

10.2 Rational Exponents

10.3 Simplifying Radical Expressions

Simplify the expression involving rational exponents.

1) $361^{1/2}$ A) 76 B) 19 C) 9.5 D) 38 1) _____

2) $125^{4/3}$ A) 3125 B) 15,625 C) 78,125 D) 625 2) _____

3) $(-27)^{1/3}$ A) -3 B) Not a real number 3) _____
C) -27 D) 3

4) $(-121)^{1/2}$ A) -11 B) -5.5 4) _____
C) Not a real number D) 11

Evaluate the exponential.

5) $\left(-\frac{27}{8}\right)^{-2/3}$ 5) _____
A) not a real number B) $\frac{9}{4}$
C) $-\frac{9}{4}$ D) $\frac{4}{9}$

6) $\left(\frac{36}{49}\right)^{-1/2}$ 6) _____
A) not a real number B) $\frac{18}{49}$
C) $\frac{7}{6}$ D) $\frac{6}{7}$

Write with radicals. Assume that all variables represent positive real numbers.

7) $x^{1/6}$ 7) _____
A) $\frac{1}{\sqrt[6]{x}}$ B) $\sqrt[6]{x}$ C) x^{-6} D) $\sqrt{x^6}$

8) $m^{4/3}$ 8) _____
A) $\sqrt[4]{m^3}$ B) $(\sqrt[4]{m})^3$ C) $\frac{1}{\sqrt[4]{m}}$ D) $(\sqrt[3]{m})^4$

9) $(6x)^{2/3} + (12y)^{1/4}$

9) _____

A) $(\sqrt[3]{6x})^2 + \frac{1}{(12y)^4}$

B) $(\sqrt[3]{6x})^2 + \sqrt[4]{12y}$

C) $(\sqrt{6x})^3 + \sqrt[4]{12y}$

D) $6(\sqrt[3]{x})^2 + 12\sqrt[4]{y}$

Simplify by first converting to rational exponents. Assume all variables represent positive real numbers. Give the answer in radical form.

10) $\sqrt{5^8}$

10) _____

A) $\sqrt{5^8}$

B) 3125

C) 625

D) 25

11) $\sqrt{w^{50}}$

11) _____

A) $\sqrt{w^{25}}$

B) $\sqrt{w^{50}}$

C) $w^{7.071}$

D) w^{25}

Use the rules of exponents to simplify the expression. Write the answer with positive exponents. Assume that all variables represent positive real numbers.

12) $\frac{y^{9/8}}{y^{5/8}}$

12) _____

A) $\frac{1}{y}$

B) $y^{9/8}$

C) $y^{1/2}$

D) y

13) $(b^6)^{7/6}$

13) _____

A) $b^{7/36}$

B) $b^{13/6}$

C) $b^{1/6}$

D) b^7

14) $(r^{1/6} s^{1/6})^2$

14) _____

A) $r^2 s^2$

B) $r^{1/36} s^{1/36}$

C) $r^{1/12} s^{1/12}$

D) $r^{1/3} s^{1/3}$

15) $\frac{x^{1/2}}{x^{5/4} \cdot x^{-3}}$

15) _____

A) $\frac{1}{x^{9/4}}$

B) $x^{19/4}$

C) $\frac{1}{x^{19/4}}$

D) $x^{9/4}$

Write with rational exponents, and then apply the properties of exponents. Assume all radicands represent positive real numbers. Give answer in exponential form.

16) $\sqrt[3]{x^5} \cdot \sqrt[4]{x}$

16) _____

A) $x^{23/5}$

B) $x^{20/3}$

C) $x^{5/3}$

D) $x^{23/12}$

17) $\frac{\sqrt{y^5}}{\sqrt{y^8}}$

17) _____

A) $\frac{1}{y^{3/2}}$

B) $y^{3/2}$

C) $-y^{3/2}$

D) $\frac{1}{y\sqrt{3}}$

Express in simplified form. Assume that all variables represent positive real numbers.

18) $-\sqrt[3]{1000x^4y^5}$

18) _____

A) $-10xy\sqrt[3]{xy^2}$

B) $-10xy\sqrt[3]{xy}$

C) $2xy\sqrt[3]{xy^2}$

D) $10xy\sqrt[2]{xy^2}$

19) $\sqrt[3]{-8a^8b^5}$

19) _____

A) $2ab\sqrt[3]{a^3b^3}$

B) $2ab\sqrt[3]{a^2b^2}$

C) $-2a^2b\sqrt[3]{a^2b^2}$

D) $2\sqrt[2]{a^2b^2}$

20) $\sqrt[3]{8k^{12}}$

20) _____

A) $8k^4$

B) $2k^4$

C) $2k^{15}$

D) $-2k^4$

Simplify by first writing the radicals with the same index. Then multiply.

21) $\sqrt{3} \cdot \sqrt[3]{4}$

21) _____

A) $\sqrt[6]{432}$

B) $\sqrt[6]{144}$

C) $\sqrt[6]{12}$

D) $\sqrt[6]{108}$

Answer Key

Testname: PRACTICE16A

- 1) B
- 2) D
- 3) A
- 4) C
- 5) D
- 6) C
- 7) B
- 8) D
- 9) B
- 10) C
- 11) D
- 12) C
- 13) D
- 14) D
- 15) D
- 16) D
- 17) A
- 18) A
- 19) C
- 20) B
- 21) A