

Aluno _____

Turma _____

Caderno de Estudos 2 - 8ª Série Entrega até 27/04



1.

Escreva os radicais na forma de expoente fracionário.

a) $\sqrt{3} = 3^{\frac{1}{2}}$

d) $\sqrt[4]{x^2} = x^{\frac{2}{4}}$

b) $\sqrt[3]{7} = 7^{\frac{1}{3}}$

e) $\sqrt[6]{am} = (am)^{\frac{1}{6}}$

c) $\sqrt[4]{(2a)^3} = (2a)^{\frac{3}{4}}$

f) $\sqrt[3]{(a+b)^4} = (a+b)^{\frac{4}{3}}$

2.

Escreva na forma de radicais as potências com expoente fracionário.

a) $\frac{1}{3^2} = \sqrt{3}$

d) $\frac{3}{x^6} = \sqrt[6]{x^3}$

b) $(5a)^{\frac{2}{3}} = \sqrt[3]{(5a)^2}$

e) $(x+y)^{\frac{5}{3}} = \sqrt[3]{(x+y)^5}$

c) $4^{1.5} = 4^{\frac{3}{2}} = 2\sqrt{4^3}$

f) $a^{0.4} = a^{\frac{4}{10}} = \sqrt[10]{a^4}$

5.

Transforme o radical de um produto num produto de dois ou mais radicais.

a) $\sqrt{2 \cdot 3} = \sqrt{2} \cdot \sqrt{3}$

d) $\sqrt{3x} = \sqrt{3} \cdot \sqrt{x}$

b) $\sqrt[3]{3 \cdot 7} = \sqrt[3]{3} \cdot \sqrt[3]{7}$

e) $\sqrt{2 \cdot 3 \cdot 11} = \sqrt{2} \cdot \sqrt{3} \cdot \sqrt{11}$

c) $\sqrt[5]{2 \cdot x^4} = \sqrt[5]{2} \cdot \sqrt[5]{x^4}$

6.

Transforme o radical de um quociente num quociente de radicais.

