

To the Student

This *Skills Practice Workbook* gives you additional examples and problems for the exercises in each lesson. The exercises are designed to aid your study of mathematics by reinforcing important mathematical skills needed to succeed in the everyday world. The materials are organized by chapter and lesson, with one Practice worksheet for every lesson in Chapters 1–8 of *California Algebra Readiness*.

Always keep your completed workbook handy. Along with your textbook, daily homework, and class notes, the completed *Skills Practice Workbook* can help you in reviewing for quizzes and tests.

To the Teacher

These worksheets are the same ones found in the Chapter Resource Masters for *California Algebra Readiness*. The answers to these worksheets are available at the end of each Chapter Resource Masters booklet as well as in your Teacher Wraparound Edition interleaved pages.

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1-1**Practice: Skills*****A Plan for Problem Solving***

Answer these questions about the four-step problem-solving plan.

1. During which step do you ask if your answer makes sense?
2. During which step do you revise or make a new plan if your first plan doesn't work?
3. During which step do you select a strategy for solving the problem?
4. During which step do you ask yourself, "What do I need to find out?"

Choose one of the following to describe how you would plan to solve each problem. Do not solve the problems.

- A. Use only one operation, such as addition or multiplication.**
- B. Use a combination of operations, such as division and addition.**
- C. Use a different strategy.**

5. **MONEY** Julia opened a savings account with a deposit of \$36. She then deposited \$5 per week for one month. She then withdrew \$9.50. How much is left in her savings account?
6. In how many different patterns can 3 rose bushes, 2 sunflowers, and 5 tulip plants be planted in a garden?
7. Use the four-step plan to solve Exercise 5.
 - A. Understand
 - B. Plan
 - C. Solve
 - D. Check

1-2**Practice: Skills*****Expressions and Equations***

Write a verbal phrase for each algebraic expression.

1. $x + 4$

2. $2y - 4$

3. $\frac{z}{3} + 8$

4. $6 - a$

Write a numerical expression for each verbal phrase.

5. the difference of seventeen and three

6. eleven more than six

7. the sum of eight, twenty, and thirty-five

8. the quotient of forty and eight

9. one hundred decreased by twenty-five

10. three more than one dozen

11. the product of twenty and thirty

12. five less than fifty

Write an equation for each sentence.

13. Four times x equals 16.14. The sum of two and y is the same as 42.15. Double a number, n , is equal to 56.

1-3**Practice: Skills*****Order of Operations*****Evaluate each expression.**

1. $9 - 3 + 4$

2. $8 + 6 - 5$

3. $12 \div 4 + 5$

4. $25 \cdot 2 - 7$

5. $36 \div 9(2)$

6. $6 + 3(7 - 2)$

7. $3 \cdot 6.2 + 5^2$

8. $(1 + 11)^2 \div 3$

9. $12 - (2 + 8)$

10. $15 - 24 \div 4 \cdot 2$

11. $(4 + 2) \cdot (7 + 4)$

12. $(3 \cdot 18) \div (2 \cdot 9)$

13. $24 \div 6 + 4^2$

14. $3 \cdot 8 - (9 - 7)^3$

15. $9 + (9 - 8 + 3)^4$

16. $3 \cdot 2^2 + 24 \div 8$

17. $(15 \div 3)^2 + 9 \div 3$

18. $(52 \div 4) + 5^3$

19. $26 \cdot 10^3$

20. $7.2 \cdot 10^2$

21. $5 \cdot 4^2 - 3 \cdot 2$

22. $24 \div 6 \div 2$

23. $13 - (6 - 5)^5$

24. $(8 - 3 \cdot 2) \cdot 6$

25. $(11 \cdot 4 - 10) \div 2$

26. $10 \div 2 \cdot (4 - 3)$

27. $1.82 \cdot 10^5$

28. $35 \div 7 \cdot 2 - 4$

29. $2^5 + 7(9 - 1)$

30. $12 + 16 \div (3 + 1)$

1-4**Practice: Skills*****Commutative and Associative Properties***

Name the property shown by each statement.

1. $9 \cdot 7 = 7 \cdot 9$

2. $13 + (5 + 10) = (5 + 10) + 13$

3. $(6 + 2) + 5 = 6 + (2 + 5)$

4. $14 + 6 = 6 + 14$

5. $75 + 25 = 25 + 75$

6. $2 \cdot (3 \cdot 4) = (2 \cdot 3) \cdot 4$

7. $6 + (5 + 3) = (6 + 5) + 3$

8. $2(6) = 6(2)$

9. $4 + 23 + 46 = 23 + 4 + 46$

10. $2 \cdot 15 \cdot 10 = 15 \cdot 2 \cdot 10$

11. $(2 + 43) + 38 = 2 + (43 + 38)$

12. $8 \cdot (9 \cdot 10) = (8 \cdot 9) \cdot 10$

13. $11 + (28 + 19) = (11 + 28) + 19$

14. $8 \cdot 10 = 10 \cdot 8$

15. $5 + 2 + 84 = 2 + 5 + 84$

16. $(40 + 5) + 6 = 40 + (5 + 6)$

1-5 Practice: Skills***Distributive Property*****Write an equation that shows the Distributive Property.**

1. $3(5 + 1)$

2. $(2 + 7)5$

3. $(10 + 2)7$

4. $2(9 - 8)$

5. $4(10 - 2)$

6. $6(13 + 4)$

Complete each equation.

7. $2(3 + 7) = 2(\underline{\quad}) + 2(7)$

8. $4(6 + 2) = \underline{\quad}(6) + 4(2)$

9. $3(9 - 7) = 3(9) - 3(\underline{\quad})$

10. $6(10 - 2) = 6 \cdot \underline{\quad} - 6 \cdot 2$

11. $2(7 + 4) = 2 \cdot 7 + \underline{\quad} \cdot 4$

12. $(4 + 6)10 = 4 \cdot 10 + \underline{\quad} \cdot 10$

13. $2(8 + \underline{\quad}) = 2(8) + 2(2)$

14. $6(200 + 50) = \underline{\quad}(200) + \underline{\quad}(50)$

Write an equation that shows the Distributive Property.

