Beatriz Gonçalves Eleutério (1990 JJX)

1º $\begin{bmatrix} 3 & -1 \\ y & 2 \end{bmatrix} \cdot \begin{bmatrix} x & 1 \\ 5 & 3 \end{bmatrix} = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$

$3x - 5 = 1$

$3 - 5 = 0$

$xy + 10 = 0$

$y + 6 = 1$

$3x = 6$

$x = \frac{6}{3}$

$x = 2$

$y = 1 - 6$

$y = -5$

$x + y = 2 - 5 = -3$

ALTERNATIVA: C

2º

$$\begin{bmatrix} 1 & 0 & 1 \\ k & 1 & 3 \\ 1 & k & 3 \end{bmatrix} \begin{matrix} 1 & 0 \\ k & 1 \\ 1 & k \end{matrix}$$

$1 \cdot 3k \cdot 0 = 3k + 1$

$3 \cdot 0 \cdot k^2 = k^2 + 3$

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

$k^2 - 3k + 2$

$k = \frac{3 \pm \sqrt{1}}{2 \cdot 1}$

$\Delta = 3^2 - 4 \cdot 1 \cdot 2$

$\Delta = 9 - 8$

$\Delta = 1$

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

$k' = \frac{3+1}{2} = \frac{4}{2} = 2$

$k'' = \frac{3-1}{2} = \frac{2}{2} = 1$

ALTERNATIVA: C

3º $\begin{bmatrix} 3 & 5 \\ 2 & 4 \end{bmatrix} \cdot \begin{bmatrix} x & y \\ 1 & b \end{bmatrix} = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$

$3x + 5 \cdot 1 = 1$

$3y + 5b = 0$

$2x + 4 \cdot 1 = 0$

$2y + 4b = 1$

4. $\begin{bmatrix} x & 1 & 2 \\ 3 & 1 & 2 \\ 10 & 1 & x \end{bmatrix}$ $\begin{matrix} x & 1 \\ 3 & 1 \\ 10 & 1 \end{matrix}$

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

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

$\det A = x^2 - 5x + 26 - 20$

$x^2 - 5x + 6$

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

$\Delta = 25 - 24$

$\Delta = 1$

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

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

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

$\frac{5-1}{2} = \frac{4}{2} = \boxed{2}$ ∴

ALTERNATIVA: A

5.

6. A = matriz inversível A => mesma ordem <= B
B = matriz inversível

$B = (A \cdot X)^t \Rightarrow B^t = \frac{X}{A^{-1}} \Rightarrow \boxed{X = B^t \cdot A^{-1}}$

ALTERNATIVA: B

7. $\begin{bmatrix} a & c \\ b & d \end{bmatrix} \cdot \begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} 4x+5y \\ 5x+6y \end{bmatrix}$

$ax + cy = 4x + 5y$ $a = 4$ $c = 5$
$bx + dy = 5x + 6y$ $b = 5$ $d = 6$

$A = \begin{bmatrix} 4 & 5 \\ 5 & 6 \end{bmatrix}$ $a = \begin{bmatrix} -6 & 5 \\ 5 & -4 \end{bmatrix}$ ALTERNATIVA: D

8. $A = \begin{bmatrix} 2 & k \\ -2 & 1 \end{bmatrix}$ $\begin{matrix} -2k \\ 2 \end{matrix}$ $\det A = 2 + 2k$

$2k = -2$

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

$K = -1 - 1$

$\boxed{K = -2}$

$A^{-1} = \begin{bmatrix} -1 & k \\ -2 & -2 \end{bmatrix}$ $\begin{matrix} -2k \\ 2 \end{matrix}$ $\det A^{-1} = 2 + 2k$

$2k = -2 \Rightarrow k = -1$

ALTERNATIVA: B