ALGEBRA

2th

Session I

RETROALIMENTACIÓN

SACO OLIVEROS

HELICO RETRO

CHAPTER I

SAGO OLIVEROS

1. Calcule el valor de 6M

$$M = \left(\frac{6}{7}\right)^{-1} + \left(\frac{3}{2}\right)^{-1} - \left(\frac{6}{11}\right)^{-1} + \left(\frac{6}{5}\right)^{-1}$$

RESOLUCIÓN

$$M = \left(\frac{7}{6}\right)^{1} + \left(\frac{2}{3}\right)^{1} - \left(\frac{11}{6}\right)^{1} + \left(\frac{5}{6}\right)^{1}$$

$$M = \frac{7}{6} + \frac{4}{6} - \frac{11}{6} + \frac{5}{6} = \frac{5}{6}$$

$$6M = \cancel{6} \times \frac{5}{\cancel{6}} \Rightarrow \boxed{6M = 5}$$

RECORDEMOS

$$\left(\frac{a}{b}\right)^{-n} = \left(\frac{b}{a}\right)^{n}$$

$$a \wedge b \neq 0$$

Nota:

$$\left(\frac{2}{3}\right) = \left(\frac{4}{6}\right)$$

2. Efectúe

$$R = \frac{3^{-3}}{3^{-5}} + \frac{4^{6}}{4^{4}} + \frac{6^{1}}{6^{-1}}$$

RESOLUCIÓN

$$R = 3^{-3-(-5)} + 4^{6-4} + 6^{1-(-1)}$$

$$R = 3^{2} + 4^{2} + 6^{2}$$

$$R = 9 + 16 + 36$$

$$R = 61$$

RECORDEMOS

$$\frac{x^{m}}{x^{n}} = x^{m-n}; x \neq 0$$

3. A qué es igual

$$D = \frac{2^{(-5)^{2^2}} \cdot 2^{-5^{2^2}} \cdot 2^{3^2}}{(2^3)^{2^2} \cdot 2^{-3}}$$

RECORDEMOS

Nota:

$$(-5)^4 = 5^4$$

$$x^n \cdot x^m = x^{n+m}$$

RESOLUCIÓN

$$D = \frac{2^{(-5)^4} \cdot 2^{-5^4} \cdot 2^9}{(2^3)^4 \cdot 2^{-3}} = \frac{2^{5^4} \cdot 2^{-5^4} \cdot 2^9}{2^{12} \cdot 2^{-3}} = \frac{2^9}{2^9} = 1$$

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CHAPTER II

SAGO OLIVEROS

4. Halle el equivalente de:

$$R = \sqrt[5]{\frac{243x^{13}y^{22}}{x^3y^2}} \; -$$

RESOLUCIÓN

$$R = \sqrt[5]{243x^{10}y^{20}}$$

$$R = \sqrt[5]{243}.\sqrt[5]{x^{10}}.\sqrt[5]{y^{20}}$$

$$R = 3x^2y^4$$

RECORDEMOS

Si las raíces existen en los reales.

$$\sqrt[n]{xy} = \sqrt[n]{x}\,.\,\sqrt[n]{y}$$

$$\left(\sqrt[n]{a}\right)^m = a^{\frac{m}{n}}; m, n \in \mathbb{Z}; n \geq 2$$

5. **Reduzca**

$$F = \frac{\sqrt[5]{\sqrt[3]{\sqrt[4]{x^{70}}}}}{\sqrt[60]{x^{10}}} \quad ; x \neq 0$$

RECORDEMOS

$$\sqrt[m]{\sqrt[n]{\sqrt[p]{x}}} = \sqrt[m\times n\times p]{x}$$

RESOLUCIÓN

$$F = \frac{\sqrt[5]{\sqrt[3]{\sqrt[4]{x^{70}}}}}{\sqrt[60]{x^{10}}} = \frac{\sqrt[5\times 3\times 4]{x^{70}}}{\sqrt[60]{x^{10}}} = \frac{\sqrt[60]{x^{70}}}{\sqrt[60]{x^{10}}} = \sqrt[60]{\frac{x^{70}}{x^{10}}} = \sqrt[60]{x^{60}}$$

$$\boxed{F = x}$$

6. Efectúe $T = \sqrt{(9)^5} + \sqrt[4]{(625)^3} + \sqrt[4]{(16)^3}$

RESOLUCIÓN

$$T = \left(\sqrt{9}\right)^5 + \left(\sqrt[4]{625}\right)^3 + \left(\sqrt[4]{16}\right)^3$$

$$T = (3)^5 + (5)^3 + (2)^3$$

$$T = 243 + 125 + 8$$

$$\boxed{T = 376}$$

RECORDEMOS

Si las raíces existen en los reales.

$$\sqrt[n]{a^m} = \left(\sqrt[n]{a}\right)^m;$$
$$m, n \in \mathbb{Z}; n \geq 2$$

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CHAPTER III

SAGO OLIVEROS

7. Si: $7^{5^{7x+3}} = 7^{5^{2x+13}}$ Halle el valor de x

RESOLUCIÓN

$$7^{5^{7x+3}} = 7^{5^{2x+13}}$$

$$5^{7x+3} = 5^{2x+13}$$

$$7x + 3 = 2x + 13$$

$$7x - 2x = 13 - 3$$

$$5x = 10$$

$$x = 2$$

RECORDEMOS

$$a^x = a^y \rightarrow x = y$$

$$\forall\, a \in \mathbb{R} - \{-1; 0; 1\}$$

8. Calcula el valor de m, si $2^{m-3} + 2^{m-2} + 2^{m-1} = 14$

RESOLUCIÓN

$$2^{m-3}.(2^0 + 2^1 + 2^2) = 14$$

$$2^{m-3}.(7) = 14$$

$$2^{m-3} = 2^1$$

$$m = 4$$

RECORDEMOS

$$x^{n+m} = x^n \,.\, x^m$$

$$a^x = a^y \rightarrow x = y$$

$$\forall\, a \in \mathbb{R} - \{-1; 0; 1\}$$

9. **Halle el valor de p:**

$$\left(\frac{11}{16}\right)^{16p-48} = 1$$

RESOLUCIÓN

$$\left(\frac{11}{16}\right)^{16p-48} = \left(\frac{11}{16}\right)^{0}$$

$$16p - 48 = 0$$

$$p = 3$$

RECORDEMOS

Nota: $\left(\frac{11}{16}\right)^{0} = 1$

$$a^x = a^y \rightarrow x = y$$

$$\forall\, a \in \mathbb{R} - \{-1; 0; 1\}$$

10. **Roberto heredó el siguiente terreno rectangular, al cuál le desea calcular su área para así comenzar una construcción.**

Al realizar la medición del área le resultó 1024 m^2. Halle el valor de x.

RESOLUCIÓN

Área del terreno

$$8^{3x} \times 2^x = 1024$$

$$(2^3)^{3x} \times 2^x = 1024$$

$$2^{9x} \times 2^x = 1024$$

$$2^{10x} = 2^{10}$$

$$10x = 10$$

$$\boxed{x = 1}$$