15. $4(6 - 4)$

16. $10(2 - 1)$

17. $(3 + 5)6$

18. $5(6 - 3)$

19. $12(4 - 2)$

20. $7(6 + 8)$

1-6**Practice: Skills*****Problem-Solving Strategy: Guess and Check***

Use the guess-and-check strategy to solve each problem.

- 1. NUMBER THEORY** A number cubed is 1,728. What is the number?
- 2. MONEY** Jackson has exactly \$43 in \$1, \$5, and \$10 bills. If he has 8 bills, how many of each bill does he have?
- 3. NUMBERS** Jona is thinking of two numbers. One number is 18 more than twice the other number. The sum of the numbers is 48. What two numbers is Jona thinking of?
- 4. PACKAGES** The packages in a mail driver's truck weigh a total of 950 pounds. The large packages weigh 20 pounds each and the small packages weigh 10 pounds each. Suppose he has 10 more large packages than small packages. How many large and small packages are on the truck?
- 5. NUMBER THEORY** One number is twice the other. The sum of the numbers is 246. What are the two numbers?
- 6. MOVIE RENTALS** A movie rental store rented 3 times as many DVDs as videos. DVDs rent for \$5 a day and videos rent for \$3 a day. Suppose the total rental income for a weekend was \$2,160. How many DVDs and videos did the store rent?

1-7 Practice: Skills

Other Properties

Use what you know about properties to complete each equation.

1. $32 + \underline{\quad} = 32$

2. $4 + 0 = \underline{\quad}$

3. $82 = 1 \cdot \underline{\quad}$

4. $12 = 12 + \underline{\quad}$

5. $32 \cdot 1 = \underline{\quad}$

6. $78 \cdot \underline{\quad} = 78$

7. $822 + \underline{\quad} = 822$

8. $930 + 0 = \underline{\quad}$

Name the property shown by each statement.

9. $(4 + 5)3 = 4(3) + 5(3)$

10. $1 \cdot x^2 = x^2$

11. $2(bc) = (2b)c$

12. $(6 + 2) + 5 = 6 + (2 + 5)$

13. $2(bc) = 2(cb)$

14. $(4 + 5) + 0 = 4 + 5$

15. $13 + (5 + 10) = (5 + 10) + 13$

16. $3(7 - 2) = 3(7) - 3(2)$

1-8**Practice: Skills*****Simplifying Expressions*****Simplify each expression.**

1. $7a + a$

2. $k - k$

3. $m + 3m + 8$

4. $10b - b + 1$

5. $9j + 8j - 7j$

6. $6y + 3y + 6y - 2y$

7. $3q + 2q - q$

8. $18 + 7x - 12 + 5x$

9. $12a + 3 + 18 - 9a$

10. $13c - 7 + c + d$

11. $5h + h - 4h + 1 - 2h$

12. $2(v + 5) + 7v + 4$

13. $5(r + 9) - 5$

14. $1 + 4(u + 1)$

15. $7(w + 4) + 3w - 27$

16. $8 + 7(y + 2)$

17. $18(c + 1) - 18$

18. $12(n - 4) - 3n$

19. $5m - 9 + 4m$

20. $7 + g + 1 + 6g$

21. $x + 8x + 3 - 9x - 3$

22. $6(r + 4) + r + 30 - 7r$

23. $5 + 5a + 4 - 2a + 3a$

24. $21 + 8(v + 3) + 3 + 7v$

25. $4x - 9 + 3x + 6 + 9x - 4$

26. $p + 2 + 1 - p + 1 + 2p$

27. $11f + 6 - f + 4 + 13f - 9$

28. $3(d + 4) + 2 - 2d + 1 - d$

29. $1 + s + 2 + 2s - 3s + 1$

30. $5 + 9k + 1 + k + 2(7 + k)$

31. $1 + g + 5 + 2g + 3(g - 2)$

32. $7h + 1 + h + 4 - 2 - 8h$

33. $12 + 7(d - 1) + 14 - d$

2-1 Practice: Skills

Equations

Solve each equation mentally.

1. $a + 7 = 16$

2. $12 + x = 21$

3. $4d = 60$

4. $15 = \frac{u}{3}$

5. $\frac{b}{7} = 12$

6. $13 \cdot 3 = y$

7. $8 + r = 17$

8. $27 - 12 = m$

9. $h - 22 = 67$

10. $27 + 15 = n$

11. $36 + a = 96$

12. $99 \div d = 3$

13. $6t = 66$

14. $25 = y \div 4$

15. $b - 25 = 120$

16. $n \div 5 = 10$

17. $4y = 48$

18. $5t = 40$

19. $50 \cdot d = 150$

20. $w + 61 = 65$

21. $88 \div k = 2$

Graph the solution of each equation on a number line.

22. $v - 6 = 30$

23. $3a = 27$

24. $n + 7 = 14$

Define a variable. Write an equation and solve.

25. **BAKING** Judy wants to buy some cookies for her birthday party. Cookies come in packages of 6. Suppose she is inviting 24 friends to her party. How many packages of cookies does she need to buy so that each of her friends can have one cookie each?

2-2**Practice: Skills*****Integers***

Replace each \bullet with $<$, $>$, or $=$ to make a true sentence.

1. $1 \bullet 0$

2. $-3 \bullet 0$

3. $0 \bullet -1$

4. $0 \bullet 9$

5. $-7 \bullet -7$

6. $2 \bullet -2$

7. $-2 \bullet 8$

8. $-4 \bullet 4$

9. $5 \bullet 5$

10. $0 \bullet -6$

11. $4 \bullet 10$

12. $6 \bullet -6$

13. $3 \bullet 7$

14. $-1 \bullet -2$

15. $3 \bullet 4$

16. $-3 \bullet -4$

Order the integers in each set from least to greatest.

17. $\{4, -5, 0\}$

18. $\{8, -2, 1\}$

19. $\{-6, -3, 0\}$

20. $\{-5, 5, 3, -1\}$

21. $\{0, -3, 7, -2\}$

22. $\{9, -11, 1, 0\}$

23. $\{12, -4, 3, -1\}$

24. $\{-8, 15, 1, -10\}$

25. $\{-12, -17, -20, 2\}$

Evaluate each expression.

26. $|1|$

27. $|-10|$

28. $|-8|$

29. $|10|$

30. $|4| + |-4|$

31. $|9| - |-5|$

32. $0 + |-1|$

33. $|-6| + |-5|$

34. $|-8| - |-8|$

35. $|12| + |-3|$

36. $|-15| - |6|$

37. $|-13| + |-7|$

Write an integer for each situation.

