ALGEBRA RETROALIMENTACIÓ N



TOMO 5





PROBLEMA 1

Halle el mayor valor

de X

$$\frac{X+5}{X-5} + \frac{X-5}{X+5} = \frac{5}{2}$$

Resolución

$$\frac{(X+5)^2+(X-5)^2}{(X-5)(X+5)}=\frac{5}{2}$$

$$\frac{2(X^2 + 5^2)}{(X^2 - 25)} \neq \frac{5}{2}$$

$$4(x^2 + 25) = 5(x^2 - 25)$$

$$4x^2 + 100 = 5x^2 - 125$$

$$\rightarrow x_1 = 15$$
 ; $x_2 = -15$

PROBLEMA 2

De la ecuación de raíces

$$x_1; x_2$$

$$3x^2 - 6x + 3 = 0$$

Calcule el valor de R= $(x_1^2 +$

<u>Resolución</u>

$$3x^2 - 6x + 3 = 0$$

a

$$x_1 + x_2 = -\frac{b}{a} = \frac{-(-6)}{3} = 2$$

$$x_1 \cdot x_2 = \frac{c}{a} = \frac{3}{3} = 1$$

$$(x_1 + x_2)^2 = x_1^2 + x_2^2 + 2x_1x_2$$

$$2^2 = x_1^2 + x_2^2 + 2(1)$$

$$2 = x_1^2 + x_2^2$$

$$R = (2)^1$$

Rpta = 2

PROBLEMA 3

Halle el valor de k para que la ecuación

Resolución
$$\frac{x^2+3x}{k-1}$$
; tenga raíces

$$\sin (k-1)(x^2+3x) = (k+1)(5x-2)$$

$$kx^2 + 3kx - x^2 - 3x = 5kx + 5x - 2k - 2$$

$$(k-1)x^2 -2kx -8x +2k +2 = 0$$

$$(k-1)x^2 + (-2k-8)x + (2k+2) = 0$$

recuerda

tiene raices simetricas

$$\Rightarrow b = 0$$

-2k-8=0
$$-8 = 2k$$

$$-4 = k$$



PROBLEMA 4

SI x_1 ; x_2y x_3 son raíces de la ecuación

$$x^3 + 2x^2 - 5x - 6 = 0$$

Resolution
$$P = \frac{x_1}{x_2x_3} + \frac{x_2}{x_1x_3} + \frac{x_2}$$

$$x_1 + x_2 + x_3 = -2$$

•
$$x_1.x_2.x_3 = 6$$

$$x_1 \cdot x_2 + x_2 \cdot x_3 + x_1 \cdot x_{3=-5}$$

Del dato:

$$\mathbf{p} = \frac{x_1 . x_1}{x_1 . x_2 . x_3} + \frac{x_2 . x_2}{x_1 . x_2 . x_3} + \frac{x_3 . x_3}{x_1 . x_2 . x_3}$$

$$\frac{x_3}{x_1x_2} = \frac{x_1^2 + x_2^2 + x_3^2}{x_1 \cdot x_2 \cdot x_3}$$

$$\Rightarrow x_1^2 + x_2^2 + x_3^2 = (x_1 + x_2 + x_3)^2 - 2(x_1 \cdot x_2 + x_2 \cdot x_3 + x_1 \cdot x_3)$$

$$x_1^2 + x_2^2 + x_3^2 = 4 - 2(-5)$$

$$x_1^2 + x_2^2 + x_3^2 = 14$$

Piden:

$$p = \frac{14}{6}$$

$$Rpta = \frac{7}{3}$$

PROBLEMA 5

Sabiendo que m, n, p son las raíces de la ecuación $4x^3 + 5x - 16 = 0$.

Evalué: $R = mn(m+n)^3 + mn(m+p)^3 + np(n+p)^3$

Resolución

$$4x^3 + 0x^2 + 5x - 16 = 0$$

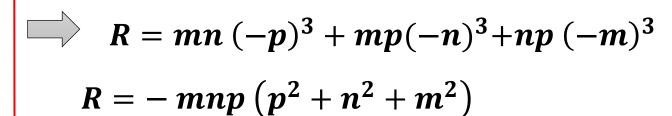
$$m+n+p=0$$

$$m.n.p=4$$

$$m.n+n.p+m.p=\frac{5}{4}$$

$$m^2 + n^2 + p^2 = -2(mn+np+mp)$$

Reemplazando en "R"



