

Beatriz Bastos Borges N°c 3 CTII 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.  $A = (a_{ij})_{2 \times 2}$

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

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

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

$$a_{21} = 1 + 4$$

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

$$a_{11} = 5$$

$$a_{12} = 17$$

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

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

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

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

$$a_{21} = 8$$

$$a_{22} = 20$$

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

Alternativa A

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

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

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

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

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

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

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

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

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

$$5. A_{4 \times 4} = \begin{bmatrix} 1 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 \end{bmatrix}$$

$$a_{i1} = 0 \rightarrow \text{caiu} = 0 \text{ se } i = 1$$

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

$$\begin{array}{c} \overbrace{\begin{pmatrix} 1 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 \end{pmatrix}}^4 \quad \overbrace{\begin{pmatrix} 1 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 \end{pmatrix}}^4 \\ a_{12} = 1-1 = 0 \quad a_{21} = 1 \\ a_{13} = \sqrt{2} \quad a_{23} = 1 \\ a_{14} = 1 \quad a_{24} = \sqrt{2} \\ \downarrow \text{diagonal} = \sqrt{2} \end{array}$$

Alternativa - 01

$$a_{31} = \sqrt{2} \quad a_{41} = 1$$

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

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

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

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

$$b_{11} = 2 - 1 = 1 \quad b_{22} = 4 - 2 = 2$$

$$b_{21} = 4 - 1 = 3 \quad b_{12} = 2 - 1 = 1$$

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

Alternativa C)

$$10. \frac{3}{2}m = \begin{bmatrix} \frac{3x}{2} & 12 \\ 15 & \frac{3y}{2} \end{bmatrix} \quad \frac{2}{3}n = \begin{bmatrix} \frac{2x}{3} & 4 \\ 8 & \frac{2(x+4)}{3} \end{bmatrix}$$

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

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

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

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

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

$$5y - 5x = 20$$

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

$$y-x = 4$$

Alternativa B)

$$6. \quad 2A = \begin{bmatrix} -2 \\ 9 \\ 6 \end{bmatrix} \quad 2A-B = \begin{bmatrix} -2 \\ 6 \\ 5 \end{bmatrix}$$

[Alternativa D]

$$7. \quad B^t = \begin{bmatrix} -1 & 2 \\ 3 & 0 \\ -2 & 1 \end{bmatrix} \quad A-B^t = \begin{bmatrix} 2 & 0 \\ 0 & 4 \\ 3 & 5 \end{bmatrix}$$

[Alternativa B]

$$8. \quad A = \begin{bmatrix} 2 & -1 & 2x \\ x & 0 & -z \\ 4 & 3 & 2 \end{bmatrix} \quad A^t = \begin{bmatrix} 2 & x & 4 \\ -1 & 0 & 3 \\ 2x & -z & 2 \end{bmatrix}$$

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

$$\begin{aligned} 2 + (-1) + (-3) \\ 2 + (-4) \\ -2 \end{aligned}$$

[Alternativa A]

$$9. \quad a_{ij} \begin{cases} a_{ij} = i+j & \text{se } i \neq j \\ a_{ij} = 1 & \text{se } i = j \end{cases}$$

$$A = \begin{bmatrix} 1 & 3 \\ 3 & 1 \\ 4 & 5 \end{bmatrix} \quad \begin{array}{ll} a_{12} = 3 & a_{32} = 4 \\ a_{21} = 3 & a_{31} = 5 \end{array}$$