38. 15°C below 0

39. a profit of \$27

40. 2010 A.D.

41. average attendance is down 38 people

42. 376 feet above sea level

43. a withdrawal of \$200

2-3**Practice: Skills*****Adding and Subtracting Integers*****Find each sum.**

1. $-7 + (-5)$

2. $10 + 9$

3. $-12 + (-5)$

4. $-13 + (-3)$

5. $-10 + 12$

6. $-7 + 8$

7. $-11 + (-6)$

8. $0 + (-21)$

9. $72 + (-10)$

10. $72 + 10$

11. $-13 + (-11)$

12. $-52 + 52$

13. $-6 + (-12)$

14. $14 + (-8)$

15. $-17 + (-2)$

16. $50 + (-8)$

17. $-22 + 4$

18. $14 + 8$

19. $-21 + (-9)$

20. $15 + (-5)$

21. $9 + 10$

22. $-12 + (-15)$

23. $-13 + 6$

24. $-1 + (-18)$

25. $0 + 31$

26. $-45 + (-15)$

27. $-6 + 20$

28. $24 + (-11)$

29. $7 + (-14)$

30. $-34 + (-10)$

31. $-8 + (-25)$

32. $-31 + 25$

Find each difference.

33. $-2 - (-8)$

34. $4 - (-11)$

35. $-7 - 6$

36. $15 - 2$

37. $-7 - (-1)$

38. $1 - 9$

39. $-5 - (-3)$

40. $6 - (-5)$

41. $-4 - (-10)$

42. $4 - 6$

43. $0 - (-15)$

44. $-16 - (-10)$

45. $0 - 16$

46. $11 - (-9)$

47. $-9 - 1$

48. $-1 - (-8)$

49. $1 - (-2)$

50. $-2 - (-19)$

51. $13 - 17$

52. $20 - (-15)$

2-4**Practice: Skills*****Multiplying Integers*****Find each product.**

1. $-2(8)$

2. $-4(-4)$

3. $6(-2)$

4. $-7(-3)$

5. $12(1)$

6. $0(-2)$

7. $-11(5)$

8. $-9(-3)$

9. $-13(0)$

10. $-1(-1)$

11. $-1(1)$

12. $1(-1)$

13. $-5(20)$

14. $16(-2)$

15. $18(-3)$

16. $-5(-5)$

17. $8(6)(-2)$

18. $-1(50)(-1)$

19. $6(0)(-2)$

20. $(-3)(-2)(-1)$

21. $-4(5)(-3)$

22. $10(-3)(2)$

23. $-9(8)(1)$

24. $-1(-1)(-1)$

25. $-4(6)$

26. $-2(-8)$

27. $12(-4)$

28. $-6(5)$

29. $-10(-9)$

30. $-(-5)^2$

31. $(-5)^2$

32. $-30(5)$

33. $20(-6)$

34. $-14(-6)$

35. $(-13)^2$

36. $-7(15)$

ALGEBRA Evaluate each expression if $x = -5$ and $y = -6$.

37. $3y$

38. $-8x$

39. $-4y$

40. $12x$

41. xy

42. $-xy$

43. $-6xy$

44. $4xy$

2-5 Practice: Skills

Dividing Integers

Find each quotient.

1. $16 \div 4$

2. $-27 \div 3$

3. $25 \div (-5)$

4. $63 \div (-9)$

5. $-15 \div (-3)$

6. $14 \div (-7)$

7. $-124 \div 4$

8. $60 \div 15$

9. $28 \div (-4)$

10. $-56 \div (-8)$

11. $72 \div 8$

12. $-21 \div (-7)$

13. $\frac{-32}{4}$

14. $\frac{45}{9}$

15. $\frac{-45}{3}$

16. $\frac{-25}{-5}$

17. $\frac{35}{-7}$

18. $\frac{-63}{-7}$

19. $\frac{-144}{12}$

20. $\frac{48}{-6}$

21. What is -54 divided by 9 ?22. Divide -27 by -3 .23. Divide 144 by -12 .24. What is -65 divided by -13 ?

Evaluate each expression if $x = -8$ and $y = -12$.

25. $x \div 2$

26. $x \div (-4)$

27. $36 \div y$

28. $0 \div y$

29. $-60 \div y$

30. $56 \div x$

31. $8 \div x$

32. $-108 \div y$

33. $\frac{x}{-2}$

34. $\frac{y}{3}$

35. $\frac{0}{x}$

36. $\frac{-112}{x}$

37. $\frac{y}{-6}$

38. $\frac{x}{4}$

39. $\frac{-144}{y}$

40. $\frac{-136}{x}$

Evaluate each expression if $f = -15$, $g = 5$, and $h = -45$.

41. $-20 \div g$

42. $90 \div h$

43. $h \div f$

44. $fg \div 25$

45. $\frac{f-h}{10}$

46. $\frac{g-5}{-1}$

47. $-f^2 \div g$

48. $\frac{h-3g}{f}$

49. $\frac{f+h}{-g}$

2-6**Practice: Skills*****Problem-Solving Strategy: Look for a Pattern***

Solve. Use the look-for-a-pattern strategy.

1. **NUMBER SENSE** Describe the pattern below, Then find the missing number.

1, 20, 400 $\underline{\quad?}$, 160,000

2. **GEOMETRY** Use the pattern below to find the perimeter of the eighth figure.

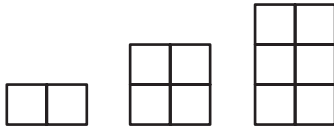
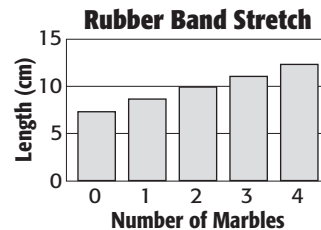


Figure 1

Figure 2

Figure 3

3. **PHYSICAL SCIENCE** A cup of marbles hangs from a rubber band. The length of the rubber band is measured as shown in the graph at the right. Predict the approximate length of the rubber band if 6 marbles are in the cup.



