01. Encontre os valores das dízimas periódicas a seguir em forma de fração irredutível.

a) 0,1037

b) 0,020

c) 1,833…

d) 0,285714285714…

e) 1,666666…

f) 3,151515...

g) 0,326363...

h) 5,54666...

02. Resolva as operações abaixo:

a) $\left(\dfrac{1}{2}-\dfrac{1}{3}\right)-\left(\dfrac{1}{6}-\dfrac{1}{10}\right)$

b) $\dfrac{1}{2}-\left(\dfrac{1}{4}-\dfrac{1}{8}\right)$

c) $\left(\dfrac{1}{2}-\dfrac{1}{4}\right)-\dfrac{1}{8}$

d) $\left(\dfrac{1}{2}-\dfrac{5}{2}\right)\cdot\left(\dfrac{9}{4}+\dfrac{8}{5}\right)$

e) $\dfrac{4}{5}\cdot\dfrac{3}{7}$

f) $\dfrac{6}{7}\cdot\dfrac{5}{3}$

g) $\dfrac{2}{5}:\dfrac{8}{7}$

h) $\dfrac{7}{9}:\dfrac{3}{16}$

i) $\dfrac{\dfrac{1}{2}}{\dfrac{2}{5}-1+\dfrac{2}{3+\dfrac{1}{2}}}$

j) $\left(\dfrac{2}{9}-\dfrac{8}{15}\right):\dfrac{4}{10}$

k) $\left(2-\dfrac{1}{3}\right)^{2}:\left(\dfrac{1}{2}-1\right)^{3}$

l) $2\cdot\dfrac{3}{4}+\dfrac{5}{12}$

m) $\left(\dfrac{1}{4}+\dfrac{1}{2}\right):\left(\dfrac{3}{2}+3\right)$

n) $\left(\dfrac{1}{2}-\dfrac{1}{6}\right):\left(\dfrac{1}{3}-\dfrac{1}{4}\right)$

o) $4,013+10,182$

p) $242,12-724,96$

q) $3,9\cdot8,2$

r) $26,45:5$

s) $2,315\cdot6$

t) $58,24:2,1$

u) $320000\cdot0,00002$

v) $3\cdot2,5-1,5$

w) $3,5\cdot4-0,8$

x) $8,36:2-1,03$

y) $8,7-1,5:0,3$

z) $\dfrac{2\cdot0,05^{2}-3\cdot0,05}{0,5+2\cdot0,05}$

03. Utilizando as propriedades de Potenciação, reduza a um só potência as seguintes expressões:

a) $\dfrac{\dfrac{1024^2 \cdot 256^3}{128^3}}{64^5 \cdot 2048^2}$

b) $\dfrac{243^4 \cdot 2187^2}{81^4 \cdot 729^3}$

c) $\dfrac{\left(\dfrac{343^4}{2401^2}\right) \cdot 16807^2}{117649^2}$

04. Simplifique as frações:

a) $\dfrac{2}{3+\dfrac{1}{4}} + \left(\dfrac{1}{\dfrac{1}{2}}\right)^2$

b) $\dfrac{\dfrac{1}{6}}{2-\dfrac{1}{4}} + \dfrac{1}{3}$

c) $\left(\dfrac{\dfrac{1}{2}+\dfrac{1}{3}+\dfrac{1}{6}}{\dfrac{1}{2}+\dfrac{2}{3}}\right)^2 + \dfrac{13}{49}$

d) $\dfrac{5}{6} + \dfrac{5}{6} \div \left(\dfrac{37}{7+\dfrac{7}{3}\times\dfrac{6}{35}}\right)$

