ALGEBRA

2th
Session II

HELICO
ASESORÍA

Tomo 2

SACO OLIVEROS

1. Reduce $H = \dfrac{(x^4 . x^{(-3)^2} . x^{-(-1)^{2020}})^5}{x^{4^3} . x^{(-3)^2}}$

RESOLUCIÓN

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

$$x^{-13}$$

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

RESOLUCIÓN

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

$$A = 5 + \frac{4}{5} - \frac{2}{5} = 5 + \frac{2}{5}$$

$$27/5$$

3. Halle el valor de x, en

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

RESOLUCIÓN

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

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

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

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

$$\Rightarrow \boxed{-17/15 = x}$$

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

Evalúe P(2)

RESOLUCIÓN

$x - 1 = 2$

$x = 3$

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

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

$$P(2) = \boxed{-23}$$

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

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

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

$$72 = 3n$$

$$24 = n \Rightarrow \boxed{n = 24}$$

6. Si el polinomio

$$Q(x,y) = \overbrace{2x^{a+b-1}y^{7}}^{15} - \overbrace{5x^{2a+b}y^{8}}^{15}$$

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

$$a = -2 \qquad b = 11$$

$$ab = -22$$

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.I. $es\ 3$

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

Calcule la suma de coeficientes.

RESOLUCIÓN

$2x-3=1$

$\Rightarrow \quad x=2$

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

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

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

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

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

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

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

$P(27)=15$

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

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

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

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

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