4. **ALLOWANCE** In 2002, Estella earned \$200 in allowance, and Kelsey earned \$150 in allowance. Each year Kelsey earned \$20 more in allowance, and Estella earned \$10 more. In what year will they earn the same amount of money? How much will it be?
5. **POPULATION** The Springfield Zoo is breeding gorillas. They have 3 gorillas, which can mate and give birth. After the first year there are 7 gorillas. After the second year there are 11 gorillas. Suppose the gorillas continue to increase at the same rate. How long will it take for the Springfield Zoo to have 35 gorillas?

2-7**Practice: Skills**
Solving Equations**Solve each equation. Check your solution.**

1. $r + 1 = -5$

2. $h + 8 = 6$

3. $t - 3 = -11$

4. $p - 5 = 9$

5. $w + 9 = -9$

6. $x - 9 = -9$

7. $a + 7 = -7$

8. $m + 9 = -7$

9. $q - 4 = 5$

10. $b + 2 = 3$

11. $n - 11 = 1$

12. $r - 1 = -3$

13. $c + 6 = 1$

14. $v - 3 = -7$

15. $z + 3 = 0$

16. $s - 8 = -1$

17. $-1f = 11$

18. $\frac{r}{-1} = 22$

19. $8d = -16$

20. $\frac{r}{15} = 45$

21. $25k = -200$

22. $-3p = 18$

23. $7j = -63$

24. $\frac{y}{-10} = 10$

25. $\frac{x}{-8} = -1$

26. $5g = -20$

27. $\frac{p}{6} = 0$

28. $7y = 7$

29. $-6q = -30$

30. $-12c = -60$

31. $-9b = 90$

32. $-4k = -120$

33. $3x + 10 = 1$

34. $\frac{a}{5} + 8 = 9$

35. $8w - 12 = -4$

36. $\frac{r}{2} + 6 = 5$

37. $18 - 2q = 4$

38. $3j - 20 = 16$

39. $\frac{u}{12} - 8 = -8$

40. $7p + 11 = -31$

41. $12d + 15 = 3$

42. $4c + 20 = 0$

43. $\frac{n}{2} - 9 = -5$

44. $10b - 19 = 11$

45. $2h + 10 = -12$

46. $6k - 9 = 15$

47. $\frac{w}{-5} - 4 = -2$

3-1 Practice: Skills***Fractions***

Use a number line to determine which number is greater.

1. $\frac{2}{3} \bullet \frac{3}{4}$

2. $\frac{3}{8} \bullet \frac{6}{16}$

3. $\frac{5}{8} \bullet \frac{7}{12}$

4. $\frac{1}{2} \bullet \frac{6}{7}$

5. $\frac{3}{9} \bullet \frac{1}{3}$

6. $\frac{1}{6} \bullet \frac{9}{10}$

7. $\frac{5}{6} \bullet \frac{7}{8}$

8. $\frac{5}{8} \bullet \frac{5}{12}$

9. $\frac{4}{5} \bullet \frac{2}{3}$

10. $\frac{6}{7} \bullet \frac{4}{5}$

11. $\frac{5}{12} \bullet \frac{3}{16}$

12. $\frac{3}{4} \bullet \frac{2}{9}$

Write the additive inverse of each number.

13. $\frac{5}{7}$

14. $\frac{2}{15}$

15. $\frac{5}{12}$

16. $\frac{3}{10}$

17. $\frac{4}{9}$

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

Graph each fraction on a number line.

19. $\frac{1}{6}$

20. $\frac{7}{9}$

21. $\frac{9}{10}$

Order the fractions from least to greatest.

22. $\frac{3}{8}, \frac{2}{8}, \frac{5}{8}$

23. $\frac{1}{7}, \frac{2}{7}, \frac{3}{7}$

24. $\frac{2}{9}, \frac{4}{9}, \frac{5}{9}$

25. $\frac{4}{15}, \frac{2}{15}, \frac{13}{15}$

26. $\frac{11}{12}, \frac{5}{12}, \frac{3}{12}$

27. $\frac{7}{15}, \frac{3}{15}, \frac{5}{15}$

3-2**Practice: Skills*****Fractions and Mixed Numbers***

Draw a model for each mixed number.

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

2. $3\frac{3}{8}$

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

Write each improper fraction as a mixed number or a whole number.

4. $\frac{13}{2}$

5. $\frac{11}{6}$

6. $\frac{11}{8}$

7. $\frac{10}{3}$

8. $\frac{31}{8}$

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

10. $\frac{26}{9}$

11. $\frac{29}{6}$

12. $\frac{43}{5}$

13. $\frac{39}{7}$

14. $\frac{32}{3}$

15. $\frac{37}{4}$

16. $\frac{9}{5}$

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

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

19. $\frac{17}{8}$

20. $\frac{19}{6}$

21. $\frac{27}{27}$

22. $\frac{25}{2}$

23. $\frac{31}{7}$

24. $\frac{52}{9}$

25. $\frac{41}{3}$

26. $\frac{37}{5}$

27. $\frac{77}{8}$

3-3**Practice: Skills*****Factors and Simplifying Fractions*****Identify the common factors of each set of numbers.**

1. 12 and 20

2. 24 and 30

3. 18 and 27

4. 10 and 25

5. 6 and 21

6. 14 and 42

Find the GCF of each set of numbers.

7. 15 and 40

8. 16 and 36

9. 12 and 54

10. 24 and 64

11. 39 and 26

12. 35 and 63

13. 36 and 48

14. 35 and 28

15. 40 and 56

16. 56 and 14

17. 27 and 63

18. 88 and 66

Simplify each fraction.

19. $\frac{45}{75}$

20. $\frac{50}{200}$

21. $\frac{32}{50}$

22. $\frac{56}{64}$

23. $\frac{14}{35}$

24. $\frac{39}{45}$

25. $\frac{48}{66}$

26. $\frac{42}{45}$

27. $\frac{78}{130}$

3-4 Practice: Skills***Problem-Solving Strategy: Draw a Diagram***

Draw a diagram to solve.

- 1. HOMEWORK** Shantel is studying for her history test. After 20 minutes, she is $\frac{1}{4}$ of the way done. How much longer will she study?

- 2. RECIPES** Damon is making muffins. He has added $\frac{3}{4}$ of the ingredients. He has added 6 ingredients. How many more does he have to add to be finished?

