

# 11-1 Practice

## Roots and Radical Expressions

Find each real root.

1.  $\sqrt{144}$
2.  $-\sqrt{25}$
3.  $\sqrt{-0.01}$
4.  $\sqrt[3]{0.001}$
5.  $\sqrt[4]{0.0081}$
6.  $\sqrt[3]{27}$
7.  $\sqrt[3]{-27}$
8.  $\sqrt{0.09}$

Simplify each radical expression. Use absolute value symbols when needed.

9.  $\sqrt{81x^4}$
10.  $\sqrt{121y^{10}}$
11.  $\sqrt[3]{8g^6}$
12.  $\sqrt[3]{125x^9}$
13.  $\sqrt[5]{243x^5y^{15}}$
14.  $\sqrt[3]{(x-9)^3}$
15.  $\sqrt{25(x+2)^4}$
16.  $\sqrt[3]{\frac{64x^9}{343}}$
17.  $\sqrt[3]{-0.008}$
18.  $\sqrt[4]{\frac{x^4}{81}}$
19.  $\sqrt{36x^2y^6}$
20.  $\sqrt[4]{(m-n)^4}$

21. A cube has volume  $V = s^3$ , where  $s$  is the length of a side. Find the side length for a cube with volume  $8000 \text{ cm}^3$ .
22. The temperature  $T$  in degrees Celsius ( $^{\circ}\text{C}$ ) of a liquid  $t$  minutes after heating is given by the formula  $T = 8\sqrt{t}$ . When is the temperature  $48^{\circ}\text{C}$ ?
23. The number of new customers  $n$  that visit a dry cleaning shop in one year is directly related to the amount  $a$  (in dollars) spent on advertising. This relationship is represented by  $n^3 = 13,824a$ . To attract 480 new customers, how much should the owners spend on advertising during the year?
24. **Geometry** The volume  $V$  of a sphere with radius  $r$  is given by the formula  $V = \frac{4}{3}\pi r^3$ .
  - a. What is the radius of a sphere with volume  $36\pi$  cubic inches?
  - b. If the volume increases by a factor of 8, what is the new radius?
25. A clothing manufacturer finds the number of defective blouses  $d$  is a function of the total number of blouses  $n$  produced at her factory. This function is  $d = 0.000005n^2$ .
  - a. What is the total number of blouses produced if 45 are defective?
  - b. If the number of defective blouses increases by a factor of 9, how does the total number of blouses change?