05. Calcule as potências e simplifique-as quando possível:

a) $(3)^0$

b) $(-1)^{12}$

c) 0^{23}

d) $\left(\dfrac{6}{10}\right)^{-3}$

e) $(-0,6333...)^2$

f) $(-2)^9$

g) $\dfrac{\left(\dfrac{3a^2b}{x^3y^3}\right)^2}{\left(\dfrac{3ab^2}{2x^2y^2}\right)^3}$

h) $\left(-\dfrac{1}{3x^2}\right)^{-4}$

06. Qual a forma simplificada das raízes?

a) $\sqrt{3}+\sqrt{12}-\sqrt{27}+\sqrt{867}$

b) $\sqrt[3]{\dfrac{14}{125}}+\sqrt{\dfrac{3}{5}-\dfrac{11}{25}}$

c) $\sqrt{\dfrac{x}{\sqrt[3]{x}}}$

d) $\sqrt{8+\sqrt{14+\sqrt[3]{6+\sqrt{4}}}}$

07. Dê o resultado simplificado em notação científica das seguintes operações:

a) $2,0\times10^{-5}\cdot7,325\times10^{2}$

b) $\dfrac{0,982\times10^{-7}}{0,1964\times10^{-3}}$

c) $\dfrac{2\times10^{6}\cdot1,5\times10^{3}}{1,2\times10^{2}\cdot2,5\times10^{-2}}$

08. Indique as questões verdadeiras e falsas, justifique a sua resposta.

a) $4^{a+2}=4^{a}\cdot16$

b) $\left(-5\cdot x^{2}\right)^{3}=25\cdot x^{6}$

c) $3^{y-3+x}=\dfrac{3^{y}\cdot3^{x}}{27}$

d) $\dfrac{\left(\sqrt[3]{2}\right)^{12}}{\left(\sqrt[3]{8}\right)^{5}}=\dfrac{1}{4}$

e) $\sqrt[4]{-16}=2$

f) $\sqrt[n]{y\cdot x^{n}}=x\cdot\sqrt[n]{y}$

g) $\sqrt{0,111...}=\dfrac{1}{9}$

09. Escreva na forma de potência com expoente fracionário:

a) $\sqrt{3}$

b) $\sqrt[3]{4}$

c) $\sqrt[6]{7^{5}}$

d) $\dfrac{3}{\sqrt[7]{2^{3}}}$

e) $\dfrac{1}{\sqrt[5]{x^{4}}}$

10. Reduza os radicais aos mesmos índices:

a) $\sqrt{3}$ e $\sqrt[5]{3^{2}}$

b) $\sqrt[3]{a},\ \sqrt{ab}$ e $\sqrt[4]{2a^{3}}$

11. Racionalize os denominadores a seguir:

a) $\dfrac{3}{\sqrt{5}}$

b) $\dfrac{10}{\sqrt[5]{6^2}}$

c) $\dfrac{7}{5\sqrt{2}}$

d) $\dfrac{2}{\sqrt[4]{a^3}}$, para $a > 0$

e) $\dfrac{3}{\sqrt{5} - \sqrt{2}}$

f) $\dfrac{5\sqrt{2}}{\sqrt{8} + \sqrt{3}}$

g) $\dfrac{\sqrt{5}}{\sqrt{5} - 1}$

12. Encontre o valor das seguintes expressões:

a) $\left(2\sqrt{8} + 3\sqrt{5} - 6\sqrt{2}\right) - \left(\sqrt{72} + \sqrt{20} - 4\sqrt{2}\right)$

b) $\left(\sqrt{(-5)^2} + \dfrac{1}{0,444...}\right)^{-\frac{1}{2}} \cdot \dfrac{3}{\sqrt[4]{2^{16}}}$

c) $\left[\left(\dfrac{5}{3}\right)^{-2}\right]^{1,5} \cdot 0,8^2$

d) $8 \cdot \sqrt[3]{10^{-3}} \cdot 5 \cdot 10^{-3}$

e) $\left(125^{\frac{2}{3}} + 16^{\frac{1}{2}} + 343^{\frac{1}{3}}\right)^{\frac{1}{2}}$

