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Tarefa Básica - Cálculo Geral de Determinantes

01.

$$A = \begin{vmatrix} 1 & 0 & 0 & 1 & 0 \\ 0 & 1 & 1 & 0 & 1 \\ 0 & -1 & 1 & 0 & -1 \\ 1 & 0 & 0 & 0 & 1 \end{vmatrix} \quad \det A = 1 - (-1) = 2$$

$$B = \begin{vmatrix} 1 & 0 & 0 & 3 \\ 0 & 1 & -1 & 4 \\ 0 & 0 & 0 & 3 \\ 0 & 1 & 1 & 4 \end{vmatrix} \quad \begin{array}{l} \text{Par} \\ 1. \text{ cof}(a_{11}) = 1 \cdot \\ 1 \cdot (-3 - 3) = -6 \end{array}$$

$$a. \text{ cof}(a_{11}) = a. \begin{vmatrix} 0 & 0 & 3 & 0 & 0 \\ 0 & 0 & 3 & 0 & 0 \\ 1 & 1 & 4 & 1 & 1 \\ 0 & 0 & 0 & 0 & 0 \end{vmatrix} \quad \begin{array}{l} a \cdot 0 = 0 \\ 0 - 6 = -6 \end{array}$$

02.

$$\begin{vmatrix} x^2 & 0 & x & -1/10 \\ 7.5 & 0 & 5 & 2 \\ 10 & 0 & 4 & 2 \\ 1 & 1 & 1 & 1 \end{vmatrix} = 0$$

$$\begin{array}{l} \text{Par} \\ 1. \text{ cof}(a_{42}) \\ 1. \begin{vmatrix} x^2 & x & -1/10 & x^2 & x \\ 7.5 & 5 & 2 & 7.5 & 5 \\ 10 & 4 & 2 & 10 & 4 \end{vmatrix} \end{array}$$

$$\det = 10x^2 + 20x - 3 - (8x^2 + 15x - 5)$$

$$\det = 10x^2 + 20x - 3 - 8x^2 - 15x + 5$$

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

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

$$\Delta = 25 - 16$$

$$\Delta = 9$$

$$x = \frac{-5 \pm \sqrt{9}}{2 \cdot 2} = \frac{-5 \pm 3}{4} = \begin{array}{l} x_1 = -1/2 \\ x_2 = -2 \end{array}$$

03.

$$A = \begin{vmatrix} x & 0 & 0 & 3 \\ -1 & x & 0 & 0 \\ 0 & -1 & x & 1 \\ 0 & 0 & -1 & -2 \end{vmatrix} \quad \text{Par} \quad x \cdot \text{cof}(a_{11})$$

$$\begin{vmatrix} x & 0 & 0 & 0 \\ -1 & x & 1 & -1 \\ 0 & -1 & x & 0 \\ 0 & -1 & -2 & 0 \end{vmatrix} \quad \begin{vmatrix} x & 0 & 0 & 0 \\ -1 & x & 1 & -1 \\ 0 & -1 & x & 0 \\ 0 & -1 & -2 & 0 \end{vmatrix} \quad \begin{vmatrix} x & 0 & 0 & 0 \\ -1 & x & 1 & -1 \\ 0 & -1 & x & 0 \\ 0 & -1 & -2 & 0 \end{vmatrix}$$

$$-2x^2 \cdot 0 \cdot 0 = -2x^2$$

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

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

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

$$-1 \cdot \text{cof}(a_{21}) \quad \text{Impar}$$

$$-1 \cdot \begin{vmatrix} 0 & 0 & 3 & 0 \\ -1 & x & 1 & -1 \\ 0 & -1 & -2 & 0 \\ 0 & 0 & 0 & 3 \end{vmatrix} \quad -1 \cdot (-3) = 3$$

$$\det = 3$$

$$\det A = -2x^3 + x^2 + 3 \rightarrow \text{Letra A}$$

04.

$$A = \begin{vmatrix} x & 1 & 0 & 0 & 0 \\ 0 & x & 1 & 0 & 0 \\ 0 & 0 & x & 1 & 0 \\ 0 & 0 & 0 & x & K \\ 0 & 0 & 0 & 1 & x \end{vmatrix} \quad f(x) = \det A$$

$$f(-2) = 8$$

$$\begin{vmatrix} -2 & 1 & 0 & 0 & 0 \\ 0 & -2 & 1 & 0 & 0 \\ 0 & 0 & -2 & 1 & 0 \\ 0 & 0 & 0 & -2 & K \\ 0 & 0 & 0 & 1 & -2 \end{vmatrix} \quad \text{Par} \quad -2 \cdot \text{cof}(a_{11})$$

$$= 8 \quad \begin{vmatrix} -2 & 1 & 0 & 0 \\ 0 & -2 & 1 & 0 \\ 0 & 0 & -2 & K \\ 0 & 0 & 1 & -2 \end{vmatrix}$$

04. continuação

$$-2 \cdot \begin{bmatrix} -2 & 1 & 0 & 0 \\ 0 & -2 & 1 & 0 \\ 0 & 0 & -2 & K \\ 0 & 0 & 1 & -2 \end{bmatrix} = \begin{bmatrix} -2 & 1 & 0 & 0 \\ 0 & -2 & 1 & 0 \\ 0 & 0 & -2 & K \\ 0 & 0 & 1 & -2 \end{bmatrix}$$

-2. coef (a₁₁)

-2K

0 = -2K

-8 0 0 = -8

$$-2 \cdot (-8 - (-2K)) \quad -2 \cdot (16 - 4K)$$

$$-2 \cdot (-8 + 2K) \quad -32 + 8K = 8$$

$$16 - 4K = 8 \quad 8K = 8 + 32$$

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

$$\text{Letra D ou } K = 5$$