Exercícios:

a) $(-3)^3$

$-3 \cdot -3 \cdot 3 = -27$

b) $(-2)^1 = -2$

c) 3^4

$3 \cdot 3 \cdot 3 \cdot 3 = 81$

3
27 | 3
81

d) $7^1 = 7$

e) $\left(\frac{2}{-}\right)^3$

e) $\left(\frac{2}{3}\right)^3$

$\frac{2}{3} \cdot \frac{2}{3} \cdot \frac{2}{3} = \frac{8}{27}$

f) $\left(-\frac{1}{3}\right)^4 = \frac{1}{81}$

$\left(-\frac{1}{3}\right) \cdot \left(-\frac{1}{3}\right) \cdot \left(-\frac{1}{3}\right) \cdot \left(-\frac{1}{3}\right)$

g) $\left(\frac{1}{2}\right)^3 = \frac{1}{2} \cdot \frac{1}{2} \cdot \frac{1}{2} = \frac{1}{8}$

$$h)\left(\frac{2}{3}\right)^0 = 1$$

$$i) -2^2 = 2$$

$$j) -\left(-\frac{3}{2}\right)^3 = \frac{27}{8}$$

$$k) (-7)^{70} = 1$$

$$m = 0^7 = 0$$

$$n = (-4)^0 = 1$$

$$o) -5^0 = 1$$

Propriedade das potências

Exercícios:

3) $A = (-1)^{2n} \cdot (-1)^{2n+3} + (-1)^{3n} - (-1)^{n}$

$(-1)^{2n} = 1$

$(-1)^{2n+3} = -1$

4) a) $5^3 \cdot 5^2 = 5^6$ → Falso

b) $3^6 : 3^2 = 3^3$ → Falso

c) $2^3 \cdot 3 = 6^3$ → Falso

d) $(2+3)^4 = 2^4 + 3^4$ → Verdadeiro

6) a) $(a^2 \cdot b^3)^2 \cdot (a^3 \cdot b^2)^3$

d) $(2+5)^2 = 2^2 + 3$ D'berardino

b) $(a \cdot (a^2 \cdot b^3)^2 \cdot (a^3 \cdot b^2)^3$

$a^4 \cdot b^6 \cdot a^9 \cdot b^6$

$a^{13} \cdot b^{12}$

b) $\dfrac{(a^4 \cdot b^2)^3}{(a \cdot b^2)^2} = \dfrac{a^{12} \cdot b^6}{a^2 \cdot b^4} = a^{10} \cdot b^2$

c) $[(a^3 \cdot b^2)^3]^3 = (a^3 \cdot b^2)^6 = a^{18} \cdot b^{12}$

d) $\left(\dfrac{a^4 \cdot b^3}{a^2 \cdot b}\right)^5 = \dfrac{a^{20} \cdot b^{15}}{a^{10} \cdot b^5} = a^{10} \cdot b^{10}$

e) $\dfrac{(a^2 \cdot b^3)^4 \cdot (a^3 \cdot b^4)^2}{(a^3 \cdot b^2)^3}$

e) $\dfrac{a^5 \cdot b^{12} \cdot a^6 \cdot b^8}{} - \dfrac{a^{12} \cdot b^{20}}{} = a^3 \cdot b^{14}$

e) $\frac{a^5 \cdot b^{12} \cdot a^6 \cdot b^8}{a^2 \cdot b^6} : \frac{a^{12} \cdot b^{20}}{a^2 \cdot b^6} : a^3 \cdot b^{14}$

f) Se a e $b = \{0\}$

g) $x = 2$ m. 78

g) $19 \times 19 = 196 \times 19 = 2744 \times 19 = 38976$

$38976 \times 19 = 537,824$

6, 4, 6, 4 par = 6

1 3 4 5

Último algarismo é 6.

• Potência de expoente inteiro negativo.

