

CHAPTER

1

What You'll Learn in Chapter 1

- How to evaluate algebraic expressions
- How to use exponential notation
- How to use properties of numbers in algebra
- How to write expressions and evaluate formulas

Skills & Concepts You Need for Chapter 1

Add or subtract. Simplify answers if possible.

1. $\frac{3}{7} + \frac{2}{7}$

2. $\frac{3}{8} + \frac{1}{6}$

3. $6\frac{3}{4} + 9\frac{5}{8}$

4. $3\frac{1}{2} + 4\frac{2}{3} + 7\frac{1}{4}$

5. $\frac{5}{9} - \frac{2}{9}$

6. $\frac{5}{6} - \frac{2}{5}$

7. $1\frac{7}{8} - \frac{3}{4}$

8. $7 - \frac{5}{8}$

Multiply. Simplify answers if possible.

9. $\frac{3}{4} \times \frac{3}{4}$

10. $\frac{5}{8} \times 18$

11. $4\frac{1}{5} \times 3\frac{5}{7}$

12. $2\frac{3}{10} \times 3\frac{1}{3}$

Divide. Simplify answers if possible.

13. $\frac{7}{12} \div \frac{7}{12}$

14. $\frac{3}{4} \div 2$

15. $3\frac{1}{3} \div 1\frac{1}{4}$

16. $3 \div \frac{1}{3}$

Add.

17. $0.5 + 0.35 + 1.5$

18. $14 + 3.75 + 8.6$

19. $1 + 0.02 + 0.2$

Subtract.

20. $7 - 4.38$

21. $11.2 - 6.09$

22. $8.9 - 0.76$

Multiply.

23.
$$\begin{array}{r} 8.75 \\ \times 6 \\ \hline \end{array}$$

24.
$$\begin{array}{r} 0.75 \\ \times 0.003 \\ \hline \end{array}$$

25.
$$\begin{array}{r} 7.82 \\ \times 7.9 \\ \hline \end{array}$$

26.
$$\begin{array}{r} 0.0004 \\ \times 57 \\ \hline \end{array}$$

Divide. Round answers to the nearest hundredth, if necessary.

27. $7 \overline{)8.1}$

28. $0.08 \overline{)396.7}$

29. $1.1 \overline{)0.44}$

30. $0.6 \overline{)5.82}$

31. $0.065 \overline{)333}$

32. $8 \overline{)0.91}$

CHAPTER

2

What You'll Learn in Chapter 2

- How to use integers and rational numbers to model real situations
- How to add, subtract, multiply, and divide rational numbers and how to use these operations in solving problems
- How to use the distributive property to simplify algebraic expressions
- How to apply the properties of numbers, axioms and theorems, to algebraic expressions

Skills & Concepts You Need for Chapter 2

1-2 Simplify.

1. $\frac{12}{27}$

2. $\frac{a}{4ab}$

3. $\frac{13xy}{xy}$

4. $\frac{18cd}{15d}$

1-3 Evaluate.

5. $(4n)^2$ for $n = 2$

6. p^1 for $p = 24$

7. $3x^3$ for $x = 2$

1-5 Multiply.

8. $5(a + b + d)$

9. $11(w + 4)$

10. $7(3z + y + 2)$

1-5 Factor.

11. $4x + 9y$

12. $3a + 12b$

13. $4x + 10 + 8y$

1-5 Collect like terms.

14. $5x + 3y + 2x$

15. $b^2 + 3a + 4b^2$

16. $5t + 2 + 3t + 7$

Solve for the given replacement set.

17. $4x + 2 = 30$ $\{3, 5, 7\}$

18. $8a = 4$ $\{0.5, 5, 50\}$

CHAPTER 4

What You'll Learn in Chapter 4

- How to graph inequalities
- How to solve inequalities in one variable
- How to write inequalities to solve problems
- How to use logical reasoning to solve problems

Skills & Concepts You Need for Chapter 4

2-2 Graph each number on the number line.

1. $\frac{5}{3}$

2. $\frac{2}{5}$

3. $-\frac{3}{4}$

Use the proper symbol $>$ or $<$.

4. $-\frac{3}{4} \square -\frac{2}{5}$

5. $-1.5 \square 0.65$

6. $\frac{3}{4} \square -2$

3-3 Solve.