- 3. TRAVEL** The Smithsons are going to Dallas, TX on vacation. They have traveled $\frac{1}{3}$ of the total distance. They have traveled 126 miles. How far is it from their house to Dallas?

- 4. PHYSICS** A ball is dropped from 256 feet above the ground. It bounces up $\frac{1}{4}$ as high as it fell. This is true for each successive bounce. What height will the ball reach on the third bounce?

- 5. SCHOOL** Mrs. Wright says that $\frac{2}{3}$ of her class has arrived for the day. Ten students have arrived. How many students are in her class?

- 6. TRAVEL** Jeremy walked $\frac{1}{4}$ of the way to school. He ran $\frac{1}{4}$ of the way to school. Jeremy then rode with his best friend the rest of the way. Suppose he walked 1.5 miles. How far did he ride with his friend?

3-5**Practice: Skills*****Multiplying Fractions*****Multiply.**

1. $\frac{3}{4} \cdot \frac{1}{2}$

2. $\frac{1}{3} \cdot \frac{2}{5}$

3. $\frac{1}{3} \cdot 6$

4. $\frac{2}{5} \cdot \frac{3}{7}$

5. $\frac{3}{8} \cdot 10$

6. $\frac{1}{6} \cdot \frac{3}{5}$

7. $\frac{2}{9} \cdot 3$

8. $\frac{9}{10} \cdot \frac{4}{5}$

9. $\frac{7}{8} \cdot \frac{2}{9}$

10. $11 \cdot \frac{3}{4}$

11. $\frac{5}{6} \cdot \frac{1}{4}$

12. $\frac{4}{9} \cdot \frac{2}{3}$

13. $\frac{7}{12} \cdot \frac{6}{11}$

14. $16 \cdot \frac{5}{12}$

15. $\frac{4}{9} \cdot \frac{1}{8}$

16. $\frac{1}{5} \cdot \frac{10}{11}$

17. $\frac{5}{12} \cdot \frac{3}{8}$

18. $\frac{1}{10} \cdot \frac{4}{7}$

19. $21 \cdot \frac{4}{7}$

20. $\frac{5}{9} \cdot 18$

21. $\frac{5}{6} \cdot \frac{8}{9}$

22. $\frac{1}{8} \cdot \frac{2}{3}$

23. $\frac{2}{9} \cdot \frac{7}{8}$

24. $\frac{5}{6} \cdot \frac{3}{11}$

25. $-\frac{4}{7} \cdot \frac{3}{10}$

26. $\frac{2}{9} \cdot \left(-\frac{3}{8}\right)$

27. $-\frac{3}{5} \cdot \left(-\frac{5}{9}\right)$

28. $\left(\frac{1}{4}\right)^3$

29. $\left(\frac{2}{3}\right)^2$

30. $\left(\frac{4}{5}\right)^3$

3-6 Practice: Skills

Dividing Fractions

Find the reciprocal of each number.

1. $\frac{1}{2}$

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

3. 7

4. $\frac{8}{11}$

5. 12

6. $\frac{9}{10}$

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

8. $\frac{3}{10}$

Divide. Write in simplest form.

9. $\frac{5}{6} \div \frac{1}{3}$

10. $\frac{9}{10} \div \frac{1}{2}$

11. $\frac{1}{2} \div \frac{3}{5}$

12. $8 \div \frac{4}{5}$

13. $\frac{7}{12} \div \frac{5}{6}$

14. $\frac{9}{10} \div \frac{1}{4}$

15. $\frac{3}{8} \div 9$

16. $\frac{9}{10} \div \frac{3}{4}$

17. $\frac{2}{5} \div \frac{4}{7}$

18. $15 \div \frac{5}{9}$

19. $\frac{6}{7} \div \frac{3}{11}$

20. $\frac{1}{9} \div \frac{5}{12}$

21. $\frac{5}{6} \div \frac{5}{12}$

22. $\frac{10}{11} \div 5$

23. $\frac{7}{9} \div \frac{1}{7}$

24. $\frac{6}{7} \div \frac{8}{9}$

25. $\frac{3}{5} \div \frac{9}{11}$

26. $5 \div \frac{4}{9}$

27. $-\frac{5}{8} \div \frac{3}{4}$

28. $\frac{7}{9} \div \left(-\frac{14}{15}\right)$

29. $-\frac{4}{5} \div \frac{8}{9}$

30. $\frac{2}{11} \div \frac{4}{9}$

31. $\frac{10}{11} \div 5$

32. $-4 \div \frac{3}{5}$

3-7**Practice: Skills*****Adding and Subtracting Fractions with Like Denominators***

Add or subtract. Write in simplest form.

1. $\frac{2}{9} + \frac{4}{9}$

2. $\frac{2}{5} + \frac{4}{5}$

3. $\frac{2}{3} - \frac{1}{3}$

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

5. $\frac{7}{8} - \frac{3}{8}$

6. $\frac{9}{12} + \frac{3}{12}$

7. $\frac{5}{6} - \frac{1}{6}$

8. $\frac{1}{6} + \frac{5}{6}$

9. $\frac{11}{12} - \frac{7}{12}$

10. $\frac{7}{8} + \frac{3}{8}$

11. $\frac{11}{10} - \frac{4}{10}$

12. $\frac{3}{8} + \frac{1}{8}$

13. $\frac{10}{11} - \frac{2}{11}$

14. $\frac{7}{9} + \frac{2}{9}$

15. $\frac{5}{6} + \frac{4}{6}$

16. $\frac{3}{10} - \frac{1}{10}$

17. $\frac{3}{10} + \frac{3}{10}$

18. $\frac{10}{6} + \frac{3}{6}$

19. $\frac{5}{8} - \frac{3}{8}$

20. $\frac{5}{7} - \frac{2}{7}$

21. $\frac{6}{7} + \frac{5}{7}$

22. How much is $\frac{2}{9}$ pound plus $\frac{1}{9}$ pound?23. How much longer is $\frac{3}{8}$ foot than $\frac{1}{8}$ foot?24. How much more than $\frac{1}{4}$ cup is $\frac{3}{4}$ cup?25. What is the sum of $\frac{2}{11}$, $\frac{7}{11}$, and $\frac{1}{11}$?

