

## Semana #02

### Teoría de Exponentes

- potenciación
- radicación

$$\emptyset \quad x^7 \cdot x^{-5} = x^{7+(-5)} = x^2$$

$$\emptyset \quad \frac{x^{10}}{x^2} = x^{10-2} = x^8$$

$$\emptyset \quad (x^{-2})^{-5} = x^{(-2)(-5)} = x^{10}$$

$$\emptyset \quad (x^2 y^3)^5 = (x^2)^5 (y^3)^5 = x^{10} y^{15}$$

$$\emptyset \quad x^{-1} = \frac{1}{x} \quad \left(\frac{a}{b}\right)^{-1} = \frac{b}{a}$$

$$x^{-2} = \frac{1}{x^2}$$

$$\emptyset \quad \sqrt[5]{x^{20}} = x^{\frac{20}{5}} = x^4$$

$$\emptyset \quad \sqrt[3]{4^5 x} = \frac{5 \cdot 4}{3} x^{\frac{1}{3}} = \frac{20}{3} x^{\frac{1}{3}}$$

$$\emptyset \quad \sqrt[3]{x y} = \sqrt[3]{x} \sqrt[3]{y}$$

$$\sqrt[3]{\frac{x}{y}} = \frac{\sqrt[3]{x}}{\sqrt[3]{y}} \quad \text{OJO} \quad \sqrt[3]{xy} \neq \sqrt[3]{x} \sqrt[3]{y}$$

OBS:  $x^{\frac{1}{2}} \cdot \left( (x^{\frac{1}{2}})^3 \right)^5 = x^{\frac{1}{2}} \cdot (x^{\frac{3}{2}})^5 = x^{\frac{1}{2}} \cdot x^{\frac{15}{2}} = x^{16}$

$$x^{\frac{1}{2}} \cdot x^{\frac{1}{2}} \cdot x^{\frac{1}{2}} = x^{\frac{3}{2}}$$

OP = INDET

Prop:  $\frac{a+a}{2} = \frac{2a}{2} = a$

$$1) \quad \sqrt[4]{20 + \sqrt[4]{20 + \sqrt[4]{20} \dots}} = \sqrt[4]{4(20+1)} = \sqrt[4]{84}$$

$$2) \quad \sqrt[3]{2 - \sqrt[3]{2 - \sqrt[3]{2} \dots}} = \sqrt[3]{4(2+1)} = \sqrt[3]{12}$$

$$3) \quad \sqrt[3]{60 + \sqrt[3]{60 + \sqrt[3]{60} \dots}} = 4$$

$$\sqrt[3]{6 + \sqrt[3]{6 + \sqrt[3]{6} \dots}} = 2$$

$$4) \quad \sqrt[4]{4 \sqrt[4]{4 \sqrt[4]{4} \dots}} = \sqrt[4]{4} = 2$$

$$\sqrt[4]{125 \sqrt[4]{125 \sqrt[4]{125} \dots}} = \sqrt[4]{125} = 5$$

$$5) \quad \sqrt[5]{\frac{64}{5 \sqrt[5]{64}}} = \sqrt[5]{\frac{64}{5 \cdot \frac{1}{5}}} = \sqrt[5]{64} = 2$$

$$6) \quad \sqrt[5]{x^3 \sqrt[4]{x^2 \sqrt[3]{x}}} = \sqrt[60]{x^{43}}$$

$$7) \quad \sqrt[5]{x} \sqrt[5]{x} \sqrt[5]{x} = x$$

$$8) \quad x^{\frac{1}{n}} = x^{\frac{1}{n}} \rightarrow x = \sqrt[n]{x}$$

$$9) \quad x^{\frac{1}{3}} = x^{\frac{1}{3}} \rightarrow x = \sqrt[3]{x}$$

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$$3125^{7-x} = 5^5$$

$$(5^5)^{25^{7-x}} = 5^5$$

$$5^{5 \cdot 25^{7-x}} = 5^5$$

$$25^{7-x} = 1$$

$$7-x = 0$$

$$x = 7$$

$$(x+1)^x = x^x \cdot 2x+1$$

$$x^x = (x+1)^{2x+1}$$

$$2 = (x+1)^{2x+1}$$

$$2 = (x+1)^{2x+1}$$

$$\sqrt{2} = x+1$$

$$x = \sqrt{2} - 1$$

$$3\sqrt{5} \cdot 3\sqrt{2} \cdot 3\sqrt{5} \cdot 3\sqrt{2} \dots$$

$$3\sqrt{5} \cdot 3\sqrt{2} \cdot 3\sqrt{5} \cdot 3\sqrt{2} \dots = A$$

$$3\sqrt{5} \cdot 3\sqrt{2} \cdot A = A$$

$$5\sqrt{32}A = A^3$$

$$32A = A^3$$

$$32 = A^2$$

$$A = 4$$

$$81^{1/4} \cdot 81^{1/4} \cdot 81^{1/4} \cdot 81^{1/4} = 81^{1/2} = 9$$

$$F = \left( \sqrt[4]{\frac{81}{16}} \right)^{1/4} = \left( \sqrt[4]{\frac{81}{16}} \right)^{1/4}$$

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$$x = 2000$$

$$2^x + 2^{x+1} + \dots + 2^{x+10}$$

$$2^x (1 + 2 + 2^2 + \dots + 2^{10})$$

$$2^x (2^{11} - 1)$$

$$2^x = 2^{11} - 1$$

$$x = 11$$

$$x^x = 4\sqrt{\frac{1}{2}}$$

$$x^x = \left(\frac{1}{2}\right)^{1/4}$$

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$$I. A^2 = B^2$$

$$A = B$$

$$II. A^2 = A^3$$

$$A = B$$

$$III. A^2 = B^2$$

$$A = B$$

$$IV. A^2 = B^2$$

$$A = B$$