

ALGEBRA

2th
Session II



HELICO
ASESORÍA

Tomo 2

 **SACO OLIVEROS**



1. Reduce

$$H = \frac{(x^4 \cdot x^{(-3)^2} \cdot x^{-(-1)^{2020}})^5}{x^{4^3} \cdot x^{(-3)^2}}$$

RESOLUCIÓN

$$H = \frac{(x^4 \cdot x^9 \cdot x^{-1})^5}{x^{64} \cdot x^9} = \frac{(x^{12})^5}{x^{73}} = \frac{x^{60}}{x^{73}}$$



$$x^{-13}$$



2. Reduce $A = 125^{3^{-1}} + \left(\frac{16}{25}\right)^{2^{-1}} - \sqrt{\sqrt{\sqrt{\frac{256}{5^8}}}}$

RESOLUCIÓN

$$A = 125^{1/3} + \left(\frac{16}{25}\right)^{1/2} - \sqrt[8]{\frac{2^8}{5^8}}$$

$$A = 5 + \frac{4}{5} - \frac{2}{5} = 5 + \frac{2}{5} \rightarrow \boxed{27/5}$$



3. Halle el valor de x, en

$$8^{2x-1} \cdot 32^{x-4} = 16^{6x} \cdot 4^{x-3}$$

RESOLUCIÓN

$$(2^3)^{2x-1} \cdot (2^5)^{x-4} = (2^4)^{6x} \cdot (2^2)^{x-3}$$

$$2^{6x-3} \cdot 2^{5x-20} = 2^{24x} \cdot 2^{2x-6}$$

$$2^{11x-23} = 2^{26x-6}$$

$$11x - 23 = 26x - 6 \quad \Rightarrow \quad -17 = 15x$$

$$\Rightarrow \quad -17/15 = x$$



4. Si $P(x - 1) = 27x^{20} - 9x^{21} - x - 20$
Evalúe $P(2)$

RESOLUCIÓN

$$x - 1 = 2$$

$$x = 3$$



$$P(2) = (3)^3(3)^{20} - 3^2 \cdot (3)^{21} - (3) - 20$$

$$P(2) = (3)^{23} - (3)^{23} - 3 - 20$$

$$P(2) = -23$$



5. Si $R(x) = 12n^2(x^5 - 2x^7)^2(x^3 - 3x^7)^4(x^2 + x)^{12}$ tiene como grado absoluto $(3n - 6)$. Halle el valor de n .

RESOLUCIÓN

$$R(x) = 12n^2 \overbrace{(x^5 - 2x^7)^2}^{7 \times 2 = 14} \overbrace{(x^3 - 3x^7)^4}^{7 \times 4 = 28} \overbrace{(x^2 + x)^{12}}^{2 \times 12 = 24}$$

$$G.A. = 14 + 28 + 24 = 3n - 6$$

$$72 = 3n$$

$$24 = n$$



$$n = 24$$



6. Si el polinomio

$$Q(x, y) = 2x^{a+b-1}y^7 - 5x^{2a+b}y^8$$

$\begin{array}{cc} 15 & 15 \\ \hline \end{array}$

es homogéneo de grado 15, calcule a . b

RESOLUCIÓN

$$* a + b - 1 + 7 = 15 \quad \rightarrow \quad a + b = 9$$

$$* 2a + b + 8 = 15 \quad \rightarrow \quad 2a + b = 7$$

restando

$$a = -2$$

$$b = 11$$

$$ab = -22$$



7. Sea $P(x - 3) = (x - 2)^{2020} + (x - 4)^{200} + 2x - 5$.
Calcule el término independiente.

RESOLUCIÓN

$$x - 3 = 0$$

$$x = 3$$

$$P(0) = (3 - 2)^{2020} + (3 - 4)^{200} + 2(3) - 5$$

$$P(0) = (1)^{2020} + (-1)^{200} + 6 - 5$$

$$P(0) = 1 + 1 + 1$$



T.l. es 3



8. Sea $P(2x - 3) = (x - 3)^{54} - (x - 1)^{345} + 3x - 5$
Calcule la suma de coeficientes.

RESOLUCIÓN

$$2x - 3 = 1$$

$$\Rightarrow x = 2$$

$$P(1) = (2 - 3)^{54} - (2 - 1)^{345} + 3(2) - 5$$

$$P(1) = (-1)^{54} - (1)^{345} + 6 - 5$$

$$P(1) = 1 - 1 + 6 - 5 \Rightarrow P(1) = 1$$



9. Reduce

$$M = 2^{4^{2-1}} + 7^{8^{3-1}}$$

RESOLUCIÓN

$$M = 2^{4^{1/2}} + 7^{8^{1/3}}$$

$$M = 2^2 + 7^2$$

$$M = 4 + 49$$



53



10. Sea $P(x^x) = (x - 4)^{2020} + 5x - 1$.
Calcule $P(27) + P(4)$

RESOLUCIÓN

$$x^x = 27 \Rightarrow x = 3$$

$$P(27) = (3 - 4)^{10} + 5(3) - 1$$

$$P(27) = (-1)^{10} + 15 - 1$$

$$P(27) = 15$$

$$x^x = 4 \Rightarrow x = 2$$

$$P(4) = (2 - 4)^{10} + 5(2) - 1$$

$$P(4) = (-2)^{10} + 10 - 1$$

$$P(4) = 1024 + 9 = 1033$$



$$P(27) + P(4) = 1048$$