3-8 Practice: Skills***Adding Fractions with Unlike Denominators*****Add. Write in simplest form.**

1.
$$\begin{array}{r} \frac{2}{3} \\ + \frac{5}{6} \\ \hline \end{array}$$

2.
$$\begin{array}{r} \frac{5}{6} \\ + \frac{3}{4} \\ \hline \end{array}$$

3.
$$\begin{array}{r} \frac{1}{2} \\ + \frac{7}{8} \\ \hline \end{array}$$

4.
$$\begin{array}{r} \frac{3}{4} \\ + \frac{1}{8} \\ \hline \end{array}$$

5. $\frac{1}{5} + \frac{5}{6}$

6. $\frac{3}{4} + \frac{11}{12}$

7. $\frac{4}{5} + \frac{1}{2}$

8. $\frac{3}{5} + \frac{2}{3}$

9. $\frac{3}{5} + \frac{9}{10}$

10. $\frac{1}{3} + \frac{5}{7}$

11.
$$\begin{array}{r} \frac{1}{2} \\ + \frac{1}{3} \\ \hline \end{array}$$

12.
$$\begin{array}{r} \frac{1}{6} \\ + \frac{3}{10} \\ \hline \end{array}$$

13.
$$\begin{array}{r} \frac{3}{4} \\ + \frac{1}{6} \\ \hline \end{array}$$

14. $\frac{6}{7} + \frac{1}{3}$

15. $\frac{9}{10} + \frac{3}{5}$

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

17. $\frac{2}{5} + \frac{3}{4}$

18. $\frac{5}{12} + \frac{23}{24}$

19. $\frac{19}{20} + \frac{1}{4}$

20. $\frac{7}{10} + \frac{1}{5}$

3-9**Practice: Skills*****Subtracting Fractions with Unlike Denominators*****Subtract. Write in simplest form.**

1.
$$\begin{array}{r} \frac{2}{3} \\ - \frac{1}{6} \\ \hline \end{array}$$

2.
$$\begin{array}{r} \frac{4}{7} \\ - \frac{1}{2} \\ \hline \end{array}$$

3.
$$\begin{array}{r} \frac{1}{6} \\ - \frac{1}{12} \\ \hline \end{array}$$

4.
$$\frac{5}{8} - \frac{1}{4}$$

5.
$$\frac{11}{12} - \frac{3}{4}$$

6.
$$\frac{1}{2} - \frac{2}{5}$$

7.
$$\frac{3}{4} - \frac{1}{12}$$

8.
$$\frac{2}{3} - \frac{1}{4}$$

9.
$$\frac{11}{12} - \frac{1}{6}$$

10.
$$\begin{array}{r} \frac{11}{12} \\ - \frac{2}{3} \\ \hline \end{array}$$

11.
$$\begin{array}{r} \frac{7}{10} \\ - \frac{1}{2} \\ \hline \end{array}$$

12.
$$\begin{array}{r} \frac{3}{5} \\ - \frac{1}{4} \\ \hline \end{array}$$

13.
$$\begin{array}{r} \frac{6}{7} \\ - \frac{3}{4} \\ \hline \end{array}$$

14.
$$\frac{11}{12} - \frac{3}{4}$$

15.
$$\frac{7}{11} - \frac{1}{2}$$

16.
$$\frac{10}{11} - \frac{1}{2}$$

17.
$$\frac{5}{6} - \frac{1}{12}$$

18.
$$\frac{13}{15} - \frac{2}{3}$$

19.
$$\frac{33}{100} - \frac{1}{10}$$

20.
$$\frac{4}{5} - \frac{1}{8}$$

3-10 Practice: Skills***Fractions in Expressions and Equations*****Find each sum or difference. Write in simplest form.**

1. $\frac{a}{6} + \frac{4a}{6}$

2. $\frac{7c}{16} + \frac{7c}{16}$

3. $\frac{7x}{9} - \frac{7x}{9}$

4. $\frac{3m}{5} + \frac{8m}{5}$

5. $\frac{h}{6} + \frac{4h}{6}$

6. $\frac{5c}{22} + \frac{5c}{22}$

7. $\frac{4r}{9} + \frac{5r}{9}$

8. $\frac{5p}{9} - \frac{4p}{9}$

9. $\frac{6s}{t} + \frac{s}{t}$

Solve each equation. Check your solution.

10. $\frac{x}{10} = 3$

11. $7 = \frac{m}{4}$

12. $\frac{a}{5} = -11$

13. $-8 = \frac{t}{5}$

14. $\frac{3}{4}c = 12$

15. $-7 = -\frac{w}{6}$

16. $\frac{3}{5}y = 6$

17. $15 = \frac{3}{7}b$

18. $\frac{6}{7}c = 18$

19. $\frac{7}{3}x = \frac{2}{3}$

20. $\frac{11}{12} = \frac{3}{4}h$

21. $\frac{9}{14}y = \frac{3}{7}$

22. $\frac{2}{7} + p = -\frac{3}{4}$

23. $h + \frac{6}{11} = \frac{3}{22}$

24. $\frac{2}{3}m = \frac{20}{27}$

4-1**Practice: Skills*****Fractions and Decimals***

Write each repeating decimal using bar notation.

1. $0.7353535\dots$

2. $0.424242\dots$

3. $5.126126126\dots$

Write each fraction or mixed number as a decimal. Use bar notation if the decimal is a repeating decimal.

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

5. $\frac{19}{20}$

6. $3\frac{4}{5}$

7. $\frac{23}{50}$

8. $1\frac{5}{8}$

9. $\frac{19}{25}$

10. $4\frac{17}{37}$

11. $5\frac{3}{11}$

12. $\frac{17}{24}$

13. $6\frac{7}{32}$

14. $7\frac{9}{22}$

15. $1\frac{17}{48}$

Write each decimal as a fraction in simplest form.

