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① $\begin{bmatrix} 5 & 8 \\ 7 & 10 \\ 9 & 12 \end{bmatrix}$

$a_{11} = 2.1 + 3.1 = 5$ $a_{12} = 2.1 + 3.2 = 8$

$a_{21} = 2.2 + 3.1 = 7$ $a_{22} = 2.2 + 3.2 = 10$

$a_{31} = 2.3 + 3.1 = 9$ $a_{32} = 2.3 + 3.2 = 12$

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

02- $\begin{bmatrix} 5 & 17 \\ 8 & 20 \end{bmatrix}$

$a_{11} = 1^2 + 4.1^2 = 5$ $a_{12} = 1^2 + 4.2^2 = 17$

$a_{21} = 2^2 + 4.1^2 = 8$ $a_{22} = 2^2 + 4.2^2 = 20$ (A)

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

03- $1 = 1$

$x + 2 = -x$

$2x = -2$

$x = -2/2$

$x = -1$

$Y - 1 = 2Y$

$Y = -1$

$Z + 1 = -2Z$

$3Z = -1$

$Z = -1/3$

$X = -1$

$Y = -1$

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

04- $3 = 3$

$-X = Y$

$-1 = Y$

$3x = 2x + 1$

$x = 1$

$x = z - 1$

$1 = z - 1$

$2 = z$

$X = 1$

$Y = -1$

$Z = 2$

05-

$1,1 = 0 \quad 2,1 = 1 \quad 3,1 = \sqrt{2} \quad 4,1 = 1$

$1,2 = 1 \quad 2,2 = 0 \quad 3,2 = 1 \quad 4,2 = \sqrt{2}$

$1,3 = \sqrt{2} \quad 2,3 = 1 \quad 3,3 = 0 \quad 4,3 = 1$

$1,4 = 1 \quad 2,4 = \sqrt{2} \quad 3,4 = 1 \quad 4,4 = 0$

a) $\sqrt{2}$

b) 1

c) $\sqrt{2}$

d) 1

$$\begin{pmatrix} 0 & 1 & \sqrt{2} & 1 \\ 1 & 0 & 1 & \sqrt{2} \\ \sqrt{2} & 1 & 0 & 1 \\ 1 & \sqrt{2} & 1 & 0 \end{pmatrix}_{4\times4}$$

(B)

06- $A = \begin{bmatrix} -1 \\ 2 \\ 3 \end{bmatrix}$ e $B = \begin{bmatrix} 0 \\ -2 \\ 1 \end{bmatrix}$ $\quad 2A - B$

$a11 = 2 \cdot (-1) = -2 \quad -2 - 0 = -2$

$a21 = 2 \cdot 2 = 4 \quad 4 - (-2) = 6$

$a31 = 2 \cdot 3 = 6 \quad 6 - 1 = 5$

$\begin{bmatrix} -2 \\ 6 \\ 5 \end{bmatrix}$ (D)

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

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

$2 - 2 = 0 \quad 5 - 2 = 3$

$3 - 3 = 0 \quad 6 - 1 = 5$

$\begin{bmatrix} 2 & 0 \\ 0 & 4 \\ 3 & 5 \end{bmatrix}$ (B)

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

$2 = 2 \quad -1 = x \quad 2y = 4 \quad x = -1 \quad 0 = 0 \quad -z = 3 \quad 4 = 2y \quad z = -3$

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

$2 = 2$

$x + y + z = (-1) + 2 + (-3) = -2$

(A)

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

$i \neq j \Rightarrow i+j \Rightarrow b_{ij}=0$

$i=j \Rightarrow a_{ij}=1 \Rightarrow b_{ij}=2i-j$

10- $M=\begin{bmatrix}x&8\\10&y\end{bmatrix}$ $N=\begin{bmatrix}y&6\\12&x+4\end{bmatrix}$ $P=\begin{bmatrix}7&16\\28&18\end{bmatrix}$

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

$\frac{3}{2}x+\frac{2}{3}y=7$ $\quad \frac{3}{2}y+\frac{2}{3}(x+4)=13$

$9x+4y=42$ $\quad 3y+2x+8=13$

$9x+4y=42$ $\quad 9y+4x+16=78$

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

$9y-4y+4x-9x=36-16$

$5y-5x=20$

$5(y-x)=20$

$y-x=4$ (B)