7. $3x - 2 = 7$

8. $-6x + 4 = 28$

9. $40 - 2x = 26$

10. $5x + 3x = 64$

11. $2(5y + 3) = 56$

12. $8(3a + 5) + a = 65$

3-4 Write as an algebraic expression.

13. the sum of three consecutive even integers

14. one-half of the number plus 12

15. thirty-two less than twice the number

16. two greater than 3 times a number

3-5 Solve.

17. $2x + 20 + 33x = 80 + 15x$

18. $3(2x - 1) + 4 = x + 25$

19. $14p - 10 = 8 + 2p$

20. $4(2x + 1) = 3(x + 13)$

Solve.

21. $\frac{b}{3} - 2 = 6$

22. $\frac{2}{9}b + \frac{1}{3}b = \frac{4}{9} - \frac{1}{3}b$

23. $0.9x - 0.5x = 6$

24. $0.32y = 0.3y + 32$

CHAPTER

6

What You'll Learn in Chapter 6

- How to factor special products and common factors
- How to factor trinomials
- How to use general strategies to factor polynomials
- How to solve polynomial equations by factoring

Skills & Concepts You Need for Chapter 6

1-5 Factor.

1. $6x + 6y$

2. $24w + 24z$

3. $4y + 28 + 12z$

3-4 Write as an algebraic expression.

4. 10 more than twice the number

5. 2 times the sum of a number and 6

3-5 Solve.

6. $6y + 4 = 2y + 8$

7. $3(2a + 4) = 20$

3-11

8. The perimeter of a rectangle is 280 cm. The length is 20 cm more than the width. Find the dimensions.

5-3 Multiply.

9. $(-6x^8)(2x^5)$

10. $(-6x^2y^2)(4xy^4)$

5-9 Multiply.

11. $9x(4x + 7)$

12. $3s(6t^4 - 2s^2 - 3t - 6)$

13. $(3x + 8)(x - 7)$

14. $(x + 3)(5x - 7)$

15. $8x(2x^2 - 6x + 1)$

16. $(x + 6)(x - 4)$

17. $(y - 8)(y + 3)$

18. $(7w + 6)(4w - 1)$

5-10 Multiply.

19. $(x - 9)^2$

20. $(5x + 3)^2$

21. $(a - 7)(a + 7)$

22. $(2 - 5y)(2 + 5y)$

Determine whether the given ordered pair is a solution of the system of equations.

1. $(4, 2); x - y = 2$
 $x + y = 6$

2. $(-8, -7); x - 2y = 6$
 $2x - 3y = 5$

Solve by graphing.

3. $x - y = 3$
 $x + y = 5$

4. $x + 2y = 6$
 $2x - 3y = 26$

5. $x = 2y + 4$
 $y = 2x - 8$

6. $x = y - 1$
 $3y = -2x - 2$

Solve using the substitution method.

7. $y = 6 - x$
 $2x - 3y = 22$

8. $x + 2y = 5$
 $x + y = 2$

9. $x + y = 31$
 $x - y = 17$

10. $7x + y = 10$
 $2y + 5x = 11$

Solve using the addition method.

11. $x - y = 6$
 $3x + y = -2$

12. $3x - 4y = 7$
 $x + 4y = 5$

13. $4x + 5y = 5$
 $6x + 7y = 7$

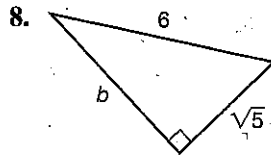
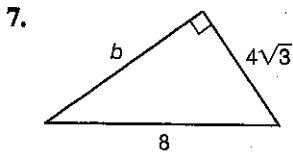
14. $2x + 3y = 13$
 $3x - 5y = 10$

15. $x + y = 4$
 $2x + 3y = 7$

16. $8x - 10y = 2$
 $7x - 5y = 13$

Translate to a system of equations and solve.

17. A motorboat traveled for 2 hours with an 8 km/h current. The return trip against the same current took 3 hours. Find the speed of the motorboat in still water.
18. The sum of two numbers is 8. Their difference is 12. Find the numbers.
19. A collection of dimes and quarters totals \$3.55. There are 25 coins in all. How many quarters are there?
20. Tickets to a junior high school play cost \$1.10 for each adult and \$0.40 for each child. If 360 tickets were sold for a total of \$282.60, how many tickets of each kind were sold?
21. One train leaves a station heading due west. Two hours later a second train leaves the same station heading due east. The second train is traveling 15 mi/h faster than the first. Six hours after the second train leaves, the two trains are 580 miles apart. Find the rate at which each train is traveling.