16. 0.8

17. 0.52

18. 0.92

19. 0.48

20. 0.86

21. 0.76

4-2**Practice: Skills*****Adding and Subtracting Decimals*****Find each sum or difference.**

1.
$$\begin{array}{r} 0.581 \\ + 11 \\ \hline \end{array}$$

2.
$$\begin{array}{r} 4.78 \\ + 6 \\ \hline \end{array}$$

3.
$$\begin{array}{r} 9.6 \\ + 5.2 \\ \hline \end{array}$$

4.
$$\begin{array}{r} 7.8 \\ - 4.3 \\ \hline \end{array}$$

5.
$$\begin{array}{r} 16.79 \\ - 0.51 \\ \hline \end{array}$$

6.
$$\begin{array}{r} 1.02 \\ - 0.38 \\ \hline \end{array}$$

7.
$$\begin{array}{r} 20.1 \\ + 3.2 \\ \hline \end{array}$$

8.
$$\begin{array}{r} 0.86 \\ + 0.38 \\ \hline \end{array}$$

9.
$$\begin{array}{r} 3.84 \\ + 2.69 \\ \hline \end{array}$$

10.
$$\begin{array}{r} 4.17 \\ - 2.58 \\ \hline \end{array}$$

11.
$$\begin{array}{r} 47.06 \\ - 38.27 \\ \hline \end{array}$$

12.
$$\begin{array}{r} 96.293 \\ - 68.501 \\ \hline \end{array}$$

Find each sum or difference.

13. $8.5 + 0.5$

14. $8.3 + 7.9$

15. $5.21 + 4 + 0.2$

16. $3.4 + 3.2 - 6$

17. $0.485 + 9.32$

18. $362 - 145.9$

19. $19.4 - 7.86$

20. $4 + 8.5 + 2$

21. $8.3 + 5.41 + 3.2$

Simplify each expression.

22. $3x + 5 + 4x$

23. $5y + 3.2 + 2.5y$

24. $10.6 + 10.2z + 3z$

4-3**Practice: Skills*****Multiplying Decimals*****Multiply.**

1. $4.1 \cdot 7$

2. $3 \cdot 2.9$

3. $6.8 \cdot 7$

4. $3.15 \cdot 0.3$

5. $8.21 \cdot 4$

6. $0.76 \cdot 4.1$

7. $1.72 \cdot 6$

8. $0.34 \cdot 1.48$

9. $6.46 \cdot 0.91$

10. $2.93 \cdot 1.07$

11. $0.21 \cdot 4.23$

12. $6.23 \cdot 0.11$

13. $1.65 \cdot 1.38$

14. $0.51 \cdot 4.01$

15. $2.57 \cdot 2.63$

4-4**Practice: Skills*****Dividing Decimals*****Divide. Round to 3 decimal places if necessary.**

1. $9.2 \div 3$

2. $18.73 \div 9$

3. $0.07 \div 4$

4. $16.8 \div 2.4$

5. $40.8 \div 6.8$

6. $24.6 \div 8.2$

7. $50.4 \div 6.4$

8. $55.8 \div 6.6$

9. $36.8 \div 4.8$

10. $120.8 \div 30.2$

11. $258.5 \div 51.7$

12. $251.3 \div 35.9$

13. $0.2695 \div 3.5$

14. $8.8872 \div 9.2$

15. $21.8244 \div 5.2$

4-5**Practice: Skills*****Problem-Solving Strategy: Work Backward***

Solve. Use the work-backward strategy

- 1. GOVERNMENT** There are 99 members in the Ohio House of Representatives. All of them were present when a vote was taken on a piece of legislation. Suppose 6 members did not vote and 13 more voted “yes” than voted “no.” How many “no” votes were there?
- 2. MONEY** Jessie and Amar eat lunch at a restaurant and their bill is \$21.65. Amar gives the cashier a coupon for \$6 off their bill, and also hands the cashier two bills. He receives \$4.35 in change. What were the denominations of the two bills he gave the cashier?
- 3. AGE** Justine is 13 years younger than her uncle Stewart. Stewart is 18 years older than Justine’s sister, Julia. Julia’s mother is 8 year older than Stewart, and 28 years older than her youngest child, Jared. If Jared is 12 years old, how old is Justine?
- 4. NUMBER THEORY** A number is divided by 6. Then 7 is added to the divisor. After dividing by 4, the result is 4. What is the number?
- 5. COMPACT DISCS** Carmella borrowed half as many CDs from the library as her friend Ariel. Ariel borrowed 2 more than Juan, but four less than Sierra. Sierra borrowed 12 CDs. How many did each person borrow?
- 6. TIME** Ashish needs to leave for the bus stop 15 minutes earlier than his friend Rami. Rami leaves five minutes later than Susan, but 10 minutes earlier than Raphael. Raphael leaves for the bus stop at 8:15. What time does Ashish need to leave?

4-6 Practice: Skills***Decimals in Expressions and Equations*****Solve each equation. Check your solution.**

1. $x + 2.62 = 6.37$

2. $y - 3.16 = 7.92$

3. $-3.38 = r - 9.76$

4. $s + 0.625 = 0.875$

5. $-0.25 = x - 0.75$

6. $-0.8 + z = 0.1$

7. $3.4c = 6.8$

8. $-1.56 = 0.26w$

9. $12.8y = 6.4$

10. $0.75x = 9$

11. $0.65 = 0.05a$

12. $-0.4s = 0.48$

13. $-0.6 = 0.3t$

14. $-0.04w = -0.96$

15. $5.1 = -1.7r$

16. $z - (-3.2) = 3.69$

17. $-2.11 = w - (-5.81)$

18. $\frac{w}{2.6} = 3.5$

19. $-\frac{x}{1.8} = 7.2$

20. $2.25y = 3.375$

21. $-2.4f = -3.2$

22. $1.5d = 0.5625$

23. $-7g = -6.58$

24. $-2.2 = c - (-0.8)$

5-1**Practice: Skills*****Exponents*****Write each expression using exponents.**

1. $2 \cdot 2 \cdot 2 \cdot 2$

2. $9 \cdot 9$

3. $7 \cdot 7 \cdot 7 \cdot 7 \cdot 7 \cdot 7$

4. $x \cdot x \cdot x$

5. $c \cdot c \cdot c \cdot c \cdot c$

6. $s \cdot s \cdot s \cdot s \cdot s \cdot s \cdot s$

7. $5 \cdot 5 \cdot 5 \cdot 3 \cdot 3$

8. $4 \cdot 4 \cdot 4 \cdot 4 \cdot 6 \cdot 6 \cdot 6$

9. $8 \cdot 8 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 8$

10. $a \cdot a \cdot b \cdot a \cdot b \cdot a \cdot a$

11. $m \cdot n \cdot n \cdot n \cdot m \cdot n$

12. $y \cdot x \cdot x \cdot y \cdot x \cdot y \cdot y$

Simplify.

