NAME _____ DATE _____

# Practice 48

FOR USE WITH SECTION 8.2

**Evaluate each radical expression, or state that it is *undefined*.**

**1.** $-\sqrt{1}$ **2.** $\sqrt{49}$ **3.** $\sqrt[3]{-0.125}$ **4.** $\sqrt[3]{0}$

**5.** $\sqrt{-\frac{1}{16}}$ **6.** $\sqrt{-\frac{1}{27}}$ **7.** $\sqrt[5]{-100{,}000}$ **8.** $\sqrt{-\frac{1}{9}}$

**9.** $\sqrt[5]{0.00032}$ **10.** $\sqrt[4]{810{,}000}$ **11.** $\sqrt[6]{-1}$ **12.** $\sqrt{-\frac{125}{8}}$

**State the domain and range of each function.**

**13.** $y = \sqrt{x - 5}$ **14.** $y = \sqrt[3]{x + 4}$ **15.** $y = \sqrt{x + 1} - 2$

**16.** $y = \sqrt{3 - x}$ **17.** $y = \sqrt[4]{x + 2} + 3$ **18.** $y = 5 - \sqrt{x - 1}$

**Simplify each expression.**

**19.** $\sqrt{192}$ **20.** $\sqrt[3]{-500}$ **21.** $\sqrt[5]{96x^6}$ **22.** $\sqrt[4]{162y^8}$

**23.** The formula for the volume $V$ of a cylinder of height $h$ and radius $r$ is $V = \pi r^2 h$.

**a.** A cylindrical container is to have a height that is 3 times its radius. Express the radius of such a container in terms of its volume.

**b.** Suppose the container in part (a) is to have a volume of 1000 $cm^3$. What should the radius of the container be?

**24.** The length of a planet's year $T$ (its orbit time around the sun) in Earth days is given by

$$T = kd^{3/2},$$

where $d$ is the planet's mean distance from the sun (in miles) and $k$ is a constant.

**a.** Find the value of $k$ using the fact that Earth takes 365.26 days to orbit the sun and that its mean distance from the sun is 92,960,000 mi.

**b.** Jupiter's mean distance from the sun is 483,600,000 mi. Find the approximate length of its year.

**25. Writing** Are the expressions $(\sqrt[n]{x})^m$ and $\sqrt[n]{x^m}$ always equivalent for all positive integers $m$ and $n$ and all real numbers $x$? Explain why or why not.