

10.  $M = \begin{bmatrix} x & 8 \\ 10 & y \end{bmatrix}$ ,  $N = \begin{bmatrix} y & 6 \\ 12 & x+4 \end{bmatrix}$  e  $P = \begin{bmatrix} 7 & 16 \\ 23 & 13 \end{bmatrix}$   $\frac{3}{2}M + \frac{2}{3}N = P$

$\frac{3}{2} \cdot \begin{bmatrix} x & 8 \\ 10 & y \end{bmatrix} + \frac{2}{3} \cdot \begin{bmatrix} y & 6 \\ 12 & x+4 \end{bmatrix} = \begin{bmatrix} 7 & 16 \\ 23 & 13 \end{bmatrix}$

$\begin{bmatrix} \frac{3}{2}x & \frac{24}{2} \\ \frac{30}{2} & \frac{2}{2}y \end{bmatrix} + \begin{bmatrix} \frac{2}{3}y & \frac{12}{3} \\ \frac{24}{3} & \frac{2}{3}x + \frac{8}{3} \end{bmatrix} = \begin{bmatrix} 7 & 16 \\ 23 & 13 \end{bmatrix}$

$\frac{3}{2}x + \frac{2}{3}y = 7$   $\frac{30}{2} + \frac{2}{3}x + \frac{8}{3} = 13$   
 $9x + 4y = 42$   $9y + 4x + 16 = 70$   
 $\cancel{9x} + \cancel{4y} = \cancel{42}$   $\cancel{9y} + \cancel{4x} + 16 = 70$   
 $9x + 4y = 7$   $9y + 4x = 70 - 16$   
 $9x + 4y = 7$   $9y + 4x = 54$   
 $9x + 4y = 42$   $9y + 4x - (9x + 4y) = 54 - 42$   
 $9y + 4x = 62$   $9y + 4x - 9x - 4y = 20$   
 $5y - 5x = 20$   $5(y - x) = 20$   
 $5(y - x) = 20$   $y - x = \frac{20}{5}$   
 $y - x = 4$

SÃO DOMINGOS

Resposta: (B)

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

$a_{ij} = i + j (i \neq j) / a_{ij} = 1 (i = j)$   $b_{ij} = 0 (i \neq j) / b_{ij} = 2i \cdot j (i = j)$

$a_{11} = 1$   $a_{22} = 1$   $b_{11} = (2 \cdot 1) - 1 = 1$   $b_{22} = (2 \cdot 2) - 2 = 4$   
 $a_{12} = 1 + 2 = 3$   $a_{31} = 3 + 1 = 4$   $b_{12} = 0$   $b_{31} = 0$   
 $a_{21} = 2 + 1 = 3$   $a_{32} = 3 + 2 = 5$   $b_{21} = 0$   $b_{32} = 0$

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

Resposta: (C)

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

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

$$\begin{aligned} x &= -1 & 2y &= 4 & -z &= 5^{(-1)} & x+y+z \\ y &= \frac{4}{2} & z &= -3 & -1+2+(-3) \\ y &= 2 & & & 1-3 \\ & & & & \boxed{-2} \end{aligned}$$

Resposta: (A)

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$$6. A = \begin{bmatrix} -1 \\ 2 \\ 5 \end{bmatrix} \quad B = \begin{bmatrix} 0 \\ -2 \\ 1 \end{bmatrix} \quad 2A - B = 2 \cdot \begin{bmatrix} -1 \\ 2 \\ 5 \end{bmatrix} - \begin{bmatrix} 0 \\ -2 \\ 1 \end{bmatrix} = \begin{bmatrix} -2 \\ 4 \\ 6 \end{bmatrix}$$

$$\nabla \quad \begin{bmatrix} -2 \\ 4 \\ 6 \end{bmatrix} - \begin{bmatrix} 0 \\ -2 \\ 1 \end{bmatrix} = \begin{bmatrix} -2 \\ 6 \\ 5 \end{bmatrix} \quad \text{Resposta: (D)}$$

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

$$B^t = B = \begin{bmatrix} -1 & 3 & 2 \\ 2 & 0 & 1 \end{bmatrix} \Rightarrow B = \begin{bmatrix} -1 & 2 \\ 3 & 0 \\ 2 & 1 \end{bmatrix}$$

