

# Determinantes - Matriz Orden 1, 2, 3 - T Barja

01 - Clculo de determinante das seguintes matrizes:

a) 
$$\begin{bmatrix} 2 & 3 \\ 1 & 5 \end{bmatrix} \xrightarrow{\text{principal}} \text{Det a} = 2 \cdot 5 - 3 \cdot 1 = 7$$

b) 
$$\begin{bmatrix} -2 & -4 \\ -3 & 6 \end{bmatrix} \xrightarrow{\text{}} \text{Det b} = -2 \cdot 6 - (-4 \cdot 3) = 04 - (-4) = 4$$

c) 
$$\begin{bmatrix} 3 & -1 & 1 \\ 2 & 1 & -1 \\ 1 & 4 & -2 \end{bmatrix} \xrightarrow{\text{R. Soma}} \text{Det c} = 3 - (-7) = 10$$

$$\begin{array}{r} \begin{array}{ccc|cc} 3 & -1 & 1 & 3 & -1 \\ 2 & 1 & -1 & 2 & 1 \\ 1 & 4 & -2 & 1 & 4 \end{array} \\ \hline \begin{array}{cc} 1 - 12 + 4 & -6 + 1 + 8 \\ -7 & 3 \end{array} \end{array} \quad \text{Det c} =$$

d) 
$$\begin{bmatrix} 3 & 2 & 1 & 3 & 2 \\ 2 & 3 & 1 & 2 & 3 \\ 1 & 1 & 4 & 1 & 1 \end{bmatrix} \quad \begin{array}{l} 36 + 2 - 2 = 36 \\ -3 + 3 - 16 = 16 \end{array}$$

$$\text{Det d} = 36 - 16 = 20$$

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

$a_{11} = \begin{cases} -3, & \text{se } i = 1, \\ 0, & \text{se } i \neq 1 \end{cases}$ , então determinante  $A$  vale:

$$a_{11} = -3$$

$$a_{12} = 0$$

$$a_{13} = 0$$

$$a_{21} = 0$$

$$a_{22} = -3$$

$$a_{23} = 0$$

$$a_{31} = 0$$

$$a_{32} = 0$$

$$a_{33} = +3$$

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

$$\text{Det } A = -27$$

Resp: A

03.

$$\begin{vmatrix} x & 1 & x \\ 3 & x & 4 \\ 1 & 3 & 2 \end{vmatrix} = -3 \Rightarrow \begin{vmatrix} x & 1 & x & x \\ 3 & x & 4 & 3 \\ 1 & 3 & 2 & 1 \end{vmatrix}$$

$$\begin{array}{l} 3x^2 + 4 + 9x - x^2 - 12x - 9 = -3 \\ 2x^2 + 3x - 5 = -3 \\ 2x^2 + 3x - 2 = 0 \end{array} \quad \begin{array}{l} 3x^2 + 4 + 9x \\ -x^2 - 12x - 9 \end{array}$$

$$x_{1,2} = \frac{-(-3) \pm \sqrt{25}}{2} = \frac{3 \pm 5}{2} = \frac{8}{2} = 4 \quad x_1 = \frac{-(-3) + 5}{2} = \frac{8}{2} = 4$$

$$x_{1,2} = \frac{-(-3) \pm 5}{2} = \frac{3 \pm 5}{2} = \frac{8}{2} = 4$$

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

Resp: A

04-

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

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

$$x-1 = 2$$

$$x = 2-1$$

$$x = 1$$

$$x+1+2 = 2$$

$$x+3 = 2$$

$$x = 2-3$$

$$x = -1$$

$$S_1 = 1 + (-1) = -1$$

$$S = \begin{vmatrix} x & x & x \\ x & x & x \\ x & x & x \end{vmatrix}$$

$$R = C$$

5 -  $A = (a_{ij})_{3 \times 2}$ , tal que  $a_{11} = 2i - 3j$  e  $B = (b_{jk})_{2 \times 3}$ .  
tal que  $b_{jk} = k - j$ . determinante  $A \cdot B$  igual a;

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

$$A = \begin{vmatrix} -1 & -4 \\ -5 & -2 \\ -3 & 0 \end{vmatrix}; B = \begin{vmatrix} 0 & 1 & 2 \\ -1 & 0 & 1 \end{vmatrix}$$

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

$$A \cdot B = \begin{vmatrix} 1 & -1 & -6 & 4 & -1 \\ 2 & 1 & 0 & 2 & 1 \\ 0 & 3 & 5 & 0 & 3 \end{vmatrix}$$

~~$$\text{Det } A \cdot B = -12 - (-12)$$~~  
$$\text{Det } A \cdot B = 0$$
  
$$R = C$$

$$(-12) - (+24 - 36) = \boxed{-12}$$

06-

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

Det A, B i' uguali

$$A \cdot b = \begin{bmatrix} 2 & -4 \\ -2 & 2 \end{bmatrix} \quad \begin{aligned} \text{Det } A \cdot B &= 2 \cdot 2 - (-4 \cdot -2) \\ \text{Det } A \cdot B &= 4 - 8 = -4 \\ \text{Det } A \cdot B &= -4 \end{aligned}$$

$$R = D$$