

Determinantes - Matriz Orden 1, 2, 3 - Tarea

01 - Calcula los determinantes de las siguientes matrices:

a) $\begin{vmatrix} 2 & 3 \\ 1 & 5 \end{vmatrix}$ secundaria

principal

$$\text{Det } a = 2 \cdot 5 - 3 \cdot 1 = 7$$

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

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

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

$$\begin{array}{ccc|c|c} 3 & -1 & 1 & 3 & -1 \\ 2 & 1 & -1 & 2 & 1 \\ 1 & 4 & -2 & 1 & 4 \end{array}$$

Det c =

$$1 \cdot -12 + 4 \cdot -6 + 1 \cdot 8 \\ = -7 \quad 3$$

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

$$3 \cdot 2 \cdot 2 = 36$$

$$-3 + 3 - 16 = 16$$

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

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

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

$$a_{11} = -3$$

$$a_{12} = 0$$

$$a_{13} = 0$$

$$a_{21} = 0$$

$$a_{22} = -3$$

$$a_{23} = 0$$

$$a_{31} = 0$$

$$a_{32} = 0$$

$$a_{33} = +3$$

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

$$\begin{matrix} (-27) \\ 0 \end{matrix}$$

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

Rsp: A

03 -

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

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

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

$$x_{1,2} = \frac{-(-3) \pm 5}{2} = \frac{8}{2} = 4 \quad x_2 = \frac{-(-3) - 5}{2} = \frac{-2}{2} = -1$$

Rsp: A

04-

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

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

$$x-1=2$$

$$x=2-1$$

$$x=1$$

$$x+1+2=2$$

$$x+3=2$$

$$x=2-3$$

$$x=-1$$

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

$$S_2 = -1 - 1 + 2 = 0$$

$$R = C$$

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;

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

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

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

$$A \cdot B = \begin{vmatrix} 1 & -1 & -6 & 4 & -1 \\ 2 & 1 & 0 & 2 & 1 \\ 0 & 3 & 5 & 0 & 3 \end{vmatrix} \quad \text{Det } A \cdot B = -12 - (-12)$$
$$\text{Det } A \cdot B = 0 \quad R = C$$

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

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 are equal.

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

$$R = D$$