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Sala: CTII 317

$$1) A = \begin{bmatrix} x & 1 \\ 5 & 3 \end{bmatrix} \quad B = \begin{bmatrix} 3 & -1 \\ y & 2 \end{bmatrix}$$

$$B = \begin{pmatrix} 3 & -1 \\ y & 2 \end{pmatrix} \quad B^{-1} = \begin{pmatrix} x & 1 \\ 5 & 3 \end{pmatrix}$$

$x = 2 \rightarrow B_{22}$ era a posição inicial.

$y = -5 \rightarrow B_{21}$ é a posição final.

$$x + y = 2 + (-5) \\ -3 \text{ letra C}$$

$$2) A = \begin{vmatrix} 1 & 0 & 1 \\ k & 1 & 3 \\ 1 & k & 3 \end{vmatrix}$$

$$A = 1 \cdot \begin{vmatrix} 1 & 3 \\ k & 3 \end{vmatrix} - 0 \cdot \begin{vmatrix} k & 3 \\ 1 & 3 \end{vmatrix} + 1 \cdot \begin{vmatrix} k & 1 \\ 1 & k \end{vmatrix}$$

$$A = 3 - 3k + 0 + k^2 - 1$$

$$A = 2 - 3k + k^2 \text{ letra C}$$

$$3) A = \begin{pmatrix} 3 & 5 \\ 2 & 4 \end{pmatrix} = 12 - 10 = 2$$

$$A^{-1} = \begin{pmatrix} 4 & -5 \\ -2 & 3 \end{pmatrix} \div 2$$

$$B = \begin{pmatrix} 2 & -\frac{5}{2} \\ -1 & \frac{3}{2} \end{pmatrix} \text{ letra C}$$

$$4) A = \begin{vmatrix} x & 1 & 2 & x & 1 \\ 3 & 1 & 2 & 3 & 1 \\ 10 & 1 & x & 10 & 1 \end{vmatrix}$$

$20 + 2x + 3x = 20 + 5x$

$1 = x^2 + 26 + 20 + 5x$

$x^2 + 20 + 6 = x^2 + 26$

$$\Delta = x^2 - 5x + 6$$

$$\Delta = b^2 - 4 \cdot a \cdot c$$

$$\Delta = (-5)^2 - 4 \cdot 1 \cdot 6$$

$$\Delta = 25 - 24$$

$$\Delta = 1$$

$$x = \frac{-b \pm \sqrt{\Delta}}{2 \cdot a}$$

$$x = \frac{5 \pm \sqrt{1}}{2 \cdot 1}$$

$$x = \frac{5 \pm 1}{2}$$

$$x_1 = \frac{5 + 1}{2} = \frac{6}{2} = 3$$

$$x_2 = \frac{5 - 1}{2} = \frac{4}{2} = 2$$

letra A

5)

$$2 + 2 + 2 = 6 = 2 + 4x$$

$$\begin{array}{ccc|cc} -1 & -1 & 2 & -1 & -1 \\ 2 & 1 & -2 & 2 & 1 = 7 - 6 = 1 \\ 1 & 1 & -1 & 1 & 1 \end{array}$$

$$1 + 2 + 4 = 7x - 26$$

$$\begin{array}{ccc|ccc} -1 & -1 & 2 & 1 & 0 & 0 \\ 2 & 1 & -2 & 0 & 1 & 0 \\ 1 & 1 & -1 & 0 & 0 & 1 \end{array} \quad \begin{array}{l} \rightarrow \text{adiciona-se} \\ \text{linha 2 \& a linha 1} \end{array}$$

$$\begin{array}{ccc|ccc} 1 & 0 & 0 & 1 & 1 & 0 \\ (-1) \cdot 2 & 1 & -2 & 0 & 1 & 0 \\ \underline{+} & 1 & 1 & -1 & 0 & 0 & 1 \end{array}$$

$$\begin{array}{c|ccc|ccc}
 (-2) & 1 & 0 & 0 & 1 & -1 & 0 \\
 \hline
 & 2 & 1 & -2 & 0 & 1 & 0 \\
 \hline
 & -1 & 0 & 1 & 0 & -1 & -1
 \end{array}$$

$$\begin{array}{c|ccc|ccc}
 & 1 & 0 & 0 & 1 & 1 & 0 \\
 \hline
 + & 0 & 1 & -2 & -2 & -1 & 0 \\
 \hline
 \Delta & -1 & 0 & 1 & 0 & -1 & -1
 \end{array}$$

$$\begin{array}{c|ccc|ccc}
 & 1 & 0 & 0 & 1 & 1 & 0 \\
 \hline
 & 0 & 1 & -2 & -2 & -1 & 0 \\
 \hline
 (2) & 0 & 0 & 1 & 1 & 0 & 1
 \end{array}$$

$$\begin{array}{c|ccc|ccc}
 & 1 & 0 & 0 & 1 & 1 & 0 \\
 \hline
 & 0 & 1 & 0 & 0 & -1 & 2 \\
 \hline
 & 0 & 0 & 1 & 1 & 0 & 1
 \end{array}$$

$$\begin{array}{ccc|ccc} -1 & -1 & 2 & & 1 & 1 & 0 \\ 2 & 1 & -2 & + & 0 & -1 & 2 \\ 1 & 1 & -1 & & 1 & 0 & 1 \end{array}$$

$$\begin{array}{ccc|c} 0 & 0 & 2 & \\ 2 & 0 & 0 & \text{letra B} \\ 2 & 1 & 0 & \end{array}$$

$$6) ((XA)^T)^T = B^T \Rightarrow XA = B^T$$

$$XAA^{-1} = B^T A^{-1} \Rightarrow XT = B^T A^{-1}$$

$$X = B^T A^{-1} \text{ letra B}$$

$$7) \begin{vmatrix} 4 & -5 \\ 5 & 6 \end{vmatrix} = 24 - 25 = -1$$

$$A = \begin{vmatrix} 5 & 6 \\ 4 & 5 \end{vmatrix}$$

24

$$\begin{vmatrix} 6 & -5 \\ -5 & 4 \end{vmatrix} \div 1$$

$$\begin{vmatrix} -6 & 5 \\ 5 & -4 \end{vmatrix} \text{ let's } D$$

$$8) A = \begin{pmatrix} 2 & k \\ -2 & 1 \end{pmatrix}$$

$$\det A = 2 - (-2k)$$

$$\det A = 2 + 2k$$

$$\det A = 1$$

$$\det A$$

$$\det A^2 = 1$$

$$\det A = \sqrt{1}$$

$$\det A = \pm 1$$

$$2 + 2k = 1$$

$$2 + 2k = -1$$

$$2k = 1 - 2$$

$$2k = -1 - 2$$

$$k = \frac{-1}{2}$$

$$k = \frac{-3}{2}$$

$$\begin{pmatrix} -1 \\ 2 \end{pmatrix} + \begin{pmatrix} -3 \\ 2 \end{pmatrix} = \frac{-4}{2} = -2$$

detra B

$$i) \text{ a) } (A+B) \cdot (A-B) = A^2 - AB + BA - B^2$$

$$b) (A+B)^2 = (A+B) \cdot (A+B) = A^2 + AB + BA + B^2 =$$

$$A^2 + 2AB + B^2$$

$$AB = BA$$

$$c) \det(-A) = (-1)^2 \cdot \det A = \det A \neq 0$$

$$\det(A)$$

$$\det(-A)$$

$$\det(A) = 1$$

$$\det(A)$$

$$d) \det(AB) = 1$$

$$\det(A) \cdot \det(B) = 1$$

$$\det(B) = \frac{1}{\det A}$$