Find the length of the side not given for a right triangle with hypotenuse c and legs a and b .

9. $a = 10, b = 24$

10. $a = 5, b = 12$

11. $a = 9, c = 15$

12. $a = 18, c = 30$

13. $b = 1, c = \sqrt{5}$

14. $b = 1, c = \sqrt{2}$

15. $a = 1, c = \sqrt{3}$

16. $a = \sqrt{3}, b = \sqrt{5}$

17. $c = 10, b = 5\sqrt{3}$

18. $a = 3\sqrt{3}, c = 5\sqrt{3}$

19. **Error Analysis** A student found the length of the hypotenuse. What error did the student make?

$$c^2 = a^2 + b^2$$

$$c^2 = 5^2 + 8^2$$

$$\sqrt{c^2} = \sqrt{5^2 + 8^2}$$

$$c = 5 + 8$$

$$c = 13$$

B

An equilateral triangle is shown to the right.

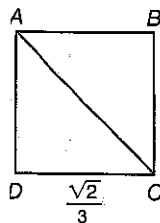
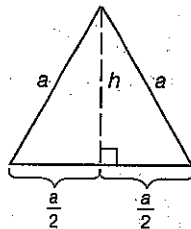
20. Find an expression for height h in terms of a .

21. Find an expression for area A in terms of a .

22. Find an expression for area A in terms of h .

23. **TEST PREP** Which is longest?

- A. the diagonal of a square with 6 cm sides
- B. the diagonal of a rectangle with length 7 cm and width 5 cm
- C. the hypotenuse of a right triangle with legs 4 cm and 9 cm long
- D. the leg of a right triangle with the other leg 10 cm and the hypotenuse 15 cm long



24. Figure $ABCD$ is a square. Find AC .

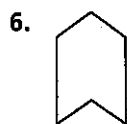
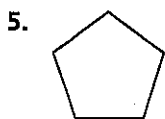
25. **Critical Thinking** A right triangle has sides whose lengths are consecutive integers. Find the lengths of the sides.

Vocabulary and Core Concept Check

- COMPLETE THE SENTENCE** The perimeter of a square with side length s is $P = \underline{\hspace{2cm}}$.
- WRITING** What formulas can you use to find the area of a triangle in a coordinate plane?

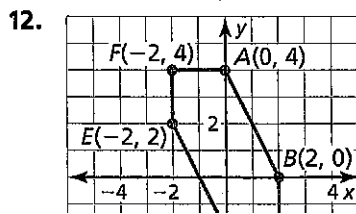
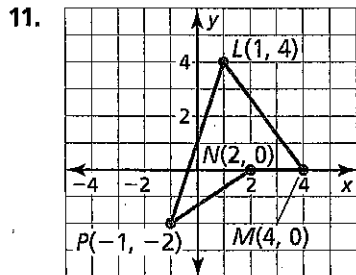
Monitoring Progress and Modeling with Mathematics

In Exercises 3–6, classify the polygon by the number of sides. Tell whether it is *convex* or *concave*. (See Example 1.)



In Exercises 7–12, find the perimeter of the polygon with the given vertices. (See Example 2.)

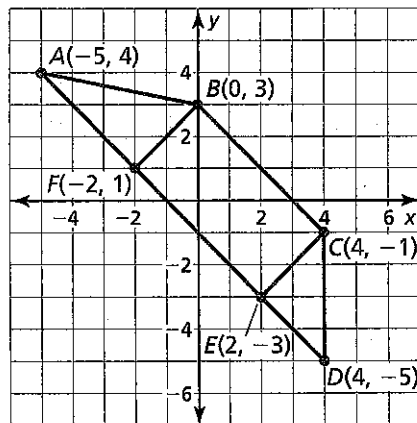
- $G(2, 4), H(2, -3), J(-2, -3), K(-2, 4)$
- $Q(-3, 2), R(1, 2), S(1, -2), T(-3, -2)$
- $U(-2, 4), V(3, 4), W(3, -4)$
- $X(-1, 3), Y(3, 0), Z(-1, -2)$



In Exercises 13–16, find the area of the polygon with the given vertices. (See Example 3.)

