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Tarefa Básica

1. $A = \begin{vmatrix} 1 & a & 0 \\ 0 & 1 & 1 \\ 0 & -1 & 1 \end{vmatrix}$ ~~0. cof(a_{2,1})~~
~~0. cof(a_{3,1})~~

1. cof(a_{1,1}) $\rightarrow 1 \cdot \begin{vmatrix} 1 & 0 \\ -1 & 1 \end{vmatrix} = 1+1=2$

$B = \begin{vmatrix} 1 & 0 & 0 & 3 \\ a & 1 & -1 & 4 \\ 0 & 0 & 0 & 3 \\ 0 & 1 & 1 & 4 \end{vmatrix}$ $\boxed{\det A = 2}$

1. cof(a_{1,1}) a. cof(a_{2,1}) 0. cof(a_{3,1}) 0. cof(a_{4,1})

1. $\begin{vmatrix} 0 & -3 & 0 \\ 1 & -1 & 4 \\ 1 & 1 & 4 \end{vmatrix} = -3-3=-6$

a. $\begin{vmatrix} 0 & 0 & 3 & 0 & 0 & 0 \\ 0 & 0 & 3 & 0 & 0 & 0 \\ 1 & 1 & 4 & 1 & 1 & 4 \\ 0 & 0 & 0 & 0 & 0 & 0 \end{vmatrix} = 0$ $\boxed{\det B = -6}$

$$2. \left| \begin{array}{ccc|c} & x^2 & 0 & -\frac{1}{10} \\ 7,5 & 0 & 5 & 2 \\ 10 & 0 & 4 & 2 \\ 1 & 1 & 1 & 1 \end{array} \right| = 0$$

$$x \cdot \text{Cof}(a_{13}) \rightarrow x \cdot \left| \begin{array}{ccc|c} 7,5 & 0 & 2 & 7,5 & 0 \\ 10 & 0 & 2 & 10 & 0 \\ 1 & 1 & 1 & 1 & 1 \\ 0 & 0 & 0 & 0 & +20 \end{array} \right| = 20 - 15 = 5$$

$$\Delta x \cdot 5 = 5x$$

$$5 \cdot \text{cof}(a_{23}) \rightarrow 5 \cdot \left| \begin{array}{ccc|c} x^2 & 0 & -\frac{1}{10} & 0 \\ 10 & 0 & 2 & 10 & 0 \\ 1 & 1 & 1 & 1 & 1 \\ 0 & 0 & 0 & 0 & -1 \end{array} \right| = -2x^2 - 1$$

$$\Delta 5 \cdot (-2x^2 - 1) \\ \Delta (-15 \cdot 10x - 5)$$

$$10x + 5$$

$$4 \cdot \text{cof}(a_{33}) \rightarrow 4 \cdot \left| \begin{array}{ccc|c} x^2 & 0 & -\frac{1}{10} & 0 \\ 7,5 & 0 & 2 & 7,5 & 0 \\ 1 & 1 & 1 & 1 & 1 \\ 0 & 0 & 0 & 0 & -0,75 \end{array} \right| = -2x^2 - 0,75$$

$$\Delta 4 \cdot (-2x^2 - 0,75) \\ -8x^2 - 3$$

$$1 \cdot \text{cof}(a_{43}) \rightarrow 1 \cdot \left| \begin{array}{ccc|c} x^2 & 0 & -\frac{1}{10} & 0 \\ 7,5 & 0 & 2 & 7,5 & 0 \\ 10 & 0 & 4 & 10 & 0 \\ 0 & 0 & 0 & 0 & 0 \end{array} \right| = 0$$

$$5x + 10x^2 + 5 - 8x^2 - 3 = 0$$

$$2x^2 + 5x + 2 = 0 \quad a=2 \quad b=5 \quad c=2$$

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

$$\Delta = 25 - 16$$

$$\Delta = 9$$

$$\frac{-5 \pm \sqrt{9}}{2 \cdot 2} = \frac{-5 \pm 3}{4}$$
$$x' = \frac{-2}{4} = -\frac{1}{2}$$
$$x'' = \frac{-8}{4} = -2$$

$$\boxed{x = -2 \text{ ou } x = -\frac{1}{2}}$$

$$3. \begin{vmatrix} x & 0 & 0 & 3 \\ -1 & x & 0 & 0 \\ 0 & -1 & x & 1 \\ 0 & 0 & -1 & -2 \end{vmatrix} \quad \begin{matrix} 0. \text{ cof}(a_{13}) \\ 0. \text{ cof}(a_{23}) \end{matrix}$$

$$x \cdot \text{cof}(a_{13}) \rightarrow x \cdot \begin{vmatrix} 0 & 0 & 0 \\ -1 & x & 0 \\ 0 & 0 & -2 \end{vmatrix} = -2x^2$$
$$\cancel{\begin{vmatrix} x & 0 & 3 \\ -1 & x & 0 \\ 0 & -1 & x \end{vmatrix}}$$
$$\cancel{\begin{vmatrix} 0 & 0 & 0 \\ -1 & x & 0 \\ 0 & 0 & -2 \end{vmatrix}}$$
$$x \cdot (-2x^2) = -2x^3$$

$$-1 \cdot \text{cof}(a_{43}) \rightarrow -1 \cdot \begin{vmatrix} 1 & 0 & 0 \\ -1 & x & 0 \\ x^2 & 0 & 3 \end{vmatrix} = x^2 + 3$$
$$\cancel{\begin{vmatrix} x & 0 & 3 \\ -1 & x & 0 \\ 0 & -1 & x \end{vmatrix}}$$
$$\cancel{\begin{vmatrix} 1 & 0 & 0 \\ -1 & x & 0 \\ x^2 & 0 & 3 \end{vmatrix}}$$
$$\rightarrow (-1) \cdot (-1) \cdot (x^2 + 3) = x^2 + 3$$

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

Alternativa A

$$4. \begin{vmatrix} x & 1 & 0 & 0 & 0 \\ 0 & x & 1 & 0 & 0 \end{vmatrix}$$

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

$$x \cdot \text{cof}(a_{11}) \rightarrow x \cdot \begin{vmatrix} x & 1 & 0 & 0 \\ 0 & x & 1 & 0 \\ 0 & 0 & x & k \\ 0 & 0 & 1 & x \end{vmatrix} =$$

~~$x^4 - kx^2$~~

$$\hookrightarrow x \cdot \text{cof}(a_{22}) \rightarrow x \cdot \begin{vmatrix} x & 1 & 0 & 0 \\ 0 & x & k & 0 \\ 0 & 1 & x & 0 \\ 0 & 0 & 0 & 0 \end{vmatrix} = x^3 - kx$$

~~$x^4 - kx^2$~~

$$\rightarrow x(x^3 - kx) \\ x^4 - kx^2$$

$$f(x) = x^5 - kx^3 \quad f(-2) = 8$$

$$f(-2) = -32 + 8k = 8$$

$$8k = 40$$

$$k = 5$$

Alternativa D