a) $\sqrt{\frac{2}{5}} = \frac{\sqrt{2}}{\sqrt{5}}$

b) $\sqrt[3]{\frac{13}{7}} = \frac{\sqrt[3]{13}}{\sqrt[3]{7}}$

c) $\sqrt[4]{\frac{50}{17}} = \frac{\sqrt[4]{50}}{\sqrt[4]{17}}$

7. Aplique a propriedade de raiz de raiz:

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

c) $\sqrt[3]{\sqrt{x^2}} = \sqrt[9]{x^2}$

b) $\sqrt[3]{\sqrt[4]{7}} = \sqrt[12]{7}$

d) $\sqrt[5]{\sqrt{\sqrt{ab}}} = \sqrt[20]{ab}$

8. Resolva essas operações:

a) $\sqrt{12} \cdot \sqrt{3} = \sqrt{36} = 6$

b) $\sqrt{15} \cdot \sqrt{3} = \sqrt{45} = 3\sqrt{5}$

c) $8\sqrt{2} \cdot 3\sqrt{5} = 24\sqrt{10}$

d) $9\sqrt{7} \cdot 2\sqrt{7} = 18 \cdot 7 = 126$

e) $\frac{\sqrt{27}}{\sqrt{3}} = \sqrt{\frac{27}{3}} = \sqrt{9} = 3$

f) $\sqrt{\frac{81}{9}} = \sqrt{9} = 3$

g) $20\sqrt{10} \div 5\sqrt{2} = 4\sqrt{5}$

h) $\frac{\sqrt{500}}{\sqrt{10}} = \sqrt{50}$

9. Simplifique as expressões com radicais:

a) $\sqrt[3]{\sqrt{a}} = \sqrt[6]{a}$	b) $\sqrt[3]{(xy)^{20}} = \sqrt[3]{(xy)^2}$
c) $\sqrt[5]{10^9} = \sqrt[5]{10^3}$	d) $\sqrt[3]{64} = \sqrt[3]{2^6} = \sqrt{2}$
e) $\sqrt{x} \cdot \sqrt[3]{x^7} = \sqrt[6]{x^8} = \sqrt[3]{x^2}$	f) $\sqrt{y} \cdot \sqrt[3]{y} \cdot \sqrt[3]{y} = \sqrt[6]{y^3} = \sqrt{y}$
g) $\sqrt[3]{\sqrt{a^3}} = \sqrt[6]{a^3} = \sqrt{a}$	h) $\sqrt{5^3} = \sqrt[3]{5^2 \cdot 5} = 5\sqrt{5}$

i) $\sqrt[4]{2^9} = 4\sqrt[4]{2^4 \cdot 2^1} = 4\sqrt[4]{2}$	j) $\sqrt{200} = \sqrt{2^3 \cdot 2 \cdot 5^2} = 10\sqrt{2}$
l) $\sqrt[3]{162} = 3\sqrt[3]{3^3 \cdot 3 \cdot 2} = 3\sqrt[3]{6}$	m) $\sqrt[3]{2^3 \cdot a^3 \cdot b^2} = 2a \cdot \sqrt[3]{b^2}$
n) $\sqrt[5]{2048} = 5\sqrt[5]{2^{11}} = 5\sqrt[5]{2^5 \cdot 2^5 \cdot 2} = 4\sqrt[5]{2}$	o) $\sqrt[6]{384} = 6\sqrt[6]{2^6 \cdot 2 \cdot 3} = 2\sqrt[6]{6}$

10.

Determine as somas algébricas, escrevendo-as na sua forma mais simples.

a) $11\sqrt{3} - 9\sqrt{3} + \sqrt{3} = 3\sqrt{3}$

d) $9 + 6\sqrt{7} - 11\sqrt{7} - 5 = 4 - 5\sqrt{7}$

b) $3\sqrt{y} + 5\sqrt{y} - 8\sqrt{y} = 0$

e) $2\sqrt{a} + 8\sqrt{b} - 6\sqrt{a} + 5\sqrt{b} = 13\sqrt{b} - 4\sqrt{a}$

c) $2\sqrt[3]{7} + 12\sqrt[3]{7} - \sqrt[3]{7} - 2\sqrt[3]{7} = 11\sqrt[3]{7}$

f) $7x\sqrt{ab} - 5x\sqrt{ab} - x\sqrt{ab} = x\sqrt{ab}$

11. Efetue as multiplicações e divisões, deixando o resultado o mais simples possível:

a) $\sqrt{5}(\sqrt{5} - 3\sqrt{3}) = 5 - 3\sqrt{15}$	b) $\sqrt{5} \cdot \sqrt{4} = \sqrt{20}$
c) $(\sqrt{3} - \sqrt{5})(\sqrt{3} + \sqrt{5}) = 3 - 5 = -2$	d) $\sqrt[3]{a^3} \cdot \sqrt[4]{a^4} = a^{\frac{3}{4}} \cdot a^{\frac{4}{5}} = a^{\frac{21}{20}} = \sqrt[20]{a^{21}} = a^{\sqrt[20]{a}}$ $\frac{3}{4} + \frac{4}{5} = \frac{15+16}{20} = \frac{21}{20}$

e) $-5\sqrt{2} \cdot 3\sqrt{2} =$ $-15 \cdot 2 = -30$	f) $\sqrt[3]{2^3} : \sqrt{2} = 2^{\frac{3}{3}} : 2^{\frac{1}{2}} = 2^{\frac{1}{2}}$ $\frac{2}{3} - \frac{1}{2} = \frac{4-3}{6} = \frac{1}{6}$ $\sqrt[6]{2}$
g) $\frac{\sqrt{100}}{\sqrt{5}} = \sqrt{\frac{100}{5}} = \sqrt{20} = 2\sqrt{5}$	

