POTENCIA PRAXIS

$$4.4.4 \times 4.4 = 4^3 . 4^2 = 4^5$$

$$\frac{3.3.3.3.3}{3.3.3} = \frac{3^5}{3^3} = 3^{5-3} = 3^2$$

$$\frac{2.2.2.2.2.2}{2.2.2} = \frac{2^6}{2^3} = 2^{6-3} = 2^3$$

$$\frac{4^2 . 4^{-3} . 4^4}{4^{-2} . 4^3 . 4^{-2}} = \frac{4^{(2-3+4)}}{4^{(-2+3-2)}} = \frac{4^3}{4^{-1}} = 4^{3+1} = 4^4$$

CANON = LEI

$$x^a . x^b = x^{a+b}$$

$$\frac{x^a}{x^b} = x^{a-b}$$

$$\boxed{x^0 = 1}$$

ΠΡΑΞΗΣ

A) $2.2 \times 2.2 =$

B) $3.3 \times 3.3 =$

C) $3.33 \times 3 =$

D) $4 \times 4.4.4 =$

E) $5.55 \times 5 =$

F) $7.7 \times 7.7 =$

G) $\frac{3.3.3}{3.3} =$

H) $\frac{6.6.6}{6.} =$

I) $\frac{9.9.9.9}{9.9.9} =$

J) $\frac{4.4.4.4}{4} =$

K) $\frac{3.3.3.3}{3.3.3} =$

L) $\frac{2^1}{2^1}$

M) $\frac{4^3}{4^3}$

N) $\frac{3^3}{3^3}$

Ν) $\frac{5^5}{5^5}$

POTENTIA PRAXIS

$$\frac{1}{3^2} = \frac{1}{3^2} \cdot \frac{3^2}{3^{-2}} = \frac{3^{-2}}{3^0} = 3^{-2}$$

$$\frac{2}{3^4} = \frac{2}{3^4} \cdot \frac{3^{-4}}{3^{-4}} = \frac{2 \cdot 3^{-4}}{3^0} = \frac{2 \cdot 3^{-4}}{1} = 2 \cdot 3^{-4}$$

EXERCICIO

A) $\frac{1}{2^3} =$

B) $\frac{1}{6^2} =$

C) $\frac{1}{7^1} =$

D) $\frac{1}{4^2} =$

E) $\frac{1}{3^4} =$

F) $\frac{1}{2^{-4}} =$

G) $\frac{1}{7^{-2}} =$

H) $\frac{1}{4^{-6}} =$

I) $\frac{1}{3^{-2}} =$

J) $\frac{1}{3^{-4}} =$

EXERCICIO

$$\frac{3^5 \times 3^2 \times 3^4}{3^3 \times 3^6} = \frac{3^{11}}{3^9} = 3^{11-9} = 3^2 = 9$$

A) $\frac{7^3 \times 7^4 \times 7^{-2} \times 7^1}{7^5 \times 7^2 \times 7^{-1}} =$

B) $\frac{3^6 \times 3^1 \times 3^{-2}}{3^4 \times 3^3} =$

C) $\frac{5^2 \times 5^{-2} \times 5^{-3} \times 5^4}{5^{-2} \times 5^{-2} \times 5^1} =$

D) $\frac{2^{-3} \times 2^{-3} \times 2^{-2}}{2^{-2} \times 2^{-1} \times 2^{-6}} =$

E) $\frac{2^6 \times 2^7 \times 2^{-4} \times 2^{-3}}{2^1 \times 2^2 \times 2^2} =$

EXEMPLUM

$$\left[\frac{4}{3}\right]^{-2} = \frac{\left[\frac{4}{3}\right]^{-2} \cdot \left[\frac{4}{3}\right]^{2}}{\left[\frac{4}{3}\right]^{2}} = \frac{\left[\frac{4}{3}\right]^{-2+2}}{\left[\frac{4}{3}\right]^{2}} = \frac{\left[\frac{4}{3}\right]^{0}}{\left[\frac{4}{3}\right]^{2}} = \frac{1}{\frac{16}{9}} =$$

$$= \frac{1}{\frac{16}{9}} = \frac{1}{\frac{16}{9}} \times \frac{9}{9} = \frac{9}{16} \Rightarrow \left[\frac{4}{3}\right]^{-2} = \left[\frac{3}{4}\right]^{2} = \frac{9}{16}$$

A) $\left[\frac{3}{2}\right]^{-1}$ B) $\left[\frac{7}{3}\right]^{-3}$ C) $\left[\frac{2}{5}\right]^{-2}$

DECIMAL POTENTIA

$10^3 = 1000$

$10^2 = 100$

$10^1 = 10$

$10^0 = 1$

$10^{-1} = 0,1$

$10^{-2} = 0,01$

$10^{-3} = 0,001$

DECIMAL PRAXIS

$$3 \times 10^{-2} = \frac{3}{10^2} = \frac{3}{100} = 0{,}03$$

$$0{,}005 = 0{,}001 \times 5 = \frac{1}{1000} \cdot 5 = \frac{1}{10^3} \cdot 5 = 5 \cdot 10^{-3}$$

$$\frac{5 \times 10^{-3} \cdot 3 \times 10^{24}}{2 \times 10^2} = \frac{15 \times 10^{21}}{2 \times 10^2} = \frac{15}{2} \times 10^{21-2} = \frac{15}{2} \times 10^{19}$$