13. Resolva as expressões numéricas:

a) $10^2 \times \left\{10^{-1} \div \left[6 \div \sqrt[4]{81} - (7 - 18)\right]\right\}$

b) $(60 \div 2) \div \left\{\left(9^2 + \sqrt{25}\right) + \left[(-3)^2 - 5 \times \left(13^2 - 50\right)\right] - 20^2\right\}$

c) $(-16)^2 - \left\{(45 - 19) - \left[(18 - 3) + 3 \times (28 - 15)\right] - \sqrt{256}\right\}$

d) $4^4 - \left[60 - 3 + (15 \times 5 + 1)^2 - \left(\sqrt{49} - \sqrt{25}\right)^2\right]$

RESPOSTAS

1.

a) $\dfrac{1037}{10000}$ d) $\dfrac{10582}{37037}$ g) $\dfrac{359}{1100}$

b) $\dfrac{1}{50}$ e) $\dfrac{5}{3}$ h) $\dfrac{416}{75}$

c) $\dfrac{11}{6}$ f) $\dfrac{104}{33}$

2.

a) $\dfrac{1}{10}$ h) $\dfrac{112}{27}$ p) $-482,84$

q) $31,98$

b) $\dfrac{3}{8}$ i) $-\dfrac{35}{2}$ r) $5,29$

s) $13,89$

c) $\dfrac{1}{8}$ j) $-\dfrac{7}{9}$ t) $27,7333...$

d) $-\dfrac{77}{10}$ k) $-\dfrac{200}{9}$ u) $6,4$

v) 6

e) $\dfrac{12}{35}$ l) $\dfrac{23}{12}$ w) $13,2$

x) $3,15$

f) $\dfrac{10}{7}$ m) $\dfrac{1}{6}$ y) $3,7$

n) 4 z) $-0,241666...$

g) $\dfrac{7}{20}$

o) $14,195$

3.

a) 2^{-29} b) 1 c) 7^2

4.

a) $\dfrac{60}{13}$ b) $\dfrac{3}{7}$ c) 1   d) 1

5.

a) 1   c) 0   e) $\dfrac{361}{900}$ g) $\dfrac{8a}{3b^4}$

b) 1   d) $\dfrac{125}{27}$ f) -512 h) $81x^8$

6.

a) $17\sqrt{3}$ b) $\dfrac{4}{5}$ c) $x^{\frac{1}{3}}$ d) $2\sqrt{3}$

7.

a) $1,465 \times 10^{-2}$ b) $5,0 \times 10^{-4}$ c) $1,0 \times 10^{9}$

8.

a) V   e) F, pois $-16 < 0$ (não existe raiz real)

b) F, pois $\left(-125x^6\right)$ f) V

c) V   g) F, pois $\dfrac{1}{3}$

d) F, pois $\dfrac{1}{2}$

9.

a) $3^{\frac{1}{2}}$ d) $3 \cdot \left(2^{-\frac{3}{7}}\right)$

b) $2^{\frac{2}{3}}$

c) $7^{\frac{5}{6}}$ e) $x^{-\frac{4}{5}}$

10.

a) $\sqrt[10]{3^5}$ e $\sqrt[10]{3^4}$

b) $\sqrt[12]{a^4}$, $\sqrt[12]{a^6b^6}$ e $\sqrt[12]{8a^9}$

11.

a) $\dfrac{3\sqrt{5}}{5}$

b) $\dfrac{5\sqrt[5]{6^3}}{3}$

c) $\dfrac{7\sqrt{2}}{10}$

d) $\dfrac{2\sqrt[4]{a}}{a}$

e) $\sqrt{5}+\sqrt{2}$

f) $4-\sqrt{6}$

g) $\dfrac{5+\sqrt{5}}{4}$

12.

a) $\sqrt{5}-4\sqrt{2}$

b) $\dfrac{3\sqrt{29}}{232}$

c) $\dfrac{432}{3125}$

d) $\dfrac{1}{250}$

e) 6

13.

a) $\dfrac{10}{13}$

b) $-\dfrac{1}{30}$

c) 300

d) -5573