

# CHAPTER TEST

Evaluate the expression without using a calculator.

- $-125^{1/3}$
- $32^{1/5}$
- $\sqrt[4]{81}$
- $\sqrt[3]{27}$
- $8^{5/3}$
- $16^{-3/2}$
- $(\sqrt[3]{-27})^2$
- $(\sqrt[3]{64})^{-4}$

Write the expression in simplest form. Assume all variables are positive.

- $\sqrt[3]{88}$
- $\sqrt[5]{16} \cdot \sqrt[5]{8}$
- $\sqrt[3]{64x^4y^2}$
- $\sqrt[4]{2x^6y^8z}$
- $\sqrt{\frac{12}{49}}$
- $\sqrt{\frac{x^6}{y^4}}$
- $\sqrt[3]{24}$
- $\sqrt[3]{\frac{75x^5y^6}{36xz^5}}$

Let  $f(x) = 2x + 9$  and  $g(x) = 3x - 1$ . Perform the indicated operation and state the domain.

- $f(x) + g(x)$
- $f(x) - g(x)$
- $f(g(x))$
- $g(f(x))$
- $f(x) \cdot g(x)$
- $g(f(x))$
- $\frac{f(x)}{g(x)}$
- $g(g(x))$

Find the inverse of the function.

- $y = -2x + 5$
- $y = \frac{1}{3}x + 4$
- $y = \frac{1}{2}x^4, x \geq 0$
- $f(x) = x^3 + 5$
- $y = -6\sqrt[3]{x}$
- $y = \sqrt{x - 4} - 2$
- $f(x) = 5x - 12$
- $f(x) = -2x^3 + 1$
- $f(x) = -\sqrt[3]{x + 3} + 4$

Graph the function. Then state the domain and range.

Solve the equation. Check for extraneous solutions.

- $\sqrt{3x + 7} = 4$
- $\sqrt{3x} - \sqrt{x + 6} = 0$
- $x - 3 = \sqrt{x - 1}$

**37. KINETIC ENERGY** The kinetic energy  $E$  (in joules) of a 1250 kilogram compact car is given by the equation  $E = 625s^2$  where  $s$  is the speed of the car (in meters per second).

- Write an inverse model that gives the speed of the car as a function of its kinetic energy.
- Use the inverse model to find the speed of the car if its kinetic energy is 120,000 joules. Give the speed in kilometers per hour.
- If the kinetic energy doubles, will the speed double? Explain why or why not.

**38. BOWLING SCORES** In bowling, a *handicap* is a change in score to adjust for differences in players' abilities. You belong to a bowling league in which each bowler's handicap  $h$  is determined by his or her average  $a$  using this formula:

$$h = 0.9(200 - a)$$

If a bowler's average is over 200, the handicap is 0. Find the inverse of the model. Then find your average if your handicap is 36.