Matrizes

AULA 01

1.

$$A = \begin{vmatrix} A_{11} & A_{12} \\ A_{21} & A_{22} \\ A_{31} & A_{32} \end{vmatrix}_{3\times 2}$$

$A_{11} = 2.1 + 3.1 = 5$

$A_{12} = 2.1 + 3.2 = 8$

$A_{21} = 2.2 + 3.1 = 7$

$A_{22} = 2.2 + 3.2 = 10$

$A_{31} = 2.3 + 3.1 = 9$

$A_{32} = 2.3 + 3.2 = 12$

$$A = \begin{vmatrix} 5 & 8 \\ 7 & 10 \\ 9 & 12 \end{vmatrix}_{2\times 3} \qquad A^t = \begin{vmatrix} 5 & 7 & 9 \\ 8 & 10 & 12 \end{vmatrix}_{3\times 2}$$

2.

$$A = \begin{vmatrix} A_{11} & A_{12} \\ A_{21} & A_{22} \end{vmatrix}$$

$A_{11} = 1^2 + 4.1^2 = 5$

$A_{12} = 1^2 + 4.2^2 = 17$

$A_{21} = 2^2 + 4.1^2 = 8$

$A_{22} = 2^2 + 4.2^2 = 20$

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

(A)

3.

$$A = \begin{vmatrix} 1 & x+2 \\ y-1 & z+1 \end{vmatrix} = \begin{vmatrix} 1 & -x \\ 2y & -2z \end{vmatrix}$$

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

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

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

$x = \frac{-2}{2}$ $\quad$ $y = \frac{1}{-1}$ $\quad$ $z = \frac{1}{3}$

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

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

4.

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

$$\begin{cases} -x = y \\ 3x + 2x + 1 \\ x + z + 1 \end{cases} \qquad \begin{cases} -x = y \\ -3x + 2x + 1 \end{cases} \qquad x = 1 \quad y = -1 \quad z = 2$$

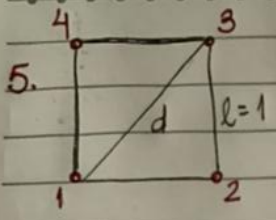
(A) $\begin{cases} -x - y = 0 \\ x = 1 \end{cases}$

$y = -1$

$1 + z - 1$

$z = 2$

5.



$d^2 = \ell^2 + \ell^2$

$d^2 = 2\ell^2$

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

(B)

$A = 4 \times 4$

$A_{11}=0 \quad A_{12}=1 \quad A_{13}=\sqrt{2} \quad A_{14}=1$

$A_{21}=1 \quad A_{22}=0 \quad A_{23}=1 \quad A_{24}=\sqrt{2}$

$A_{31}=\sqrt{2} \quad A_{32}=1 \quad A_{33}=0 \quad A_{34}=1$

$A_{41}=1 \quad A_{42}=\sqrt{2} \quad A_{43}=1 \quad A_{44}=0$

(E)

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

6.

$A = [-1 \ 2 \ 3]$

$B = [0 \ -2 \ 1]$

(D)

$2.A = [-2 \ 4 \ 6]$

$2.A - B = [-2 \ 6 \ 5]$

7.

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

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

(B)

M

8.

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

(A)

$x = -1$

$2y = 4$

$y = 4 - 2$

$y = 2$

$z - 1 = 3$

$z = 3 + 1$

$z = 4$

$x + y + z = 5$

(E)

10.

$$\frac{3M}{2} = \begin{bmatrix} 3x & 12 \\ 2 & 3y \\ 15 & 2 \end{bmatrix} \qquad \frac{2N}{3} = \begin{bmatrix} 2y & 4 \\ 3 & 2(x+4) \\ 8 & 3 \end{bmatrix}$$

$$P = \begin{bmatrix} 7 & 16 \\ 23 & 13 \end{bmatrix}$$

$$\frac{3x}{2} + \frac{2y}{3} = 7 \qquad \frac{3y}{2} + \frac{2(x+4)}{3} \quad \text{II}$$

$$9x + 4y = 42 \quad \text{I} \qquad 9y + 4x + 16 = 78$$

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

$$5y - 5x = 20$$

(B)

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

$$y - x = 4$$