Exercice 2)

a/ $\dfrac{2^{-1} - (-2)^2 + (-2)^{-1}}{2^2 - 2^{-2}}$

$\dfrac{\frac{1}{2} - (4) + \left(-\frac{1}{2}\right)}{4 - \left(\frac{1}{4}\right)} = \dfrac{\frac{1}{2} - \frac{4}{1} - \frac{1}{2}}{\frac{4}{1} - \frac{1}{4}} = \dfrac{-\frac{4}{1}}{\frac{15}{4}}$

$\dfrac{-\frac{4}{1}}{\frac{15}{4}} = -\frac{4}{1} \cdot \frac{4}{15} = -\frac{16}{15}$

b/ $\dfrac{3^2 - 3^{-2}}{3^2 + 3^{-2}} = \dfrac{9 - \frac{1}{9}}{9 + \frac{1}{9}} = \dfrac{\frac{9}{1} - \frac{1}{9} = \frac{1 - 81}{9} = -\frac{80}{9}}{\frac{9}{1} + \frac{1}{9} = \frac{1 + 81}{9} = \frac{82}{9}}$

$3^{-2} = \frac{1}{9}$

$\dfrac{\frac{80}{9}}{\frac{82}{9}} = -\frac{80}{9} \cdot \frac{9}{82} = -\frac{80 : 2}{82 : 2} = -\frac{40}{41}$

c/ $\left(-\frac{1}{2}\right)^2 \cdot (2)^3 = \frac{1}{4} \cdot 8 = \frac{8}{4} = 2$

$$\frac{9}{}$$

c) $\dfrac{\left(-\frac{1}{2}\right)^2 \cdot \left(\frac{1}{2}\right)^3}{\left[\left(-\frac{1}{2}\right)^2\right]^3} = \frac{1}{4} \cdot \frac{1}{8} = \frac{1}{32}$

$\left[\left(-\frac{1}{2}\right)^2\right]^3 = \left(-\frac{1}{2}\right)^6 = \frac{1}{64}$

$\frac{1}{32} \cdot \frac{64}{1} = \frac{64}{32} = 2$

11)

a) $3^{-1} = \left(\frac{3}{1}\right)^{-1} = \left(\frac{1}{3}\right)^1$

b) $(-2)^{-1} = \left(\frac{-2}{1}\right)^{-1} = \left(-\frac{1}{2}\right)^1$

c) $-3^{-1} = \left(\frac{-3}{1}\right)^{-1} = \left(-\frac{1}{3}\right)^1$

d) $\left(-\frac{2}{3}\right)^{-1} = \left(-\frac{3}{2}\right)^1$ $\left(\frac{1}{2}\right)^1 = 2$

$$d) -(-3)^{-1} = \left(\frac{-3}{1}\right)^{-1} = \left(\frac{1}{3}\right)^{1} = +\frac{1}{3}$$

$$e) 2^{-2} = \left(\frac{2}{1}\right)^{-2} = \left(\frac{1}{2}\right)^{2} = \frac{1}{4}$$

$$f) (-3)^{-2} = \left(-\frac{3}{1}\right)^{-2} = \left(\frac{1}{3}\right)^{2} = \frac{1}{9}$$

$$g) -5^{-2} = \Rightarrow \left(\frac{5}{1}\right)^{-2} = \left(\frac{1}{5}\right)^{2} = \frac{1}{25}$$

$$h) \left(\frac{1}{3}\right)^{-2} = \left(\frac{3}{1}\right)^{2} = \frac{9}{1}$$

$$i) \left(\frac{3}{2}\right)^{-1} = \left(\frac{2}{3}\right)^{1} = \frac{2}{3}$$

72) $\frac{x^{-1}+y^{-1}}{(xy)^{-1}} = \frac{x^{-1}+y^{-1}}{x^{-1}\cdot y^{-1}}$

$\frac{1^1}{x^1} \cdot \frac{1^1}{y^1} = \frac{x+y}{xy} = \frac{1}{\frac{xy}{x+y}}$ inverto

$\frac{x+y}{xy} \cdot \frac{xy}{1} = \frac{x+y+xy}{xy} = x+y$

73) a) $(5^3)^{-2} = 5^{-6}$ → Vero

b) $2^{-9} = -76$ → Falso

c) $(\pi+2)^{-2} = \pi^{-2}+2^{-2}$ → Vero

d) $3^{-9}:3^5 =$ → Falso

d) $3^{-4} \cdot 3^5 =$ Falso

$$\frac{1^4}{3^4} \cdot \frac{3^5}{1^1} = \frac{3^0}{3^5} = 3^{-5}$$

e) $\frac{7^{-2}}{7^{-5}} = 7^{-3}$ Falso

$$\frac{\frac{1^2}{7^2}}{\frac{1^5}{7^5}} = \frac{1}{49} \cdot \frac{16.807}{1} \quad \frac{7^3}{7^3} = \frac{1}{343}$$

f) $\frac{5^2}{5^{-6}} = 5^8$ Verdadeiro

$$\frac{\frac{5^2}{1^6}}{\frac{1}{5^6}} \quad \frac{5^2}{1^1} \cdot \frac{5^6}{1^6} \quad 5^{2+6} = 5^8$$

