

## Exercícios Tarefa básica - Determinantes de Matrizes - ordem 1, 2, 3

$$01. a) \begin{vmatrix} 2 & 3 \\ 1 & 5 \end{vmatrix} = 10 - 3 = 7 //$$

$$b) \begin{vmatrix} -2 & -4 \\ 3 & 6 \end{vmatrix} = 12 - 12 = 0 //$$

$$c) \begin{vmatrix} 3 & -1 & 1 \\ 2 & 1 & -1 \\ 1 & 4 & -2 \end{vmatrix} = 3(-1)(-2) + (-1)(-2)(1) + 1(4)(1) - 3(1)(-2) - (-1)(-2)(1) - 1(4)(1) = 6 + 2 + 4 - 6 - 2 - 4 = 0 //$$

$$d) \begin{vmatrix} 3 & 2 & -1 \\ 2 & 3 & 1 \\ 1 & 1 & 4 \end{vmatrix} = 3(12 - 1) - 2(8 - 4) - 1(8 - 3) = 3(11) - 2(4) - 1(5) = 33 - 8 - 5 = 20 //$$

$$02. A = (a_{ij})$$

$$a_{ij} = \begin{cases} -3, & \text{se } i=j \\ 0, & \text{se } i \neq j \end{cases}$$

$$A = \begin{bmatrix} -3 & 0 & 0 \\ 0 & -3 & 0 \\ 0 & 0 & -3 \end{bmatrix} = -27 //$$

$$\begin{aligned} i=j &= -3 \\ 11 &= -3 \\ 22 &= -3 \\ 33 &= -3 \end{aligned}$$

$$03. \begin{vmatrix} x & 1 & x \\ 3 & x & 4 \\ 1 & 3 & 3 \end{vmatrix} = -3$$

$$\begin{vmatrix} x & 1 & x \\ 3 & x & 4 \\ 1 & 3 & 3 \end{vmatrix} = x^2 - 12x + 9$$

$$3x^2 + 4 + 9x - x^2 + 12x + 9 = -3 \quad x = \frac{-(-3) \pm \sqrt{25}}{2 \cdot 2}$$

$$2x^2 - 5 - 3x = -3$$

$$2x^2 - 5 - 3x - 3 = 0$$

$$2x^2 - 3x - 8 = 0$$

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

$$S = \left\{ -\frac{1}{2}, 2 \right\} //$$

$$a = 2 \quad \Delta = (-3)^2 - 4 \cdot 2 \cdot (-2)$$

$$b = -3 \quad \Delta = 9 + 16$$

$$c = -2 \quad \Delta = 25$$

$$x_1 = \frac{3+5}{2} = 2$$

$$x_2 = \frac{3-5}{2} = -1$$

$$R: E //$$

04. Soma das raízes

$$2(x+1) \cdot x - 1 - x - 1$$

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

$$(x-1)(x+1)(x+1) + 2 = 0$$

$$(x-1)(x+1)(x+1) + 2 - (x-1) = 2$$

$$(x^2-1)(x+1) - x + 1 + 2 - 2 = 0$$

$$x^3 + x^2 - x - 1 - x + 1 = 0$$

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

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

$$a=1 \quad \Delta = 1^2 - 4 \cdot 1 \cdot (-2) \quad x = \frac{-1 \pm \sqrt{9}}{2 \cdot 1}$$

$$b=1 \quad \Delta = 1 + 8$$

$$c=-2 \quad \Delta = 9$$

$$x_1 = \frac{-1 + 3}{2} = 1$$

$$\text{Soma} = 1 + (-2) = -1 \quad x_2 = \frac{-1 - 3}{2} = -2$$

R.C.

05.  $A = (a_{ij})_{3 \times 2}$   $a_{ij} = 2i - 3j$   $B = (b_{jk})_{2 \times 3}$   $b_{jk} = k - j$   $A \cdot B = ?$

$$2i - 3j$$

$$a_{11} = 2 \cdot 1 - 3 \cdot 1 = -1$$

$$a_{12} = 2 \cdot 1 - 3 \cdot 2 = -4$$

$$a_{21} = 2 \cdot 2 - 3 \cdot 1 = 1$$

$$a_{22} = 2 \cdot 2 - 3 \cdot 2 = -2$$

$$a_{31} = 2 \cdot 3 - 3 \cdot 1 = 3$$

$$a_{32} = 2 \cdot 3 - 3 \cdot 2 = 0$$

$$A = \begin{bmatrix} -1 & -4 \\ 1 & -2 \\ 3 & 0 \end{bmatrix}$$

$$3 \times 2$$

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

$$a_{11} = 1 - 1 = 0$$

$$a_{12} = 2 - 1 = 1$$

$$a_{13} = 3 - 1 = 2$$

$$a_{21} = 1 - 2 = -1$$

$$a_{22} = 2 - 2 = 0$$

$$a_{23} = 3 - 2 = 1$$

$$A \cdot B = \begin{bmatrix} -1 & -4 \\ 1 & -2 \\ 3 & 0 \end{bmatrix} \cdot \begin{bmatrix} 0 & 1 & 2 \\ -1 & 0 & 1 \end{bmatrix}$$

$$AB = \begin{bmatrix} 4 & -1 & -6 \\ 2 & 1 & 0 \\ 0 & 3 & 6 \end{bmatrix} \quad \begin{array}{l} 0+4 \quad -1+0 \quad -2-4 \\ 0+2 \quad 1+0 \quad 2-2 \\ 0+0 \quad 3+0 \quad 6+0 \end{array}$$

$$\rightarrow \begin{bmatrix} 4 & -1 & -6 \\ 2 & 1 & 0 \\ 0 & 3 & 6 \end{bmatrix} \begin{array}{l} 0 \quad 0 \quad -12 = -12 \\ 4 \quad -1 \\ 2 \quad 1 \\ 0 \quad 3 \end{array} \quad \begin{array}{l} \\ \\ -12 - (-12) = -12 + 12 = 0 // \\ 24 \quad 0 \quad -36 = -12 \end{array} \quad R: C //$$

06.

$$A = \begin{bmatrix} 2 & 0 & -1 \\ -1 & 1 & 0 \end{bmatrix}_{2 \times 3} \quad B = \begin{bmatrix} 1 & -1 \\ -1 & 1 \\ 0 & 2 \end{bmatrix}_{3 \times 2}$$

$$\begin{array}{l} 2+0+0 \quad -2+0+-2 \\ -1-1+0 \quad +1+1+0 \end{array}$$

$$A \cdot B = \begin{bmatrix} 2 & -4 \\ -2 & 2 \end{bmatrix}_{2 \times 2} \quad \begin{array}{l} 8 \\ 4-8 = -4 // \\ 4 \end{array} \quad R: D //$$