



ALGEBRA

Chapter 6 SESION 2

2th
SECONDARY

**POLINOMIOS
ESPECIALES**



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PROBLEMA 1

Si el polinomio es completo y ordenado

$$Q(x) = \overset{\text{grado 0}}{9} - \overset{\text{grado 1}}{3x} + 5x^{\overset{2}{m-2}} + 7x^{\overset{3}{n-3}} + 2x^{\overset{4}{p-1}}, \text{ calcule } m+n+p$$

Resolución

$$* m - 2 = 2$$

$$m = 4$$

$$* n - 3 = 3$$

$$n = 6$$

$$* p - 1 = 4$$

$$p = 5$$

$$m + n + p =$$

$$15$$



PROBLEMA 2

Si el polinomio

$$P(x, y) = 5x^{2m-3}y^2 + 7x^{3n+1}y^5$$

15
15

Es homogéneo de grado 15, calcule: $m+n$

Resolución

$$\begin{aligned}
 * 2m - 3 + 2 &= 15 \\
 2m &= 16 \\
 m &= 8
 \end{aligned}$$

$$\begin{aligned}
 * 3n + 1 + 5 &= 15 \\
 3n &= 9 \\
 n &= 3
 \end{aligned}$$

$$m + n = 11$$



PROBLEMA 3

De la identidad

$$(2x + 5)a + (x + 3)b \equiv 2x + 4$$

Determine $(a - b)^2$ Resolución

$$2ax + 5a + bx + 3b \equiv 2x + 4$$

$$\underline{(2a + b)x} + \underline{(5a + 3b)} \equiv \underline{2x} + \underline{4}$$

$$2a + b = 2 \xrightarrow{\times 3} 6a + 3b = 6$$

$$\xrightarrow{\quad} 5a + 3b = 4$$

$$\underline{\hspace{1.5cm}}$$

$$a = 2$$

$$\text{Reem: } 5(2) + 3b = 4$$

$$\Rightarrow b = -2$$

$$(a - b)^2 = (2 - (-2))^2$$

$$= 16$$



Sabiendo que

$$P(x) = (a + b - 1)x^2 + (b + c + 2)x + (c + a + 4)$$

$Q(x) = 4x^2 + 3x + 2$, además $P(x) \equiv Q(x)$, calcule $a+b+c$

Resolución

$$\underline{(a + b - 1)}x^2 + \underline{(b + c + 2)}x + \underline{(c + a + 4)} \equiv \underline{4}x^2 + \underline{3}x + \underline{2}$$

*igualando los
coeficientes*

$$\left\{ \begin{array}{l} a + b - 1 = 4 \\ b + c + 2 = 3 \\ c + a + 4 = 2 \end{array} \right.$$

*Sumando las
ecuaciones*

$$2a + 2b + 2c + 5 = 9$$

$$a + b + c = 2$$



PROBLEMA 5

Si el polinomio

$$P(x, y) = mx^{m-2}y^{n+3} + 2nx^{m-1}y^{n+2} + mx^6y^4$$

Es homogéneo, indique la suma de sus coeficientes

Resolución

$$P(x, y) = mx^{m-2}y^{n+3} + 2nx^{m-1}y^{n+2} + mx^6y^4$$

Diagram illustrating the degrees of each term in the polynomial $P(x, y)$ to determine homogeneity. Red dotted circles group the terms, and red text above indicates their total degrees: $m+n+1$ for the first two terms and 10 for the third term.

Por ser homogéneo:

$$m + n + 1 = 10$$

$$\Rightarrow m + n = 9$$

Piden: la suma de coeficiente

$$\Rightarrow m + 2n + m$$

$$2(m + n) = 2(9)$$

$$= 18$$



Julio debe a Mario el doble del valor de $(p+m-n)$, en soles.
Sabiendo que

$$P(x) = 3x^{m+n+5} + 2x^{n+8} + 5x^{p+6}$$

Es completo y ordenado de manera descendente, ¿Cuánto le debe Julio a Mario?

Resolucion

$$P(x) = 3x^{\overbrace{m+n+5}^2} + 2x^{\overbrace{n+8}^1} + 5x^{\overbrace{p+6}^0}$$

menor

$$p + 6 = 0$$

$$n + 8 = 1$$

$$m + n + 5 = 2$$

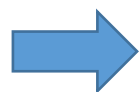
$$m - 7 + 5 = 2$$

Piden:

$$(p + m - n) = 5$$

Julio le debe a Mario

5 soles



$$p = -6$$



$$n = -7$$



$$m = 4$$



Si se cumple: $6x + 12 \equiv M(x + 1) + N(x + 4)$
Evalúe $2M - 3N$

Resolucion

$$6x + 12 \equiv M(x + 1) + N(x + 4)$$

$$6x + 12 \equiv Mx + M + Nx + 4N$$

$$\underline{6x} + \underline{12} \equiv \underline{(M + N)x} + \underline{(M + 4N)}$$



$$12 = \cancel{M} + 4N$$

$$6 = \cancel{M} + N$$



$$6 = 3N \quad \rightarrow \quad N = 2 \quad M = 4$$

Piden:

$$2M - 3N = 2(4) - 3(2)$$

$$= 2$$



Si el polinomio

$$P(x) = (m + n - 2)x^3 + (n + p - 3)x^2 + (m + p - 1)x$$

Es idénticamente nulo, calcule: $T = \sqrt{3(m + n + p)^3}$

Resolucion

$$P(x) = \underline{(m + n - 2)x^3} + \underline{(n + p - 3)x^2} + \underline{(m + p - 1)x}$$

$$* m+n-2=0$$

$$* n+p-3=0$$

$$* m+p-1=0$$

$$\text{Luego } \left\{ \begin{array}{l} m+n=2 \\ n+p=3 \\ m+p=1 \end{array} \right.$$

$$\text{Luego } \left\{ \begin{array}{l} n+p=3 \\ m+p=1 \end{array} \right.$$

$$\text{Luego } \underline{m+p=1}$$

$$2m + 2n + 2p = 6$$

+



$$m+n+p=3$$

$$T = \sqrt{3(m+n+p)^3}$$

$$T = \sqrt{81}$$

$$T = 9$$