nivelando - resolução

POTENCIAÇÃO

01. a) $(-4)^2 = (-4).(-4) = 16$

b) $(-2)^3 = (-2).(-2).(-2) = -8$

c) $(-3)^4 = (-3).(-3).(-3).(-3) = 81$

d) $(-67)^0 = 1$

e) $(92)^1 = 92$

f) $(9)^{\frac{1}{2}} = \sqrt[2]{9^1} = \sqrt{9} = 3$

g) $(16)^{-2} = \left(\frac{1}{16^2}\right) = \frac{1}{256}$

02. a) $(-2)^4 . 4^3 =$
$= 16 . 64 =$
$= 1024$

b) $(-5)^3 + 125 =$
$= -125 + 125 =$
$= 0$

c) $2^5 : 4 =$
$= 2^5 : 2^2 =$
$= 2^{5-2} = 2^3 = 8$

d) $(-8)^3 . (-8)^7 =$
$= (-8)^{10} = 8^{10} =$
$= (2^3)^{10} = 2^{30}$

e) $5^2 . 5^8 =$
$= 5^{2+8} = 5^{10}$

f) $[(+4)^5]^2 =$
$4^{5.2} = 4^{10} =$
$= (2^2)^{10} = 2^{20}$

03. a) $\left(\frac{1}{4}\right)^{-2} = 4^2 = 16$

b) $\left(\frac{1}{7}\right)^{-3} = 7^3 = 343$

c) $\left(\frac{1}{36}\right)^{0,5} = 36^{1/2} = \sqrt[2]{36^1} = 6$

d) $\left(\frac{1}{9}\right)^3 = \frac{1^3}{9^3} = \frac{1}{729} = 729^{-1}$

e) $\left(\frac{1}{4}\right)^{0,5} = \left(\frac{1}{4}\right)^{1/2} = \sqrt{\frac{1}{4}} = \frac{1}{2}$

$\left(\frac{4}{64}\right) = \left(\frac{1}{16}\right)$ $\sqrt[2]{\frac{1}{16}} = \frac{1}{4}$

f) $\left(\frac{8}{4}\right)^3 = 2^3 = 8$

g) $3^1 = 3$

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

i) $(0,2)^3 = \left(\frac{2}{10}\right)^3 = \left(\frac{1}{5}\right)^3 = \frac{1^3}{5^3} = \frac{1}{125}$ ou $0,008$

j) $\left(-\frac{4}{5}\right)^0 = 1$

k) $\left(\frac{1}{10}\right)^3 = \frac{1}{1000}$

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

m) $-2^3 = -8$

n) $(-5)^2 = 25$

o) $(-3)^3 = -27$

04. $(0,2)^3 + (0,16)^2 =$

$= 0,008 + 0,0256 =$

$= 0,0336$

B

05. 100 000 000 000

10^{11}

C

06. a) $[(-4)^2]^3 =$

$= (-4)^{2\times3} =$

$= (-4)^6 = 4096$

b) $[(+5)^3]^4 =$

$= (+5)^{12} =$

$= 5^{12}$

c) $[(-3)^3]^2 =$

$= (-3)^6 =$

$= 729$

d) $[(-7)^3]^3 =$
$= (-7)^9$

e) $[(+2)^4]^5 =$
$= 2^{20}$

f) $[(-7)^5]^3 =$
$= (-7)^{15}$

07. 4129 000 toneladas → 4129 000 000 quilogramas
↓
$4{,}129 \cdot 10^9$

C

08. a) $(-12)^6 \cdot (-12)^2 =$
$= (-12)^8 = 12^8$

b) $(-0{,}5)^7 \cdot (-0{,}5) \cdot (-0{,}5)^8 =$
$= (-0{,}5)^{7+1+8} = (-0{,}5)^{16} =$
$= 0{,}5^{16}$

c) $2^9 : 2^5 = 2^{9-5} = 2^4$

d) $(1{,}9)^{11} \cdot (1{,}9)^{93} = (1{,}9)^{11+93} = (1{,}9)^{104}$

e) $(3^2 \cdot 3^5) : 3^8 = 3^7 : 3^8 = 3^{7-8} = 3^{-1}$

09. a) $(-3)^6 : (-3)^2 = (-3)^4 = 3^4$

b) $(+4)^{10} : (+4)^3 = (+4)^7 = 4^7$

c) $(-5)^6 : (-5)^2 = (-5)^4 = 5^4$

d) $(+3)^9 : (+3)^1 = (+3)^8 = 3^8$

e) $(-2)^7 : (-2)^5 = (-2)^2 = 2^2$

f) $(-3)^6 : (-3)^1 = (-3)^5$

10. 325 000 Km
↳ $3{,}25 \cdot 10^5$ Km

D

11. $\dfrac{6\ 10^{-5}}{10^{-9}} = 6 \cdot 10^{-5-(-9)} = 6 \cdot 10^{-5+9} = 6 \cdot 10^4$

D

12. $\frac{2^x \cdot 4}{4^x} = \frac{1}{64}$

$\frac{2^x \cdot 2^2}{(2^2)^x} = \frac{1}{2^6}$

$\frac{2^{2+x}}{2^{2x}} = \frac{1}{2^6}$

$2^{2+x} \cdot 2^6 = 2^{2x}$

$2^{2+x+6} = 2^{2x}$

$2^{8+x} = 2^{2x}$ → $2x = 8 + x$

$2x - x = 8$

$x = 8$

E

13. PIB em 2000 = x

PIB em 2010 = $x \cdot \left(\frac{104}{100}\right)^{10} =$ (÷4 / ÷4)

$= x \cdot \left(\frac{26}{25}\right)^{10} =$

B

$\frac{x \cdot 26^{10}}{25^{10}} = x \cdot \frac{b}{c}$

14. $\left[(8^2)^2\right]^2 = 8^{2 \times 2 \times 2}$

$\sqrt[3]{8^{2 \times 2 \times 2}}$

B

15. 16,5 cm → 60 m

x → 1 m

$x = \frac{16,5}{60}$ cm

$\frac{16,5}{60}$ cm → 1 m

$\frac{\frac{16,5}{60}}{100}$ m → 1 m

$v = \frac{16,5}{60 \cdot 100} = 16,5 \cdot 60^{-1} \cdot 10^{-2}$

B