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$0 + (-1) + 0 = -1$

1. $A = \left|\begin{matrix} 1 & 0 & 0 \\ 0 & 1 & 1 \\ 0 & -1 & 1 \end{matrix}\right| \begin{matrix} 1 & 0 \\ 0 & 1 \\ 0 & -1 \end{matrix}$ $\rightarrow$ $\text{Det } A = 1 - (-1) = 2$

$1 + 0 + 0 = 1$

$B = \left|\begin{matrix} 1 & 0 & 0 & 3 \\ 0 & 1 & -1 & 4 \\ 0 & 0 & 0 & 3 \\ 0 & 1 & 1 & 4 \end{matrix}\right|$ $1 \cdot cof(B_{11})$ [illegible]

$1+1=2$

Par $\rightarrow$ permanece o sinal

$\rightarrow$ escolhida

$1 \cdot cof(B_{11})$ $\quad 0 \cdot cof(B_{21})$ $\quad \cancel{0 \cdot cof(B_{31})}$ $\quad \cancel{0 \cdot cof(B_{41})}$

sempre dá 0

$0 + 3 + 0 = 3$

$\left|\begin{matrix} 1 & -1 & 4 \\ 0 & 0 & 3 \\ 1 & 1 & 4 \end{matrix}\right| \begin{matrix} 1 & -1 \\ 0 & 0 \\ 1 & 1 \end{matrix}$ $\rightarrow 3 \cdot -(-3) = -6$

$0 + (-3) + 0 = -3$

$1 \cdot (-6) = -6$

$a \cdot cof(B_{21})$

$0+0+0=0$

$$\left|\begin{array}{ccc|cc} 0 & 0 & 3 & 0 & 0 \\ 0 & 0 & 3 & 0 & 0 \\ 1 & 1 & 4 & 1 & 1 \end{array}\right| \rightarrow 0-0=0$$

$0+0+0=0$

$1 \cdot cof(B_{11}) + a \cdot cof(B_{21})$

$1 \cdot (-6) + a \cdot 0$

R: -6

2. $A = \begin{vmatrix} x^2 & 0 & x & -\frac{1}{10} \\ 7,5 & 0 & 5 & 2 \\ 10 & 0 & 4 & 2 \\ 1 & 1 & 1 & 1 \end{vmatrix} = 0$

$\quad\quad\quad\quad\;\;\llcorner$ escolhido

1. cof(A_{42})

$-5 + 8x^2 + 15x$

$$\begin{vmatrix} x^2 & x & -\frac{1}{10} \\ 7,5 & 5 & 2 \\ 10 & 4 & 2 \end{vmatrix} \begin{matrix} x^2 & x \\ 7,5 & 5 \\ 10 & 4 \end{matrix} = 0$$

$10x^2 + 20x - 3$

Det. $A = 10x^2 + 20x - 3 - 8x^2 - 15 + 5 = 2x^2 + 5x + 2$

$2x^2 + 5x + 2 = 0$

$\Delta = b^2 - 4ac$

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

$\Delta = 25 - 16$

$\Delta = 9$

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

$x = \frac{-5 \pm 3}{4}$

$x' = \frac{-5 + 3}{4}$ $\quad$ $x'' = \frac{-5 - 3}{4}$

$x' = \frac{-2}{4}^{\div 2} = \frac{-1}{2}$ $\quad$ $x'' = \frac{-8}{4} = -2$

[illegible]

3. $A = \begin{vmatrix} x & 0 & 0 & 3 \\ -1 & x & 0 & 0 \\ 0 & -1 & x & 1 \\ 0 & 0 & -1 & -2 \end{vmatrix}$

↳ escolhido

$x \cdot cof(a_{11})$ [illegible]

$0 - x + 0 = -x$

$\begin{vmatrix} x & 0 & 0 \\ -1 & x & 1 \\ 0 & -1 & -2 \end{vmatrix} \begin{matrix} x & 0 \\ -1 & x \\ 0 & -1 \end{matrix}$ $\rightarrow -2x^2 - (-x) = -2x^2 + x$

$-2x^2 + 0 + 0 = -2x^2$

$x \cdot (2x^2 + x)$

$-2x^3 + x^2$

$-1 . cof(a_{21})$ $2+1=3$ (Ímpar = Inverte o sinal)

$0+0+0=0$

$$\left|\begin{array}{ccc|cc} 0 & 0 & 3 & 0 & 0 \\ -1 & x & 1 & -1 & x \\ 0 & -1 & 2 & 0 & -1 \end{array}\right| \rightarrow 3-0=3$$

$0+0+3=3$

$\downarrow$

-3

$-1.(-3)$

3

$(x . cof(a_{11})) + (-1 . cof(a_{21}))$

$-2x^3+x^2+3$

B = A

4.

$$A = \begin{vmatrix} x & 1 & 0 & 0 & 0 \\ 0 & x & 1 & 0 & 0 \\ 0 & 0 & x & 1 & 0 \\ 0 & 0 & 0 & x & k \\ 0 & 0 & 0 & 1 & x \end{vmatrix} \rightarrow x . cof(A_{11})$$

$\downarrow$ escolhido

$$B = \begin{vmatrix} x & 1 & 0 & 0 \\ 0 & x & 1 & 0 \\ 0 & 0 & x & k \\ 0 & 0 & 1 & x \end{vmatrix} \rightarrow x . cof(B_{11})$$

$\downarrow$ escolhido

$$C = \begin{vmatrix} x & 1 & 0 \\ 0 & x & k \\ 0 & 1 & x \end{vmatrix}$$

$0+K.x+0=K.x$

$$\left|\begin{array}{ccc|cc} x & 1 & 0 & x & 1 \\ 0 & x & k & 0 & x \\ 0 & 1 & x & 0 & 1 \end{array}\right| \rightarrow \text{Det } C = x^3-(K.x) = x^3-xK$$

$x^3+0+0=x^3$

$f(x) = \text{Det}\,A \rightarrow f(-2) = 8$

$x \cdot \text{cof}(A_{33}) \longrightarrow x^5 - x^3 K$

$x \cdot \text{cof}(B_{11}) \rightarrow x^4 - x^2 K$

$x \cdot \text{cof}(C_{33}) = x^3 - x K$

$\text{Det}\,A = x \cdot \text{cof}(A_{33})$

$8 = x^5 - x^3 K$

$8 = (-2)^5 - (-2)^3 K$

$8 = -32 + 8 \cdot K$

$8K = 8 + 32$

$8K = 40$

$K = \frac{40}{8}$

$K = 5$