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Nº 03

CT11 350

Tarefa Básica

1. $A(a_{ij})_{3 \times 2}$

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

$$a_{11} = 2 + 3 = 5$$

$$a_{12} = 2 + 6 = 8$$

$$a_{21} = 4 + 3 = 7$$

$$a_{22} = 4 + 6 = 10$$

$$a_{31} = 6 + 3 = 9$$

$$a_{32} = 6 + 6 = 12$$

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

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

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

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

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

$$a_{11} = 1 + 4$$

$$a_{12} = 1 + 16$$

$$a_{11} = 5$$

$$a_{12} = 17$$

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

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

$$a_{21} = 4 + 4$$

$$a_{22} = 4 + 16$$

$$a_{21} = 8$$

$$a_{22} = 20$$

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

Alternativa A

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

$$x+2 = -x \quad y-1 = 2y \quad z+1 = -2z$$

$$2x = -2 \quad -y = 1 \quad 3z = -1$$

$$x = -1 \quad y = -1 \quad z = -\frac{1}{3}$$

$$\boxed{x = -1, y = -1, z = -\frac{1}{3}}$$

$$4. \begin{bmatrix} 3 & -x \\ 3x & x \end{bmatrix} = \begin{bmatrix} 3 & y \\ 2x+1 & z-1 \end{bmatrix}$$

$$3x = 2x+1 \quad -1 = y \quad 1 = z-1$$

$$x = 1 \quad y = -1 \quad z = 2$$

$$\boxed{x = 1, y = -1, z = 2}$$

$$5. A_{4 \times 4} = \begin{bmatrix} & & & \\ & & & \\ & & & \\ & & & \end{bmatrix}$$

$$a_{ii} = 0 \rightarrow a_{ii} = 0 \text{ se } i = 1$$

$$a_{21} = 2 - 1 = 1$$

$$a_{12} = 1 - \sqrt{2}$$

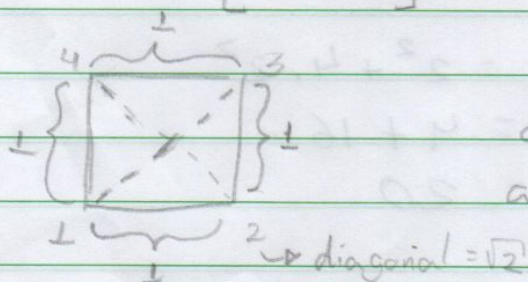
$$a_{21} = 1 - \sqrt{2}$$

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

$$a_{23} = 1$$

$$a_{14} = 1$$

$$a_{24} = \sqrt{2}$$



Alternativa B)

$$a_{21} = \sqrt{2} - 1 \quad a_{41} = 1$$

$$a_{32} = 1 - \sqrt{2} = 0 \quad a_{42} = \sqrt{2}$$

$$a_{34} = 1 \quad a_{43} = 1$$

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

$$b_{ij} = \begin{cases} b_{ij} = 0 & \text{se } i \neq j \\ b_{ii} = 2i - 1 & \text{se } i = j \end{cases}$$

$$b_{11} = 2 - 1 = 1$$

$$b_{22} = 4 - 2 = 2$$

$$b_{33} = 4 - 1 = 3$$

$$b_{44} = 6 - 2 = 4$$

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

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

Alternativa C

$$10. \quad \frac{3}{2}M = \begin{bmatrix} \frac{3x}{2} & 12 \\ 15 & \frac{3y}{2} \end{bmatrix}$$

$$\frac{2}{3}N = \begin{bmatrix} \frac{2y}{3} & 4 \\ 8 & \frac{2(x+4)}{3} \end{bmatrix}$$

$$\frac{3x}{2} + \frac{2y}{3} = 7 \rightarrow \frac{9x+4y}{6} = \frac{42}{6} \Rightarrow 9x+4y=42 //$$

$$\frac{3y}{2} + \frac{2(x+4)}{3} = 13 \rightarrow \frac{9y+4(x+4)}{6} = \frac{78}{6} //$$

$$9y+4x+16=78 \rightarrow 9y+4x=62 //$$

$$4x+9y - (9x+4y) = 62-42$$

$$4x+9y-9x+4y=20$$

$$5y-5x=20$$

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

$$y-x=4$$

Alternativa B

6.

$$2A = \begin{bmatrix} -2 \\ 4 \\ 6 \end{bmatrix}$$

$$2A-B = \begin{bmatrix} -2 \\ 6 \\ 5 \end{bmatrix}$$

Alternativa D

7.

$$B^t = \begin{bmatrix} -1 & 2 \\ 3 & 0 \\ 2 & 1 \end{bmatrix}$$

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

Alternativa B

8.

$$A = \begin{bmatrix} 2 & -1 & 2x \\ x & 0 & -z \\ 4 & 3 & 2 \end{bmatrix}$$

$$A^t = \begin{bmatrix} 2 & x & 4 \\ -1 & 0 & 3 \\ 2x & -z & 2 \end{bmatrix}$$

$$x = -1 \quad y = 2 \quad z = -3$$

$$2 + (-1) + (-3)$$

$$2 + (-4)$$

$$-2$$

Alternativa A

9.

$$a_{ij} = \begin{cases} i+j & \text{se } i \neq j \\ 1 & \text{se } i = j \end{cases}$$

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

$$a_{12} = 3$$

$$a_{31} = 4$$

$$a_{21} = 3$$

$$a_{32} = 5$$