Tarefa básica

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

$y = -5$ $\quad -3$ (C)

$B = \begin{bmatrix} 3 & -1 \\ y & 2 \end{bmatrix}$ regra da ordem 2

2-) $A = \begin{pmatrix} 1 & 0 & 1 \\ K & 1 & 3 \\ 1 & K & 3 \end{pmatrix} \begin{matrix} 1 \\ K \\ 1 \end{matrix} \begin{matrix} 0 \\ 1 \\ K \end{matrix}$ $\quad 1 + 3K + 0$ $\quad 3 + 0 + K^2$

$\det A = K^2 + 3 - 1 - 3K$

$K^2 - 3K + 2 = 0$

$\Delta = 9 - 4 \cdot 1 \cdot 2$

$\Delta = 1$ (C)

$K = \frac{3 \pm 1}{2}$

$K_1 = 1 \qquad K_2 = 2$

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

$B = A^{-1}$

$B = \begin{bmatrix} 4 & -5 \\ -2 & 3 \end{bmatrix} \div 2 = \begin{bmatrix} 2 & -\frac{5}{2} \\ -1 & \frac{3}{2} \end{bmatrix}$ (C)

4-) $\begin{bmatrix} x & 1 & 2 \\ 3 & 1 & 2 \\ 10 & 1 & x \end{bmatrix} \begin{matrix} x & 1 \\ 3 & 1 \\ 10 & 1 \end{matrix}$ $\quad 20 + 2x + 3x$ $\quad x^2 + 20 + 6$

$\det = x^2 + 26 - 20 - 2x - 3x$

$x^2 - 5x + 6$

$\Delta = 25 - 4 \cdot 1 \cdot 6$

$\Delta = 1$

$x = \frac{5 \pm 1}{2}$ $\quad x \neq 2 \quad e \quad x \neq 3$

$x_1 = 2 \quad x_2 = 3$ (A)

5-) $A = \begin{bmatrix} -1 & -1 & 2 \\ 2 & 1 & -2 \\ 1 & 1 & -1 \end{bmatrix} \begin{matrix} -1 & -1 \\ 2 & 1 \\ 1 & 1 \end{matrix}$ $\quad 2+2+2$ / $1+2+4$

$\det A = 7 - 6$

$\det A = 1$

$A' = \begin{bmatrix} 1 & 0 & 1 \\ -1 & -1 & 0 \\ 0 & -2 & 1 \end{bmatrix} \rightarrow \overline{A} = \begin{bmatrix} 1 & 1 & 0 \\ 0 & -1 & 2 \\ 1 & 0 & 1 \end{bmatrix} \rightarrow A^{-1} = \begin{bmatrix} 1 & 1 & 0 \\ 0 & -1 & 2 \\ 1 & 0 & 1 \end{bmatrix}$

$\begin{matrix} 1 & 0 & 1 \\ 1 & -1 & 0 \\ 0 & 2 & 1 \end{matrix}$

$A + A^{-1} = \begin{bmatrix} 0 & 0 & 2 \\ 2 & 0 & 0 \\ 2 & 1 & 0 \end{bmatrix}$ (B)

6-) $(x \cdot A)^t = B$

$x \cdot A = B^t$

$x = \frac{B^t}{A}$

$x = B^t \cdot \frac{1}{A}$

$x = B^t \cdot A^{-1}$ (B)

7-) $B = \begin{bmatrix} x \\ y \end{bmatrix}$

$A = \begin{bmatrix} 4 & 5 \\ 5 & 6 \end{bmatrix} \begin{bmatrix} 4x + 5y \\ 5x + 6y \end{bmatrix} = C$

$\det A = 24 - 25$

$\det A = -1$

$A^{-1} = \begin{bmatrix} 6 & -5 \\ -5 & 4 \end{bmatrix} \div -1$

$A^{-1} = \begin{bmatrix} -6 & 5 \\ 5 & -4 \end{bmatrix}$

(D)

8) $A = \begin{bmatrix} 2 & K \\ -2 & 1 \end{bmatrix}$

$\det A = 2 + 2K$

$\det A = \det A^{-1}$

$(2+2K) \cdot (2+2K) = 1$

$4K^2 + 8K + 3$

$2 + 2K = \frac{1}{2+2K}$

$K = \frac{-8 \pm 4}{8}$

$\Delta = 64 - 4 \cdot 4 \cdot 3$

$\Delta = 16$

$K_1 = \frac{-1}{2}$ $\quad K_2 = \frac{-3}{2}$

(B)

$\frac{-1}{2} - \frac{3}{2} = \frac{-4}{2} = -2$

9-a) $(A+B) \cdot (A-B)$

$A^2 - AB + BA - B^2$

b) $(A+B)^2 = A^2 + 2AB + B^2$

$A^2 + AB + BA + B^2 = A^2 + 2AB + B^2$

?

Para serem iguais, $AB = BA$

c) $\frac{\det(A)}{\det(-A)} = \frac{\det(A)}{-1 \cdot \det(A)} = \frac{\det(A)}{\det(A)} = 1$ //

Fator comum $\rightarrow (K)^2 \cdot \det A \rightarrow (-1)^2 \cdot \det A$

$1 \cdot \det A$

d) $A^{-1} = B$

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