$$R = -4(-2)(\frac{5}{4})$$

RPTA: R = 10

PROBLEMA 6

Sea la ecuación polinomial
$$x^3 + 2x^2 + mx + n = 0$$

Resourción es -4 y 3 calcule t = uego:

$$x^{3} + 2x^{2} + mx + n = 0$$
sea

$$x_1$$
=-4; $x_2 = 3$

$$x_1 + x_2 + x_3 = -\frac{2}{1} = -2$$

$$-4 + 3 + x_3 = -2$$

$$x_3 = -1$$

$$x_1.x_2 + x_2.x_3 + x_1.x_3 = m$$

$$(-4)(3) + 3(-1) + (-4)(-1) = m$$

$$-12 - 3 + 4 = m$$

$$-11 = m$$

$$x_1.x_2.x_3 = -n$$
 $(-4)(3)(-1) = -n$
 $-12 = n$

Rpta.33

Piden:
$$t = \frac{m.n}{4}$$

$$t = \frac{132}{4} = 33$$

PROBLEMA 7

Sean las matrices T=
$$\begin{pmatrix} (x-2y) & (w+z) \\ (y-5) & 4z \end{pmatrix}$$
;

$$\begin{pmatrix} -4 & 11 \\ 3 & 8 \end{pmatrix} = R$$
.

Resolution: CALCULE x + y + z + w w + 2 = 11

•
$$y - 5 = 3$$

$$y = 8$$

•
$$4z = 8$$

$$z = 2$$

•
$$X-2(8)=-4$$

$$X - 16 = -4$$

$$x = 12$$

•
$$w+2=11$$

$$w = 9$$

$$x+y+z+w$$

$$= 12 + 8 + 2 + 9$$

$$rpta = 31$$

PROBLEMA 8

Determine

$$x\begin{vmatrix} (X+3) & 4 \\ 5 & -2 \end{vmatrix} +$$

RESOLUCIÓN

$$\begin{vmatrix} (X + 3) & 4 \\ 5 & -2 \end{vmatrix} + \begin{vmatrix} X & 8 \\ 2 & 3 \end{vmatrix} = 5$$

$$-2(x+3)-20+3(x)-2(8)=5$$

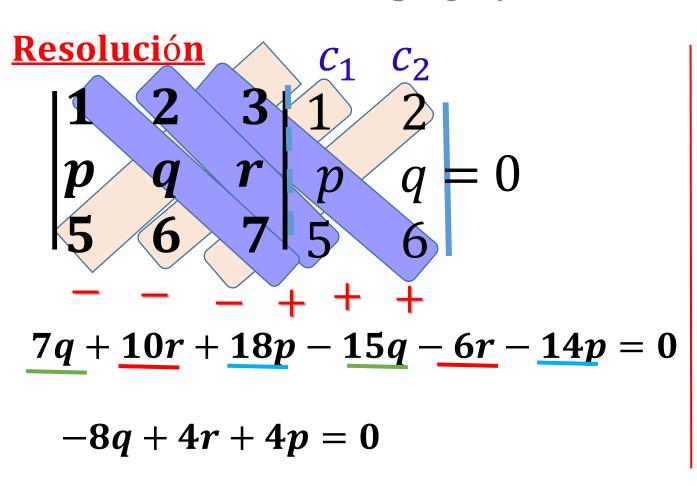
$$-2x - 6 - 20 + 3x - 16 = 5$$

$$x-42=5$$

x = 47

Rpta.47

PROBLEMA 9
REDUZCA M =
$$\frac{20q}{r+p}$$
, $si\begin{vmatrix} 1 & 2 & 3 \\ p & q & r \\ 5 & 6 & 7 \end{vmatrix} = 0$



$$4(r+p) = 8q$$

$$r+p = 2q$$

$$M = \frac{20q}{2q}$$

$$M = 10$$

RPTA:
$$M = 10$$

PROBLEMA 10

Rodrigo le dice a su hijo: "Si calculas el valor de (9x),halla el gasto que realizaré en el mercado"

$$\begin{vmatrix} (1-x) & 1 & -1 \\ 2 & 0 & -2 \\ 1 & 1 & -(1+x) \end{vmatrix} = \begin{vmatrix} x & (x+9) \\ 1 & -2 \end{vmatrix}$$

$$-4 + 2(1 - x) - 2(1 + x) = -3x - 9$$

$$-4 + 2 - 2x - 2 - 2x = -3x - 9$$

$$x = 5$$

$$gasta s / 45$$

Rodrigo gasta 45