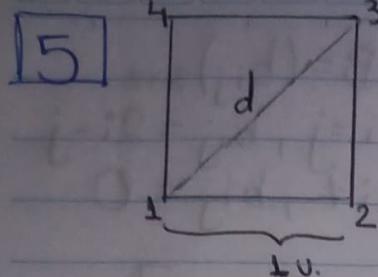
$$x = 3 - 1$$

$$3 - 1 = 1$$

$$3 = 1 + 1$$

$$3 = 2$$

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$$d = l\sqrt{2}$$

$$d = 1 \cdot \sqrt{2}$$

$$d = \sqrt{2}$$

$$A = \begin{bmatrix} 0_{11} & 1_{12} & \sqrt{2}_{13} & 1_{14} \\ 1_{21} & 0_{22} & 1_{23} & \sqrt{2}_{24} \\ \sqrt{2}_{31} & 1_{32} & 0_{33} & 1_{34} \\ 1_{41} & \sqrt{2}_{42} & 1_{43} & 0_{44} \end{bmatrix}_{4 \times 4}$$

(B)

$$\boxed{6} \quad A = \begin{bmatrix} -1 \\ 2 \\ 3 \end{bmatrix} \quad B = \begin{bmatrix} 0 \\ -2 \\ 1 \end{bmatrix}$$

$$x_{11} = 2(-1) - 0 = -2$$

$$x_{21} = 2(2) - (-2) = 6$$

$$x_{31} = 2(3) - 1 = 5$$

$$2A - B = \begin{bmatrix} -2 \\ 6 \\ 5 \end{bmatrix}_{3 \times 1}$$

$$\boxed{7} \quad B^t = \begin{bmatrix} -1 & 2 \\ 3 & 0 \\ 2 & 1 \end{bmatrix}_{3 \times 2}$$

$$A - B^t = \begin{bmatrix} 2 & 0 \\ 0 & 4 \\ 3 & 5 \end{bmatrix}_{3 \times 2}$$

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

$$2 - 2 = 0$$

$$3 - 3 = 0$$

$$\boxed{8} \quad A^t = \begin{bmatrix} 2 & x & 4 \\ -1 & 0 & 3 \\ 2y & -3 & 2 \end{bmatrix}_{3 \times 3}$$

$$x = -1$$

$$2y = 4 \therefore y = 2$$

$$-3 = 3 \xrightarrow{x(-1)} 3 = -3$$

$$\left. \begin{array}{l} x + y + z \\ = -1 + 2 - 3 \\ = -2 \end{array} \right\}$$

9 $A = (a_{ij})_{3 \times 2}$
 se $i=j$, $a_{ij} = 1$
 se $i \neq j$, $a_{ij} = i+j$

$$\begin{array}{|c c|} \hline 11 & 12 \\ 21 & 22 \\ 31 & 32 \\ \hline \end{array} \quad |_{i \neq j}$$

$$B = (b_{ij})_{3 \times 2}$$

se $i=j$, $b_{ij} = 2i-j$
 se $i \neq j$, $b_{ij} = 0$

$$A = \begin{bmatrix} 1 & 3 \\ 3 & 1 \\ 4 & 5 \end{bmatrix}_{3 \times 2}$$

$$A+B = \begin{bmatrix} 2 & 3 \\ 3 & 3 \\ 4 & 5 \end{bmatrix}_{3 \times 2}$$

$$B = \begin{bmatrix} 1 & 0 \\ 0 & 2 \\ 0 & 0 \end{bmatrix}_{3 \times 2}$$

10 $\frac{3x}{2} + \frac{2y}{3} = 7 \rightarrow 9x + 4y = 42$

$$\frac{3y}{2} + \frac{2(x+4)}{3} = 13 \rightarrow 9y + 4x + 16 = 78 \rightarrow 9y + 4x = 62$$

$$\begin{aligned} 9y + 4x &= 62 \\ -4y - 9x &= -42 \\ 5y - 5x &= 20 \end{aligned}$$

$$5(y-x) = 20 \therefore y-x = 4$$