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

$$4. \begin{bmatrix} 3 & -x \\ 5x & x \end{bmatrix} = \begin{bmatrix} 3 & y \\ 1x+1 & z-1 \end{bmatrix}$$

$$\begin{array}{lcl} 3x = 1x+1 & -x = y & x = z-1 \\ 3x - 1x = 1 & y = -11 & 1 = z-1 \\ \underline{1x = 1} & \underline{y = -11} & \underline{z = 1+1} \\ & & \underline{z = 2} \end{array}$$

$$5. \begin{array}{c} 4 \quad 3 \\ \begin{array}{|c|c|} \hline 1 & d \cdot \sqrt{2} \\ \hline \end{array} \\ 1 \quad 2 \end{array} \quad \begin{array}{l} d^2 = 2 \cdot 1^2 \\ d = 1 \quad \sqrt{d} = \sqrt{2 \cdot 1} \\ d = \sqrt{2} \end{array}$$

$$\begin{array}{lclclcl} a_{11} = 1a_1 & a_{12} = 1a_2 & a_{13} = 1a_3 & a_{14} = 1a_4 & a_{21} = 2a_1 \\ a_{11} = 0 & a_{12} = 1 & a_{13} = \sqrt{2} & a_{14} = 1 & a_{21} = 1 \end{array}$$

$$\begin{array}{lclclcl} a_{22} = 2a_2 & a_{23} = 2a_3 & a_{24} = 2a_4 & a_{31} = 3a_1 & a_{32} = 3a_2 \\ a_{22} = 0 & a_{23} = 1 & a_{24} = \sqrt{2} & a_{31} = \sqrt{2} & a_{32} = 1 \end{array}$$

$$\begin{array}{lclclcl} a_{33} = 3a_3 & a_{34} = 3a_4 & a_{41} = 4a_1 & a_{42} = 4a_2 & a_{43} = 4a_3 \\ a_{33} = 0 & a_{34} = 1 & a_{41} = 1 & a_{42} = \sqrt{2} & a_{43} = 1 \end{array}$$

$$\begin{array}{lcl} a_{44} = 4a_4 \\ a_{44} = 0 \end{array} \quad A = \begin{bmatrix} 0 & 1 & \sqrt{2} & 1 \\ 1 & 0 & 1 & \sqrt{2} \\ \sqrt{2} & 1 & 0 & 1 \\ 1 & \sqrt{2} & 1 & 0 \end{bmatrix}$$

Repsok: (B)

$$\begin{array}{lcl} a_{21} = 4 + 4 \cdot 1 & a_{22} = 4 + 4 \cdot 4 \\ a_{21} = 8 & a_{22} = 20 \end{array}$$

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

$$\begin{array}{lcl} x+2 = -x & y-1 = 2y & z+1 = -2z \\ x+2 = -2 & 2y-y = -1 & z+2z = -1 \\ \underline{x = -2} & \underline{y = -1} & \underline{z = -\frac{1}{3}} \\ \underline{x = -1} & & \end{array}$$



### Part de Exercice 1

$$1. A = \begin{bmatrix} 5 & 8 \\ 7 & 10 \\ 9 & 12 \end{bmatrix} \quad \text{with } a_{ij} = 2i + 3j$$

$$a_{11} = 2 \cdot 1 + 3 \cdot 1 \quad a_{12} = 2 \cdot 1 + 3 \cdot 2$$

$$a_{11} = 5 \quad a_{12} = 8$$

$$a_{21} = 2 \cdot 2 + 3 \cdot 1 \quad a_{22} = 2 \cdot 2 + 3 \cdot 2$$

$$a_{21} = 7 \quad a_{22} = 10$$

$$a_{31} = 2 \cdot 3 + 3 \cdot 1 \quad a_{32} = 2 \cdot 3 + 3 \cdot 2$$

$$a_{31} = 9 \quad a_{32} = 12$$

$$2. A = \begin{bmatrix} 5 & 17 \\ 8 & 20 \end{bmatrix}$$

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

$$a_{11} = 1^2 + 4 \cdot 1^2 \quad a_{12} = 1^2 + 4 \cdot 2^2$$

$$a_{11} = 1 + 4 \cdot 1 \quad a_{12} = 1 + 4 \cdot 4$$

$$a_{11} = 5 \quad a_{12} = 17$$

Response: (A)

$$a_{21} = 2^2 + 4 \cdot 1^2 \quad a_{22} = 2^2 + 4 \cdot 2^2$$

$$a_{21} = 4 + 4 \cdot 1 \quad a_{22} = 4 + 4 \cdot 4$$

$$a_{21} = 8 \quad a_{22} = 20$$