- $E(3, 1), F(3, -2), G(-2, -2)$
- $J(-3, 4), K(4, 4), L(3, -3)$
- $W(0, 0), X(0, 3), Y(-3, 3), Z(-3, 0)$
- $N(-2, 1), P(3, 1), Q(3, -1), R(-2, -1)$

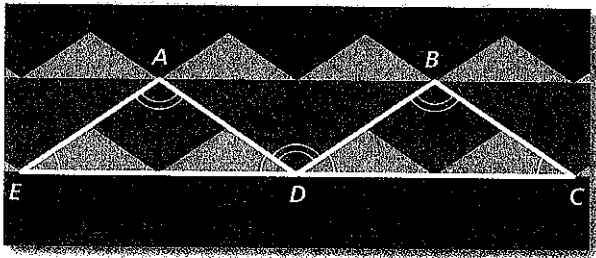
In Exercises 17–24, use the diagram.



- Find the perimeter of $\triangle CDE$.
- Find the perimeter of rectangle $BCEF$.
- Find the perimeter of $\triangle ABF$.
- Find the perimeter of quadrilateral $ABCD$.
- Find the area of $\triangle CDE$.
- Find the area of rectangle $BCEF$.
- Find the area of $\triangle ABF$.



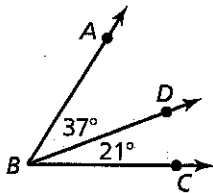
In Exercises 17–20, $m\angle AED = 34^\circ$ and $m\angle EAD = 112^\circ$.
(See Example 3.)



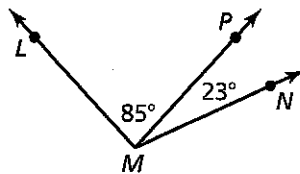
17. Identify the angles congruent to $\angle AED$.
18. Identify the angles congruent to $\angle EAD$.
19. Find $m\angle BDC$.
20. Find $m\angle ADB$.

In Exercises 21–24, find the indicated angle measure.

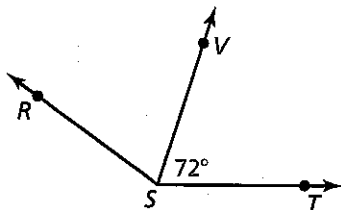
21. Find $m\angle ABC$.



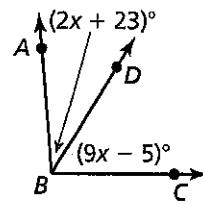
22. Find $m\angle LMN$.



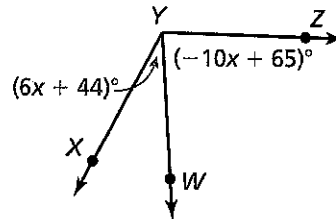
23. $m\angle RST = 114^\circ$. Find $m\angle RSV$.



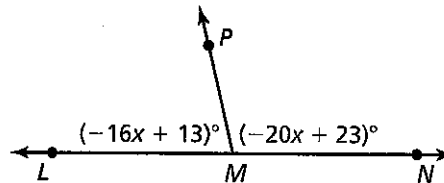
24. $\angle GHK$ is a straight angle. Find $m\angle LHK$.



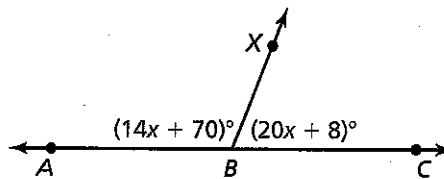
26. $m\angle XYZ = 117^\circ$. Find $m\angle XYW$ and $m\angle WYZ$.



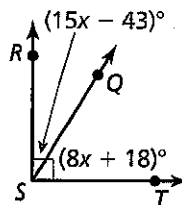
27. $\angle LMN$ is a straight angle. Find $m\angle LMP$ and $m\angle NMP$.



28. $\angle ABC$ is a straight angle. Find $m\angle ABX$ and $m\angle CBX$.



29. Find $m\angle RSQ$ and $m\angle TSQ$.



30. Find $m\angle DEH$ and $m\angle FEH$.

