ALGEBRA

2th

Session I

RETROALIMENTACIÓN

SACO OLIVEROS

HELICO RETRO

CHAPTER I

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

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

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

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

RECORDEMOS

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

$$a\ \wedge\ b\neq 0$$

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

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

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

$$R = 9 + 16 + 36$$

$$\boxed{R = 61}$$

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

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

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CHAPTER II

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4. Halle el equivalente de:

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

RECORDEMOS

Si las raíces existen en los reales.

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

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

RESOLUCIÓN

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

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

$$\boxed{R = 3x^2y^4}$$

5. **Reduzca**

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

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

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

RESOLUCIÓN

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

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

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

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

$$5x = 10$$

$$\boxed{x = 2}$$

RECORDEMOS

$$\boxed{a^x = a^y \rightarrow x = y}$$

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

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

RESOLUCIÓN

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

$$2^{m-3} \cdot (\cancel{7}^{\,1}) = \cancel{14}^{\,2}$$

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

$$\boxed{m = 4}$$

RECORDEMOS

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

$$\boxed{a^x = a^y \rightarrow x = y}$$

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

9. **Halle el valor de p:** $\left(\frac{11}{16}\right)^{16p-48} = 1$

RESOLUCIÓN

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

$$16p - 48 = 0$$

$$\boxed{p = 3}$$

RECORDEMOS

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

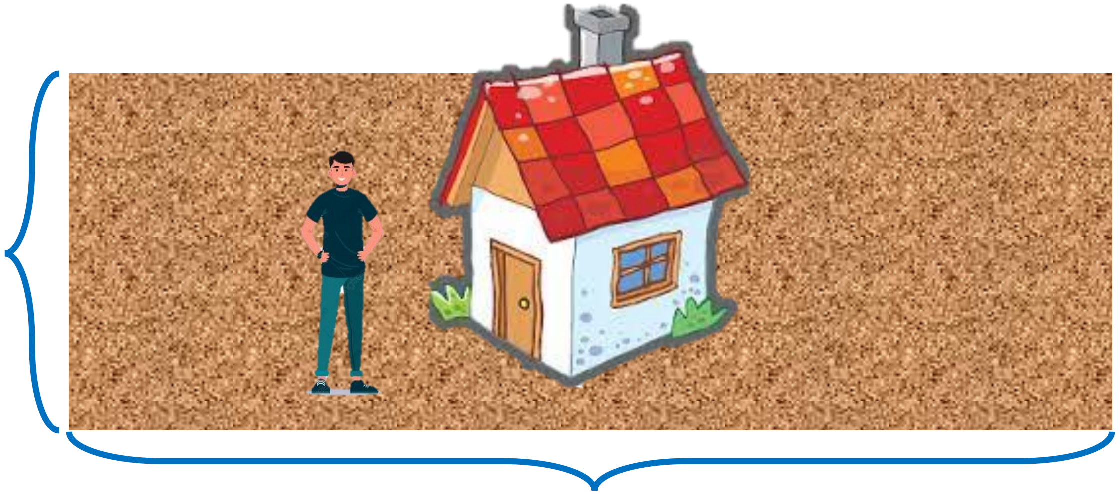
$$a^x = a^y \rightarrow x = y$$

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

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

2^x

ALTURA



8^{3x} → BASE

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

RESOLUCIÓN

Área del terreno

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

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

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

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

$$10x = 10$$

$$\boxed{x = 1}$$