12. Complete com V ou F:

(F) $\sqrt{6} \cdot \sqrt{6} = \sqrt{12}$

(V) $\sqrt{3} \cdot \sqrt{3} = \sqrt{9}$

(F) $\sqrt{12} = 3\sqrt{2}$

(F) $\sqrt{5} + 5\sqrt{5} = 5\sqrt{5}$

(V) $\sqrt{3} \cdot \sqrt[3]{2} = \sqrt[3]{108}$

(V) $2\sqrt{3} \cdot 4\sqrt{2} = 8\sqrt{6}$

(F) $(2 + \sqrt{2}) \cdot (2 - \sqrt{2}) = 0$

(F) $\sqrt[3]{x} + \sqrt[3]{y} = \sqrt[3]{x+y}$

(V) $\sqrt{\sqrt[3]{x}} = \sqrt[3]{x}$

13. Insira o fator externo no radical e simplifique, se possível:

a) $2x\sqrt{x} = \sqrt{2^2 x^2 x} = \sqrt{4x^3}$	b) $3b\sqrt[3]{2ab} = \sqrt[3]{3^3 b^3 2ab} = \sqrt[3]{54a^2 b^4}$
c) $5\sqrt{3} = \sqrt{5^2 \cdot 3} = \sqrt{75}$	d) $6\sqrt[3]{5} = \sqrt[3]{6^3 \cdot 5} = \sqrt[3]{1080}$
e) $10\sqrt[5]{6} = \sqrt[5]{10^5 \cdot 6} = \sqrt[5]{600000}$	f) $2a\sqrt[3]{6} = \sqrt[3]{2^3 a^3 6} = \sqrt[3]{48a^3}$

14. Calcule:

a) $\sqrt{7 + \sqrt[3]{5 + \sqrt{6 + \sqrt{9}}}} =$ $\sqrt{7 + \sqrt[3]{5 + 19}} =$ $\sqrt{7 + \sqrt[3]{24}} = \sqrt{7 + 2} = \sqrt{9} = 3$	b) $\sqrt{\sqrt{16}} + \sqrt{\sqrt[3]{1}} =$ $\sqrt[4]{16} + \sqrt[6]{1} =$ $2 + 1 = 3$
c) $\sqrt{13 + \sqrt[3]{24 + \sqrt{5 + \sqrt{16}}}} =$ $\sqrt{13 + \sqrt[3]{24 + 19}} =$ $\sqrt{13 + \sqrt[3]{43}} = \sqrt{13 + 3} = 4$	d) $\sqrt{\sqrt{81}} + \sqrt{\sqrt[3]{1}} =$ $\sqrt[4]{81} + \sqrt[6]{1} =$ $3 + 1 = 4$

