

# Determinantes - Matriz Ordem 1, 2 e 3 - T Barão

01 - Calcule os determinantes das seguintes matrizes:

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

secondary  
principal

b)  $\begin{bmatrix} -2 & -4 \\ 3 & 6 \end{bmatrix}$   $\rightarrow$   $\text{Det b} = -2 \cdot 6 - (-4 \cdot 3) = 0$

c)  $\begin{bmatrix} 3 & -1 & 1 \\ 2 & 1 & -1 \\ 1 & 4 & -2 \end{bmatrix}$   $\rightarrow$  R. Sarrus

$\text{Det c} = 3 - (-7) = 10$

$$\begin{array}{ccccccc} 3 & -1 & 1 & 3 & -1 & 1 & \\ 2 & 1 & -1 & 2 & 1 & -1 & \\ 1 & 4 & -2 & 1 & 4 & -2 & \end{array}$$

$$\underbrace{1 - 12 + 4}_{-7} \quad \underbrace{-6 + 1 + 8}_3$$

d)  $\begin{bmatrix} 3 & 2 & -1 \\ 2 & 3 & 1 \\ 1 & 1 & 4 \end{bmatrix}$   $\begin{bmatrix} 3 & 2 \\ 2 & 3 \\ 1 & 1 \end{bmatrix}$

$36 + 2 - 2 = 36$   
 $-3 + 3 - 16 = -16$

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

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

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

$a_{11} = -3$   
 $a_{12} = 0$   
 $a_{13} = 0$   
 $a_{21} = 0$   
 $a_{22} = -3$   
 $a_{23} = 0$   
 $a_{31} = 0$   
 $a_{32} = 0$   
 $a_{33} = +3$

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

$\text{Det } A = -27$

$\text{Det } A = -27$

Resp: A

03.

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

$3x^2 + 4 + 9x - x^2 - 12x - 9 = -3$   
 $2x^2 + 3x - 5 = -3$   
 $2x^2 + 3x - 2 = 0$

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

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

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

Resp: A

04-

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

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

$$x-1 = 2$$

$$x = 2 + 1$$

$$x = 3$$

$$x+1+2 = 2$$

$$x+3 = 2$$

$$x = 2 - 3$$

$$x = -1$$

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

$$S =$$

$$R = C$$

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

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

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

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

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

~~$$A \cdot B = \begin{bmatrix} 9 & -1 & -6 \\ 2 & 1 & 0 \\ 0 & 3 & 6 \end{bmatrix}$$~~

$$\det A \cdot B = -12 - (-12)$$

$$\det A \cdot B = 0$$

$$R = C$$

$$(-12) - (+24 - 36) = (-12)$$

06-

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

Det A.B é igual:

$$A.B = \begin{bmatrix} 2 & -4 \\ -2 & 2 \end{bmatrix}$$

$$\text{Det } A.B = 2 \cdot 2 - (-4 \cdot -2)$$

$$\text{Det } A.B = 4 - 8 = -4$$

$$\text{Det } A.B = -4$$

$$R = \emptyset$$