PRAXIS

A) 1×10^{-1}

B) 4×10^{-2}

C) 6×10^{-3}

D) 2×10^{-1}

E) 9×10^{-2}

F) 2×10^{-3}

Exemplos

$0,1 = 1 \times 10^{-1} = \frac{1}{10^1}$

$0,01 = 1 \times 10^{-2} = \frac{1}{10^2}$

$0,001 = 1 \times 10^{-3} = \frac{1}{10^3}$

$0,2 \times 0,03 =$

$2 \times 10^{-1} \times 3 \times 10^{-2} =$

$6 \times 10^{-3} = 6 \times \frac{1}{10^3}$

Exercício

1) 0,2
2) 0,04
3) 0,005
4) 0,5 x 0,2
5) 0,07 x 0,01
6) 0,009 x 0,03

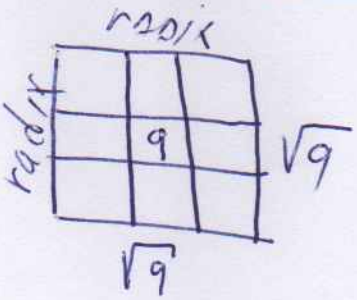
EXEMPLO

$$\frac{0,03 \times 0,002 \times 0,1}{0,004 \times 0,2 \times 0,001} = \frac{3\times10^{-2} \times 2\times10^{-3} \times 1\times10^{-1}}{4\times10^{-3} \times 2\times10^{-1} \times 1\times10^{-3}} = \frac{6\times10^{-6}}{8\times10^{-7}} = \frac{6}{8} \times 10^{+1}$$

$$\frac{50 \times 0,02 \times 0,003}{0,007 \times 0,02 \times 0,1} =$$

$$\frac{0,0005 \times 0,0007 \times 0,1}{0,01 \times 0,05 \times 0,2} =$$

POTENTIA CANON



$$\sqrt{a} \cdot \sqrt{a} = a$$

$$\boxed{a} \sqrt{a}$$

$\sqrt{a}$

$$\sqrt{a} \cdot \sqrt{a} = a^1$$

$$a^{\frac{1}{2}} \cdot a^{\frac{1}{2}} = a^1$$

$$a^{\frac{1}{2}+\frac{1}{2}} = a^1$$

$$\boxed{\sqrt{a} = a^{\frac{1}{2}}} \Rightarrow \text{CANON}$$

EXEMPLUM

$\boxed{4}^{\sqrt{4}}$ $\boxed{\sqrt{4}}$ $\Rightarrow \sqrt{4} \cdot \sqrt{4} = 4$

$\boxed{2}^{\sqrt{2}}$ $\boxed{\sqrt{2}}$ $\Rightarrow \sqrt{2} \cdot \sqrt{2} = 2$

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

$\sqrt{2} \cdot \sqrt{2} = 2^{\frac{1}{2}} \cdot 2^{\frac{1}{2}} = 2^1$

$$\sqrt[N]{X} = X^{\frac{1}{N}}$$

① $\sqrt[2]{4} =$	$\sqrt[3]{4} =$	$\sqrt[4]{4} =$
② $\sqrt[2]{14} =$	$\sqrt[3]{14} =$	$\sqrt[4]{14} =$
③ $\sqrt[2]{36} =$	$\sqrt[3]{36} =$	$\sqrt[4]{36} =$
QUADRATUM	CUBUS	QUADRATUM QUADRATUM.

POTENTIA CANON

$\sqrt{x} \cdot \sqrt{y} = x^{\frac{1}{2}} \cdot y^{\frac{1}{2}} = (x \cdot y)^{\frac{1}{2}}$

$\sqrt{x} \cdot \sqrt{y} = \sqrt{x \cdot y}$

$\sqrt{4} \cdot \sqrt{9} = 4^{\frac{1}{2}} \cdot 9^{\frac{1}{2}} = (4 \cdot 9)^{\frac{1}{2}}$

$\sqrt{4} \cdot \sqrt{9} = \sqrt{4 \cdot 9}$

EX.

① $\sqrt{16} \times \sqrt{16}$

② $\sqrt{9} \times \sqrt{5}$

③ $\sqrt{6} \times \sqrt{3}$

④ $\sqrt{20} \times \sqrt{2}$

⑤ $\sqrt{81} \times \sqrt{25}$

⑥ $\sqrt{4} \times \sqrt{25}$

⑦ $\sqrt{7} \times \sqrt{25}$

⑧ $\sqrt{3} \times \sqrt{4}$

$\sqrt{\frac{4}{9}} = \frac{\sqrt{4}}{\sqrt{9}} = \frac{2}{3}$

① $\sqrt{\frac{16}{4}}$ ② $\sqrt{\frac{16}{81}}$ ③ $\sqrt{\frac{9}{5}}$

POTENZA CANON

$$\frac{a}{\sqrt{b}} = \frac{a}{\sqrt{b}} \cdot \frac{\sqrt{b}}{\sqrt{b}} = \frac{a \cdot \sqrt{b}}{b}$$

Ex ① $\frac{1}{\sqrt{9}} = \frac{1}{\sqrt{9}} \cdot \frac{\sqrt{9}}{\sqrt{9}} = \frac{\sqrt{9}}{9} = \frac{3}{9} = \frac{1}{3}$

② $\frac{1}{\sqrt{4}} =$ ② $\frac{8}{9^{\frac{1}{2}}} =$ ③ $\frac{7}{4^{\frac{1}{2}}} =$

DIOPHANTO CANON

$(+) \cdot (+) = (+)$

$(+) \cdot (-) = (-)$

$(-) \cdot (+) = (-)$

$(-) \cdot (-) = (+)$