

Pre-Calculus 11 - VLN

Chapter 5: Radicals

Lesson 4: Multiplying and Dividing Radicals

Question #1

Reference Q.20483

Multiply each of the following and simplify:

a. $\sqrt{3} \times \sqrt{5}$

b. $\sqrt{7} \times \sqrt{3}$

c. $2\sqrt{3} \times 4\sqrt{10}$

d. $-5\sqrt{2} \times \sqrt{6}$

Question #2

Reference Q.20484

Multiply each of the following and simplify:

a. $\sqrt{12} \div \sqrt{4}$

b. $\sqrt{24} \div \sqrt{6}$

c. $\frac{6\sqrt{18}}{3\sqrt{9}}$

d. $\frac{15\sqrt{26}}{3\sqrt{2}}$

Question #3

Reference Q.14446

Simplify the following. Write each expression as a power with positive exponents and then as an entire radical.

a. $x^{\frac{7}{2}} \times x$

b. $y^{\frac{6}{5}} \times y^{\frac{4}{5}}$

c. $(a^{\frac{2}{5}})^{\frac{3}{4}}$

d. $(e^3 f)^{\frac{3}{2}}$

e. $x^{\frac{1}{2}} \times x^{-1}$

f. $y^{\frac{2}{7}} \div y^{\frac{5}{7}}$

g. $\left(\frac{x}{y^4}\right)^{\frac{1}{2}}$

h. $\left(\frac{x^2}{y}\right)^{-\frac{3}{2}}$

Question #4

Reference Q.14448

Simplify the following. Write each expression as a power with positive exponents and then as an entire radical.

a. $2x^{\frac{3}{8}} \times 5x^{-\frac{1}{8}}$

b. $64(a^{\frac{1}{2}})^{\frac{1}{3}}$

c. $((64a)^{\frac{1}{3}})^{\frac{1}{2}}$

d. $(64a^{\frac{1}{3}})^{\frac{1}{2}}$

e. $\frac{y^{\frac{2}{3}}y^{\frac{1}{2}}}{y^{\frac{1}{4}}}$

f. $\frac{a^3b^{\frac{1}{2}}}{b^3(a^{\frac{3}{2}})^2}$

g. $\frac{10x^{-\frac{3}{5}}}{5x^{\frac{1}{5}}}$

h. $\frac{(a^4)^{\frac{1}{3}}}{9} \div \frac{a}{81^{\frac{3}{4}}}$

Question #5

Reference Q.14501

Match each item in column 1 with the equivalent item in column 2.

Each item in column 2 may be used once, more than once, or not at all.

Column 1

$$\left(\frac{p}{q}\right)^{\frac{3}{4}}$$

$$\left(\frac{p}{q}\right)^{\frac{3}{4}}$$

$$\left(\frac{q}{p}\right)^{-\frac{4}{3}}$$

$$\left(\frac{p}{q}\right)^{-\frac{3}{4}}$$

$$\left(\frac{q}{p}\right)^{\frac{3}{4}}$$

$$\left(\frac{p}{q}\right)^{-\frac{4}{3}}$$

Column 2

$$\sqrt[4]{\frac{q^3}{p^3}}$$

$$\sqrt[4]{\frac{p^3}{q^3}}$$

$$-\sqrt[4]{\frac{p^3}{q^3}}$$

$$\sqrt[3]{\frac{p^4}{q^4}}$$

$$\sqrt[3]{\frac{q^4}{p^4}}$$

$$-\sqrt[3]{\frac{q^4}{p^4}}$$

Question #6

Reference Q.14504

For all positive integers a and b, which of the following is not equivalent to $a^3\sqrt{b}$?

A. $a^3b^{\frac{1}{2}}$

B. $(a^6b)^{\frac{1}{2}}$

C. $\sqrt{a^6b}$

D. All of the expressions are equivalent to $a^3\sqrt{b}$.

Question #7

Reference Q.20365

Given the following expressions, are we able to combine them into a single radical without changing the radical form? Explain.

a. $\sqrt{5}\sqrt{10}$

b. $\sqrt[7]{2^4}\sqrt{2}$

c. $\frac{\sqrt{3}}{\sqrt[3]{4}}$

d. $\frac{\sqrt[10]{4}}{\sqrt[10]{7}}$

Question #8

Reference Q.20366

a. What is the general rule for multiplying radicals?

b. What is the general rule for dividing radicals?

Question #9

Reference Q.20367

Multiply/Divide each of the following expressions (if possible):

a. $\sqrt{3}\sqrt{2}$

b. $\sqrt{3^4}\sqrt{2}$

c. $\frac{\sqrt[6]{5}}{\sqrt[5]{2}}$

d. $\frac{\sqrt[3]{9}}{\sqrt[3]{3}}$

Question #10

Reference Q.20368

Combine each of the following expressions into a single radical (if possible):

a. $\sqrt{3} \times (5)^{\frac{1}{2}}$

b. $(6)^3 \times \sqrt[3]{2}$

c. $\frac{\sqrt[3]{10}}{3^{10}}$

d. $\frac{2^{\frac{1}{2}}}{6^{\frac{1}{2}}}$

Question #11

Reference Q.20369

Simplify each of the following expressions as much as possible:

a. $\frac{\sqrt{2}\sqrt{10}}{\sqrt{5}\sqrt{3}}$

b. $\frac{\sqrt{8}\sqrt{2}}{\sqrt{12}\sqrt{5}}$

c. $\frac{\sqrt[4]{2}\sqrt{3}}{\sqrt{5}\sqrt[4]{8}}$

Question #12

Reference Q.20377

Rewrite the following as a single radical: $\sqrt{8}(\sqrt{20} + \sqrt{5})$

Question #13

Reference Q.20378

Rewrite the following as a single radical: $\sqrt{10}(2\sqrt{3} - \sqrt{48})$

Question #14

Reference Q.20379

Rewrite the following as a single radical: $\frac{\sqrt{7}(\sqrt{50} - \sqrt{72})}{\sqrt{14}}$

Question #15

Reference Q.20380

Rewrite the following as a single radical: $\frac{\sqrt{18}(3\sqrt{10} + 5\sqrt{10})}{\sqrt{24}}$

Question #16

Reference Q.14498

Write as a power and evaluate.

a. $\sqrt{\sqrt[3]{64}}$

b. $\frac{1}{\sqrt[4]{625}}$

c. $\sqrt{\sqrt{2401}}$

Question #17

Reference Q.14499

Write each expression in the form ax^n , where $a \in \mathbb{I}$, and $n \in \mathbb{Q}$.

a. $\sqrt[3]{27x^7}$

b. $\sqrt[4]{81x^3}$

c. $\sqrt[3]{-64x}$

d. $(\sqrt[4]{x^3})(\sqrt{x})$

e. $3\sqrt[3]{x} \times 3\sqrt[3]{x}$

f. $\left(\frac{25\sqrt[3]{x^5}}{5x^{\frac{1}{3}}}\right)^2$

Question #18

Reference Q.14599

Write a function given the following two pieces of information about a runner's time in a marathon.

1. her half-way time is 1hr. 45min.
2. A marathon is 26.2 miles.