15. Calcule, deixando o resultado o mais simples possível:

a) $4\sqrt{2} + 3\sqrt{2} - 5\sqrt{2} =$ $2\sqrt{2}$	b) $\sqrt{3} + 3\sqrt{5} - 2\sqrt{3} - 4\sqrt{5} =$ $-\sqrt{3} - \sqrt{5}$
c) $\sqrt{32} - \sqrt{8} - \sqrt{50} + \sqrt{72} =$ $\sqrt{2^2 \cdot 2^2 \cdot 2} - \sqrt{2^2 \cdot 2} - \sqrt{5^2 \cdot 2} + \sqrt{2^2 \cdot 2^2 \cdot 3}$ $4\sqrt{2} - 2\sqrt{2} - 5\sqrt{2} + 6\sqrt{2} = 3\sqrt{2}$	d) $3\sqrt{20} - \sqrt{45} + 2\sqrt{80} =$ $3\sqrt{2^2 \cdot 5} - \sqrt{3^2 \cdot 5} + 2\sqrt{2^2 \cdot 2^2 \cdot 5}$ $6\sqrt{5} - 3\sqrt{5} + 8\sqrt{5} = 11\sqrt{5}$
e) $\sqrt{50} + 4\sqrt{18} - 6\sqrt{2} =$ $\sqrt{5^2 \cdot 2} + 4\sqrt{3^2 \cdot 2} - 6\sqrt{2}$ $5\sqrt{2} + 12\sqrt{2} - 6\sqrt{2} = 11\sqrt{2}$	f) $3\sqrt{125} - 3\sqrt{27} + 4\sqrt{20} + 4\sqrt{12} =$ $3\sqrt{5^2 \cdot 5} - 3\sqrt{3^2 \cdot 3} + 4\sqrt{2^2 \cdot 5} + 4\sqrt{2^2 \cdot 3}$ $15\sqrt{5} - 9\sqrt{3} + 8\sqrt{5} + 8\sqrt{3} =$ $23\sqrt{5} - \sqrt{3}$
g) $2\sqrt{8} + 5\sqrt{18} - 2\sqrt{50} + 7\sqrt{32} =$ $2\sqrt{2^2 \cdot 2} + 5\sqrt{3^2 \cdot 2} - 2\sqrt{5^2 \cdot 2} + 7\sqrt{2^2 \cdot 2^2}$ $4\sqrt{2} + 15\sqrt{2} - 10\sqrt{2} + 28\sqrt{2} = 37\sqrt{2}$	h) $\sqrt{125} + 2\sqrt{27} - \sqrt{20} + 3\sqrt{12} =$ $\sqrt{5^2 \cdot 5} + 2\sqrt{3^2 \cdot 3} - \sqrt{2^2 \cdot 5} + 3\sqrt{2^2 \cdot 3}$ $5\sqrt{5} + 6\sqrt{3} - 2\sqrt{5} + 6\sqrt{3} =$ $3\sqrt{5} + 12\sqrt{3}$
i) $2\sqrt{20} + 3\sqrt{32} - 4\sqrt{45} + 10\sqrt{50} =$ $2\sqrt{2^2 \cdot 5} + 3\sqrt{2^2 \cdot 2^2 \cdot 2} - 4\sqrt{3^2 \cdot 5} + 10\sqrt{5^2 \cdot 2}$ $4\sqrt{5} + 12\sqrt{2} - 12\sqrt{5} + 50\sqrt{2} =$ $-8\sqrt{5} + 62\sqrt{2}$	j) $\sqrt{12} - \sqrt{75} + \sqrt{3} =$ $\sqrt{2^2 \cdot 3} - \sqrt{5^2 \cdot 3} + \sqrt{3}$ $2\sqrt{3} - 5\sqrt{3} + \sqrt{3} = -2\sqrt{3}$

Espaço para fatorações!!!!

$$\begin{array}{r} 32 \mid 2 \\ 16 \mid 2 \\ 8 \mid 2 \\ 4 \mid 2 \\ 2 \mid 2 \\ 1 \end{array}$$

$$\begin{array}{r} 72 \mid 2 \\ 36 \mid 2 \\ 18 \mid 2 \\ 9 \mid 3 \\ 3 \mid 3 \\ 1 \end{array}$$

$$\begin{array}{r} 45 \mid 5 \\ 9 \mid 3 \\ 3 \mid 3 \\ 1 \end{array}$$

$$\begin{array}{r} 12 \mid 2 \\ 6 \mid 2 \\ 3 \mid 3 \\ 1 \end{array}$$

$$\begin{array}{r} 50 \mid 2 \\ 25 \mid 5 \\ 5 \mid 5 \\ 1 \end{array}$$

$$\begin{array}{r} 20 \mid 2 \\ 10 \mid 2 \\ 5 \mid 5 \\ 1 \end{array}$$

$$\begin{array}{r} 80 \mid 2 \\ 40 \mid 2 \\ 20 \mid 2 \\ 10 \mid 2 \\ 5 \mid 5 \\ 1 \end{array}$$

$$\begin{array}{r} 75 \mid 3 \\ 25 \mid 5 \\ 5 \mid 5 \\ 1 \end{array}$$

Bom Estudo!!!