

**LESSON 5.5 Skills Practice**

Name \_\_\_\_\_ Period \_\_\_\_\_

**Radical! Because It's Cliché!  
Properties of Rational Exponents****Vocabulary**

Match each definition to its corresponding term.

- |   |                     |
|---|---------------------|
| 1. the number $a$ in the expression $\sqrt[n]{a}$                 | A cube root         |
| 2. the number $b$ when $b^3 = a$                                  | B index             |
| 3. the exponent $\frac{1}{n}$ in the expression $a^{\frac{1}{n}}$ | C $n$ th root       |
| 4. the number $n$ in the expression $\sqrt[n]{a}$                 | D radicand          |
| 5. the number $b$ when $b^n = a$                                  | E rational exponent |

**Problem Set**

Write each expression as a single power.

- |  |                        |
|--|------------------------|
| 1. $\frac{10^5}{10^8}$<br>$\frac{10^5}{10^8} = 10^{5-8} = 10^{-3}$ | 2. $\frac{10^0}{10^4}$ |
| 3. $\frac{10^2}{10^5}$   | 4. $\frac{x^4}{x^9}$   |
| 5. $\frac{5^3}{5^{10}}$  | 6. $\frac{y^2}{y^8}$   |

Evaluate each expression.

7.  $\sqrt[3]{216} =$   
 $\sqrt[3]{216} = 6$

8.  $\sqrt[3]{64} =$

9.  $\sqrt[3]{-125} =$

10.  $\sqrt[3]{-343} =$

11.  $\sqrt[3]{729} =$

12.  $\sqrt[3]{-8} =$

Evaluate each expression.

13.  $\sqrt[5]{32} =$   
 $\sqrt[5]{32} = 2$

14.  $\sqrt[4]{625} =$

15.  $\sqrt[6]{729} =$

16.  $\sqrt[5]{-1024} =$

17.  $\sqrt[4]{-128} =$

18.  $\sqrt[5]{-243} =$

**5**

Write each radical as a power.

19.  $\sqrt[4]{15}$   
 $\sqrt[4]{15} = 15^{\frac{1}{4}}$

20.  $\sqrt[3]{5}$

21.  $\sqrt[3]{31}$

22.  $\sqrt[3]{x}$

23.  $\sqrt[6]{y}$

24.  $\sqrt{z}$

Name \_\_\_\_\_ Date \_\_\_\_\_

Write each power as a radical.

25.  $12^{\frac{1}{3}}$

$$12^{\frac{1}{3}} = \sqrt[3]{12}$$

26.  $7^{\frac{1}{5}}$

27.  $18^{\frac{1}{4}}$

28.  $a^{\frac{1}{2}}$

29.  $d^{\frac{1}{5}}$

30.  $c^{\frac{1}{6}}$

Write each expression in radical form.

31.  $5^{\frac{2}{3}}$

$$5^{\frac{2}{3}} = \sqrt[3]{5^2}$$

32.  $8^{\frac{2}{5}}$

33.  $18^{\frac{3}{4}}$

34.  $x^{\frac{3}{5}}$

35.  $y^{\frac{4}{3}}$

36.  $m^{\frac{5}{2}}$

Write each expression in rational exponent form.

37.  $\sqrt[4]{6^3}$   
 $\sqrt[4]{6^3} = 6^{\frac{3}{4}}$

38.  $\sqrt[5]{8^4}$

39.  $\sqrt[3]{12^2}$

40.  $\sqrt{n^5}$

41.  $\sqrt[4]{p^7}$

42.  $\sqrt[5]{m^3}$