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Turma: CTII 348

01. $A = (a_{ij})_{3\times2}$ $\quad a_{ij} = 2i + 3j$

$a_{11} = 2\cdot1 + 3\cdot1 = 5$
$a_{12} = 2\cdot1 + 3\cdot2 = 8$
$a_{21} = 2\cdot2 + 3\cdot1 = 7$
$a_{22} = 2\cdot2 + 3\cdot2 = 10$
$a_{31} = 2\cdot3 + 3\cdot1 = 9$
$a_{32} = 2\cdot3 + 3\cdot2 = 12$

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

02. $A = (a_{ij})_{2\times2}$ $\quad a_{ij} = i^2 + 4j^2$

$a_{11} = 1^2 + 4\cdot1^2 = 5$
$a_{12} = 1^2 + 4\cdot2^2 = 17$
$a_{21} = 2^2 + 4\cdot1^2 = 8$
$a_{22} = 2^2 + 4\cdot2^2 = 20$

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

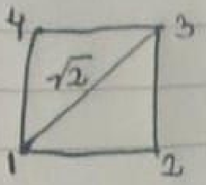
03. $X + 2 = -X \rightarrow 2X = -2 \rightarrow X = -1$
$2y = y - 1 \rightarrow y = -1$
$Z + 1 = -2Z \rightarrow 3Z = -1 \rightarrow Z = -1/3$

$X = -1$
$y = -1$
$Z = \frac{-1}{3}$

04. $3X = 2X + 1 \rightarrow X = 1$
$y = -X \rightarrow y = -1$
$X = -2Z \rightarrow 2Z = -X \rightarrow 2Z = -1 \rightarrow Z = \frac{-1}{2}$

$X = 1$
$y = -1$
$Z = \frac{-1}{2}$

05.



Para chegarmos a resposta exata a matriz deve ser definida pela seguinte lei:

$a_{ij} = 0$ se $i = j$ { $a_{ij} = 1$ se $i - j = 1$ ou -1

$a_{ij} = \sqrt{2}$ se $i - j = 2$ ou -2

Assim chegamos na alternativa (B) $\begin{bmatrix} 0 & 1 & \sqrt{2} & 1 \\ 1 & 0 & 1 & \sqrt{2} \\ \sqrt{2} & 1 & 0 & 1 \\ 1 & \sqrt{2} & 1 & 0 \end{bmatrix}$

06.

$$2A = \begin{bmatrix} -2 \\ 4 \\ 6 \end{bmatrix} - B = \begin{bmatrix} 0 \\ -2 \\ 1 \end{bmatrix} \rightarrow 2A - B = \begin{bmatrix} -2 \\ 6 \\ 5 \end{bmatrix} \text{ (D)}$$

07.

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

08.

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

$x = -1$

$2y = 4 \rightarrow y = 2$

$-z = 3 \rightarrow z = -3$

$2 - 1 - 3 \rightarrow 2 - 4 = -2$

(A) -2

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

Se $i = j$, $a_{ij} = 1$

Se $i \neq j$, $a_{ij} = i + j$

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

Se $i = j$, $b_{ij} = 2i - j$

Se $i \neq j$, $b_{ij} = 0$

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

10. $$\begin{bmatrix} \frac{3x}{2} & 12 \\ 15 & \frac{3y}{2} \end{bmatrix} + \begin{bmatrix} \frac{2y}{3} & 4 \\ 8 & \frac{2(x+4)}{3} \end{bmatrix} = \begin{bmatrix} 7 & 16 \\ 23 & 13 \end{bmatrix}$$

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

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

$$\begin{array}{r} - \; 9y + 4x = 62 \\ 4y + 9x = 42 \\ \hline 5y - 5x = 20 \end{array}$$

$$\frac{5y - 5x = 20}{5} \rightarrow y - x = 4 \quad (B)$$