-5^6

15) a) $(a^{-2} \cdot b^3)^{-2} \cdot (a^3 \cdot b^{-2})^3$

$a^4 \cdot b^{-6} \cdot a^9 \cdot b^{-6} = a^{13} \cdot b^{-12}$

b) $\dfrac{(a^5 \cdot b^3)^2}{(a^{-4} \cdot b)^{-3}} = \dfrac{a^{10} \cdot b^6}{a^{12} \cdot b^{-3}} = a^{-2} \cdot b^{6-(-3)}$

$= a^{-2} \cdot b^9$

c) $[(a^2 \cdot b^{-3})^2]^{-3} = (a^2 \cdot b^{-3})^{-6}$

$(a^2 \cdot b^{-3})^{-6} = a^{-12} \cdot b^{18}$

d) $\left(\dfrac{a^3 \cdot b^{-4}}{a^{-2} \cdot b^2}\right)^3 = \dfrac{a^9 \cdot b^{-12}}{a^{-6} \cdot b^6} = a^{9-(-6)} \cdot b^{-12-6}$

$a^{15} \cdot b^{-18}$

16) $(a^{2n+1} \cdot a^{7-n} \cdot a^{3-n})$

76| $(a^{2n+1} \cdot a^{1-n} \cdot a^{3-n})$

$a^{n+2} \cdot a^{3-n} = a^5$

Propriedade da soma

b| $\frac{a^{2n+3} \cdot a^{n-1}}{a^{2(n-1)}} = \frac{a^{3n+2}}{a^{2n-2}} = a^{3n+2-(2n-2)}$

a^{n+4}

c| $\frac{a^{2(n+1)} \cdot a^{3-n}}{a^{1-n}} = \frac{a^{2n+2} \cdot a^{3-n}}{a^{1-n}}$

Propriedade da soma

$\frac{a^{n+5}}{a^{1-n}} = a^{n+5-(1-n)} = a^{2n+4}$

d| $\frac{a^{n+4} - a^3 \cdot a^n}{a^4 \cdot a^n} = \frac{a^{n+4} - a^{n+3}}{a^{n+4}} =$

$a^{n+3} \cdot \left[\frac{a^{n+4}}{a^{n+3}} - \frac{a^{n+3}}{a^{n+3}}\right] = \frac{a^{n+3} \cdot (a-1)}{a^{n+4}} = \frac{a \cdot 1}{a}$

• COLOCAR EM EVIDÊNCIA

(Clicar no fechado lá em cima para copiar link)

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• Exercícios

17 | a | $\sqrt[3]{27} = 3$ → Verdadeiro

b | $\sqrt{4} = \pm 2$ → Falso ($\sqrt{4} = 2$)

c | $\sqrt[4]{1} = 1$ → Verdadeiro

d | $-\sqrt{9} = -3$ → Verdadeiro

e | $\sqrt[3]{\frac{1}{8}} = \frac{1}{2}$ → Verdadeiro

f | $\sqrt[3]{0} = 0$ → Verdadeiro

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18 | a | $\sqrt{x^2} = x$ → Verdadeiro

18) a) $\sqrt{x^4} = x^2$ → Verdadeira

b) $\sqrt{x^{10}} = x^5$ → Falso

c) $\sqrt{x^6} = x^3$ → Verdadeira

d) $\sqrt{(x-7)^2} = x-7$ → Verdadeira

e) $\sqrt{(x-3)^2} = 3-x$ → Verdadeira

20) a) $(x+2)^2 = \sqrt{(x+2)^2}$

$\sqrt{(x+2)^2} = |x+2|$

b) $\sqrt{(2x-3)^2} = |2x-3|$

c) $\sqrt{x^2-6x+9} = \sqrt{(x-3)^2}$

$\sqrt{x^2-6x+9} = |x-3|$

- Equação exponencial: