

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) $0,5 \times 0,2$

5) $0,07 \times 0,01$

6) $0,009 \times 0,03$

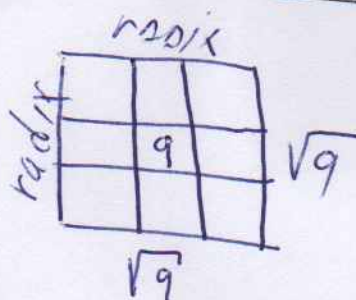
Exemplo

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

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

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

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

$$\frac{4}{\sqrt{4}} \Rightarrow \sqrt{4} \cdot \sqrt{4} = 4$$

$$\frac{2}{\sqrt{2}} \Rightarrow \sqrt{2} \cdot \sqrt{2} = 2$$

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

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

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

$$\textcircled{1} \sqrt[2]{4} =$$

$$\textcircled{2} \sqrt[2]{14} =$$

$$\textcircled{3} \sqrt[2]{36} =$$

QUADRATUM

$$\sqrt[3]{4} =$$

$$\sqrt[3]{14} =$$

$$\sqrt[3]{36} =$$

CUBUS

$$\sqrt[4]{4} =$$

$$\sqrt[4]{14} =$$

$$\sqrt[4]{36} =$$

QUADRATUM
QUADRATUM.

POTENTIAL CANON

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

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

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

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

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 $\sqrt{9} \times \sqrt{25}$

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 $\sqrt{\frac{9}{5}}$

POTENTIAL CANON

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

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 $\frac{1}{\sqrt{4}} =$

③ $\frac{8}{9^{\frac{1}{2}}} =$

④ $\frac{7}{4^{\frac{1}{2}}} =$

DIOPHANTO CANON

$$(+). (+) = (+)$$

$$(+). (-) = (-)$$

$$(-). (+) = (-)$$

$$(-). (-) = (+)$$

PRAXIS

15

- 1) $(+10) + (+2) = +10 + 2 = +12$
- 2) $(+10) + (-2) = +10 - 2 = +8$
- 3) $(+10) - (+2) = +10 - 2 = +8$
- 4) $(+10) - (-2) = +10 + 2 = +12$
- 5) $(+10) \times (+2) = +20$
- 6) $(+10) \times (-2) = -20$
- 7) $(+10) \div (+2) = +5$
- 8) $(+10) \div (-2) = -5$

EXPRESSÕES NUMÉRICAS

$$\begin{aligned}
 \text{A)} \quad & 12 + [35 - (10 + 2) + 2] = \\
 & = 12 + [35 - 12 + 2] = \\
 & = 12 + [23 + 2] = \\
 & = 12 + [25] = \\
 & = 12 + 25 = 37
 \end{aligned}$$

COMO RESOLVER

1. ()

2. []

3. { }

1. RADICIAÇÃO OU POTENCIAÇÃO

2. MULTIPLICAÇÃO DIVISÃO

3. ADIÇÃO OU SUBTRAÇÃO

$$\begin{aligned}
 \text{B)} \quad & [(18 + 3 \times 2) \div 8 + 5 \times 3] \div 6 \\
 & = [3]
 \end{aligned}$$

$$c) 1 + \{5 + [(3 - 2) + (10 - 8)] + 2\} = \textcircled{11}$$

$$\text{no computador} = R = 1 + (5 + ((3 - 2) + (10 - 8)) + 2) \\ 4 \neq 3 + ((10) + (5 - 8)) + 5$$

$$d) [(1 - 2) + 6] - \{2 - 5 \times (3 - 2) + [1 - (2 - 5)]\} = \textcircled{4}$$

$$e) 3 - \{2 + (11 - 15) - [5 + (-3 + 1)] + 8\} = \textcircled{0}$$

$$f) \{[(8 \times 4 + 3) \div 7 + (3 + 15 \div 5) \times 3] \times 2 - (19 - 7) \div 6\} \times 2 + 12 = \textcircled{100}$$

EXPRESSÕES ALGÉBRICAS

$$y = x^3 - 2x + 1 ; x = -1$$

$$y = (-1)^3 - 2(-1) + 1$$

$$y = -1 + 2 + 1$$

$$y = 2$$

EXERCÍCIOS

$$A) y = x^5 - x^4 + 5 ; x = 1 \Rightarrow y = 5$$

$$B) y = \frac{x^5}{5} + \frac{x^4}{4} - 1 ; x = -1 \Rightarrow y = -19/20$$

$$C) y = -(x - 1)^3 + (1 - x)^2 + 1 ; x = -1$$

EQUAÇÕES DO 2º GRAU

①

$$a \cdot x^2 + b \cdot x + c = 0$$

* a, b e c são números reais

$$\text{DISCRIMINANTE} = \Delta = b^2 - 4 \cdot a \cdot c$$

$\Delta < 0$, N ão existem raízes reais

$\Delta = 0$, duas raízes iguais

$\Delta > 0$, duas raízes diferentes.

PARA DETERMINAR AS RAÍZES UTILIZA-SE BAISKARA

$$x = \frac{-b \pm \sqrt{\Delta}}{2 \cdot a}$$

EXEMPLO

$$\boxed{3x^2 - x + 2 = 0}$$

$$a=3, b=-1, c=2$$

$$\Delta = b^2 - 4.a.c$$

$$\Delta = (-1)^2 - 4.3.2$$

$$\Delta = 1 - 24 = -23 \therefore$$

→ NÃO EXISTEM RAÍZES REAIS!

— x — x — x — x — x — x — x —

$$\boxed{x^2 - 4x + 4 = 0}$$

$$a=1, b=-4, c=4$$

$$\Delta = b^2 - 4.a.c$$

$$\Delta = (-4)^2 - 4.1.4$$

$$\Delta = 16 - 16 = 0 \therefore$$

DUAS RAÍZES REAIS
E IGUAIS!

$$x = \frac{-b \pm \sqrt{\Delta}}{2.a} = \frac{-(-4) \pm \sqrt{0}}{2.1} = \frac{4 \pm 0}{2}$$

$$\rightarrow x' = \frac{4}{2} = 2$$

$$x'' = \frac{4}{2} = 2$$

— x — x — x — x — x — x — x —

$$\underline{a=1, b=-5, c=6}$$

$$\boxed{x^2 - 5x + 6 = 0}$$

$$\Delta = b^2 - 4.a.c$$

$$\Delta = (-5)^2 - 4.1.6$$

$$\Delta = 25 - 24$$

$$\Delta = 1$$

$$x = \frac{-b \pm \sqrt{\Delta}}{2.a} = \frac{-(-5) \pm \sqrt{1}}{2.1} \therefore x = \frac{5 \pm 1}{2}$$

$$x' = \frac{5+1}{2} = \frac{6}{2} = \boxed{3}$$

$$x'' = \frac{5-1}{2} = \frac{4}{2} = \boxed{2}$$

EXERCÍCIO

②

$$A) x^2 - 5x + 6 = 0 \quad (x_1 = 2, x_2 = 3)$$

$$B) x^2 + 7x + 10 = 0 \quad (x_1 = -2, x_2 = -5)$$

$$C) x^2 - 2x - 15 = 0 \quad (x_1 = -3, x_2 = 5)$$

OPERAÇÃO COM EXPRESSÕES ALGÉBRICAS

$$\begin{aligned} & 4b + 3c - a + 4a - 3b - 2c = \\ & = 4b - 3b - a + 4a + 3c - 2c = \\ & = \boxed{b + 3a - c} \end{aligned}$$

$$\begin{aligned} A) & 2x^2y + 3xy - 2xy - x^2y^2 + 5x^2y - 5x + 3x - 3xy + 2x^2y^2 \\ & \quad R. \boxed{x^2y^2 + 7x^2y - 2xy - 2x} \end{aligned}$$

$$\begin{aligned} B) & xy + 3x^2y - x^2 + 5xy - 5x^2 + 3xy - 2x^2y = \\ & \quad R. \boxed{x^2y - 6x^2 + 9xy} \end{aligned}$$

PRODUTOS NOTÁVEIS

③

1) PRODUTO DA SOMA PELA DIFERENÇA:

$$(a+b) \cdot (a-b) = a^2 + ab + ab - b^2 = \boxed{a^2 - b^2}$$

2) QUADRADO DA SOMA:

$$(a+b)^2 = a^2 + 2ab + b^2$$

3) QUADRADO DA DIFERENÇA:

$$(a-b)^2 = a^2 - 2ab + b^2$$

X

EXEMPLOS

X

$$A) (x^3 - 3) \cdot (x^3 + 3) = (x^3)^2 - 3^2 = \boxed{x^6 - 9}$$

$$B) (2x + 4)^2 = (2x)^2 + 2 \cdot (2x) \cdot 4 + 4^2 = \boxed{4x^2 + 16x + 16}$$

$$C) (3m - 2n)^2 = (3m)^2 - 2 \cdot (3m) \cdot (2n) + (2n)^2 = 9m^2 - 12mn + 4n^2$$

EXERCÍCIO

$$A) (x+1)^2 = R. x^2 + 2x + 1$$

$$B) (2x+5)^2 = R. 4x^2 + 20x + 25$$

$$C) (1-2y)^2 = R. 1 - 2y + y^2$$

$$D) (x-1)^2 = R. x^2 - 2x + 1$$

