

Exercício Básica - Matrizes

① $A = \begin{bmatrix} a_{11} & a_{12} \\ a_{21} & a_{22} \\ a_{31} & a_{32} \end{bmatrix}$

$a_{11} \quad a_{21}$

$a_{31} \quad a_{32}$

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

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

$= 2 + 3 = 5$

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

$= 2 + 6 = 8$

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

$= 4 + 3 = 7$

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

$= 4 + 6 = 10$

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

$= 6 + 3 = 9$

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

$= 6 + 6 = 12$

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

② $A = \begin{bmatrix} a_{11} & a_{12} \\ a_{21} & a_{22} \end{bmatrix}$

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

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

$= 1 + 4 = 5$

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

$= 1 + 4 \cdot 4$

$= 1 + 16 = 17$

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

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

$= 4 + 4 = 8$

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

$= 4 + 4 \cdot 4$

$= 4 + 16 = 20$

(A)

③ $\begin{bmatrix} 1 & x+2 \\ y-1 & 2+1 \end{bmatrix} = \begin{bmatrix} 1 & -x \\ 2y & -22 \end{bmatrix}$

$y-1 = 2y$

$y = -1$

$x+2 = -x$

$2x = -2$

$x = -2/2 = -1$

$2+1 = -22$

$32 = -1$

$2 = -1/3$

$x = -1$

$y = -1$

$2 = -1/3$

$$\textcircled{4} \begin{bmatrix} 3 & -x \\ 3x & x \end{bmatrix} = \begin{bmatrix} 3 & y \\ 2x+1 & 2-1 \end{bmatrix} \quad (1)$$

$$3x = 2x + 1$$

$$3x - 2x = 1$$

$$x = 1$$

$$y = -x$$

$$y = -1$$

$$x = 2 - 1$$

$$1 = 2 - 1$$

$$2 = 2$$

$$x = 1$$

$$y = -1$$

$$z = 2$$

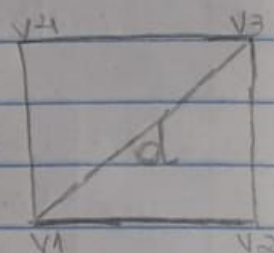
$$\textcircled{5} \begin{bmatrix} a_{11} & a_{12} & a_{13} & a_{14} \\ a_{21} & a_{22} & a_{23} & a_{24} \\ a_{31} & a_{32} & a_{33} & a_{34} \\ a_{41} & a_{42} & a_{43} & a_{44} \end{bmatrix}$$

$$d^2 = a^2 + b^2$$

$$d^2 = 1^2 + 1^2$$

$$d^2 = 2$$

$$d = \sqrt{2}$$



$$a_{11} = V1 - V1 = 0$$

$$a_{12} = V1 - V2 = 1$$

$$a_{13} = V1 - V3 = d = \sqrt{2}$$

$$a_{14} = V1 - V4 = 1$$

$$a_{21} = V2 - V1 = 1$$

$$a_{22} = V2 - V2 = 0$$

$$a_{23} = V2 - V3 = 1$$

$$a_{24} = V2 - V4 = d = \sqrt{2}$$

$$a_{31} = V3 - V1 = d = \sqrt{2}$$

$$a_{32} = V3 - V2 = 1$$

$$a_{33} = V3 - V3 = 0$$

$$a_{34} = V3 - V4 = 1$$

$$a_{41} = V4 - V1 = 1$$

$$a_{42} = V4 - V2 = d = \sqrt{2}$$

$$a_{43} = V4 - V3 = 1$$

$$a_{44} = V4 - V4 = 0$$

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

(B)

$$\textcircled{6} A = \begin{bmatrix} -1 \\ 2 \\ 3 \end{bmatrix}$$

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

$$2A - B$$

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

$$2A - B =$$

$$\begin{bmatrix} -2 \\ 6 \\ 5 \end{bmatrix}$$

(D)

$$\textcircled{7} \quad A = \begin{bmatrix} 1 & 2 \\ 3 & 4 \\ 5 & 6 \end{bmatrix} \quad B = \begin{bmatrix} -1 & 3 & 2 \\ 2 & 0 & 1 \end{bmatrix} \quad A \cdot B^t \quad \textcircled{A}$$

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

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

$$\left. \begin{array}{l} x = -1 \quad -2 = 3 \\ \quad \quad \quad 2 = -3 \\ \quad \quad \quad 2y = 4 \\ \quad \quad \quad y = 4/2 \\ \quad \quad \quad y = 2 \end{array} \right\} \begin{array}{l} x + y + 2 \\ (-1) + 2 + (-3) \\ -2 + 2 \\ -2 \end{array} \quad \textcircled{A}$$

$$\textcircled{9} \quad A = (a_{ij}) = 3 \times 2 \quad B = (b_{ij}) = 3 \times 2$$

se $i \neq j, a_{ij} = i + j$ $a_{11} \quad a_{12}$ se $i \neq j, b_{ij} = 0$ $b_{11} \quad b_{12}$
se $i = j, a_{ij} = 1$ $a_{21} \quad a_{22}$ se $i = j, b_{ij} = 2i \cdot j$ $b_{21} \quad b_{22}$
 $a_{31} \quad a_{32}$ $b_{31} \quad b_{32}$

$$\begin{array}{l} a_{11} = 1 \quad a_{12} = 1 + 2 = 3 \\ a_{21} = 2 + 1 = 3 \quad a_{22} = 1 \\ a_{31} = 3 + 1 = 4 \quad a_{32} = 3 + 2 = 5 \end{array} \quad A = \begin{bmatrix} 1 & 3 \\ 3 & 1 \\ 4 & 5 \end{bmatrix} \quad \begin{array}{l} b_{11} = 2 \cdot 1 \cdot 1 = 1 \quad b_{12} = 0 \\ b_{21} = 0 \quad b_{22} = 2 \cdot 2 \cdot 2 = 2 \\ b_{31} = 0 \quad b_{32} = 0 \end{array} \quad B = \begin{bmatrix} 1 & 0 \\ 0 & 2 \\ 0 & 0 \end{bmatrix}$$

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

$$\textcircled{10} \frac{3M}{2} + \frac{2N}{3} = P$$

$$y - x = 7 \quad \textcircled{F}$$

$$\frac{3M}{2} = \begin{bmatrix} \cancel{3x} & 12 \\ 15 & \cancel{3y} \end{bmatrix} + \frac{2N}{3} = \begin{bmatrix} \cancel{2x} & 4 \\ 8 & \cancel{2x+8} \end{bmatrix} = P = \begin{bmatrix} 7 & 16 \\ 23 & 13 \end{bmatrix}$$

$$3x/2 + 2y/3 = 7$$

$$(9x + 4y)/6 = 42/6$$

$$9x + 4y = 42$$

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

$$-5x + 5y = 20$$

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

$$y - x = 20/5$$

$$y - x = 4$$

\textcircled{B}

$$3y/2 + (2x + 8)/3 = 13$$

$$(9y + 4x + 16)/6 = 78/6$$

$$9y + 4x + 16 = 78$$

$\textcircled{2}$

\textcircled{P}