13. 4^3

14. 2^5

15. 8^3

16. 5^4

17. 2^8

18. $2^3 \cdot 5^2$

19. $4^2 \cdot 3^4$

20. $2^6 \cdot 6^2$

21. $3^3 \cdot 7^3$

22. $\frac{6^5}{6^2}$

23. $\frac{12h^2y}{4hy}$

24. $\frac{24x^4y^2}{8x^2y}$

5-2 Practice: Skills

Integer Exponents

Write each expression using a positive exponent.

1. 3^{-4}

2. 8^{-7}

3. 10^{-4}

4. $(-2)^{-6}$

5. $(-40)^{-3}$

6. $(-17)^{-12}$

7. n^{-10}

8. b^{-8}

9. q^{-5}

10. m^{-4}

11. v^{-11}

12. p^{-2}

Write each fraction as an expression using a negative exponent other than -1 .

13. $\frac{1}{8^2}$

14. $\frac{1}{10^5}$

15. $\frac{1}{2^3}$

16. $\frac{1}{6^7}$

17. $\frac{1}{17^4}$

18. $\frac{1}{21^2}$

19. $\frac{1}{3^7}$

20. $\frac{1}{9^2}$

21. $\frac{1}{3^2}$

22. $\frac{1}{121}$

23. $\frac{1}{25}$

24. $\frac{1}{36}$

Find each quotient. Rewrite using positive exponents.

25. $\frac{y^{-2}}{y^4}$

26. $\frac{z^{-2}}{z^{-2}}$

27. $\frac{x^{-8}}{x^{-2}}$

28. $\frac{y^{-5}}{y^{-3}}$

29. $\frac{z^{-3}}{z^3}$

30. $\frac{y^{-1}}{y}$

31. $\frac{z^{-4}}{z^{-2}}$

32. $\frac{5^3}{5^{-2}}$

33. $\frac{x^{-99}}{x^{-1}}$

34. $(x^2y)^3$

35. $(xy^3z)^5$

36. $(m^2np^4)^2$

5-4 Practice: Skills**Roots****Find each value.**

1. $\sqrt{1}$

2. $\sqrt{9}$

3. $\sqrt{25}$

4. $\sqrt{49}$

5. $\sqrt{64}$

6. $\sqrt{169}$

7. $-\sqrt{36}$

8. $-\sqrt{81}$

9. $-\sqrt{64}$

10. $-\sqrt{169}$

11. $-\sqrt{196}$

12. $-\sqrt{121}$

13. $\sqrt{225}$

14. $\sqrt{441}$

15. $\sqrt{625}$

16. $\sqrt{289}$

17. $\sqrt{324}$

18. $\sqrt{8100}$

19. $\sqrt{2.25}$

20. $\sqrt{0.16}$

21. $\sqrt{3.24}$

22. $\sqrt{1.69}$

23. $\sqrt{0.04}$

24. $\sqrt{0.09}$

25. $\sqrt{0.81}$

26. $-\sqrt{0.64}$

27. $-\sqrt{0.49}$

28. $-\sqrt{0.81}$

29. $-\sqrt{1.21}$

30. $-\sqrt{0.25}$

ALGEBRA Solve each equation.

31. $s^2 = 81$

32. $t^2 = 36$

33. $x^2 = 49$

34. $256 = z^2$

35. $900 = y^2$

36. $1,024 = h^2$

37. GARDENING Moesha has 196 pepper plants that she wants to plant in square formation. How many pepper plants should she plant in each row?

38. RESTAURANTS A new restaurant has ordered 64 tables for its outdoor patio. The manager arranges the tables in a square formation. How many will be in each row?

5-5**Practice: Skills*****Simplifying and Evaluating Expressions***

Evaluate each expression if $g = 3$, $h = -1$, and $m = 9$.

1. g^5
2. $5g^2$
3. $g^2 - m$
4. hm^2
5. $g^3 + 2h$
6. $m + hg^3$

Evaluate each expression if $b = 8$, $c = 2$, and $d = -3$.

7. 4^c
8. c^0
9. b^3
10. $c^3 \cdot 3^c$
11. 3^c
12. c^4
13. $c^2 + d$
14. $2b^2$
15. $b^2 + c^3$
16. d^2
17. d^3
18. $b^2 + d^3$
19. b^2d
20. $(b - c)^2$

5-6 Practice: Skills**Comparing and Ordering Rational Numbers**

Replace each ● with $<$, $>$, or $=$ to make a true sentence.

1. $\frac{1}{2} \bullet \frac{3}{4}$

2. $\frac{1}{3} \bullet \frac{1}{6}$

3. $\frac{2}{5} \bullet \frac{3}{10}$

4. $\sqrt{9} \bullet 2.7$

5. $\sqrt{9} \bullet 3.9$

6. $5\frac{2}{5} \bullet \sqrt{36}$

7. $2\frac{3}{10} \bullet \sqrt{4}$

8. $\sqrt{16} \bullet 3.\bar{1}$

9. $8.\bar{2} \bullet 8\frac{2}{9}$

10. $4.72 \bullet 4\frac{10}{13}$

11. $-2\frac{7}{15} \bullet -2.45$

12. $5.25 \bullet 5.\bar{25}$

13. $-1.62 \bullet -1\frac{5}{8}$

14. $11\frac{4}{9} \bullet 11.\bar{4}$

15. $-1.\bar{27} \bullet -1.2\bar{7}$

Order each set of rational numbers from least to greatest.

16. $0.3, 0.2, \frac{1}{3}, \frac{2}{9}$

17. $1\frac{2}{5}, 1\frac{2}{3}, 1.55, 1.67$

18. $2.7, 2\frac{1}{7}, 3.13, 1\frac{9}{10}$

19. $\frac{1}{4}, -1.7, 0.2, -1\frac{3}{4}$

20. $-2.21, -2.09, -2\frac{1}{9}, -1\frac{10}{11}$

21. $-3.1, 2.75, 1\frac{7}{8}, -\frac{2}{3}$

22. $\sqrt{16}, \sqrt{9}, 2.75, 2.\bar{8}$

23. $5.01, 5.0\bar{1}, 5.\bar{01}, \sqrt{36}$

24. $-\sqrt{9}, \sqrt{16}, -3.5, 3.5$

25. $-3\frac{1}{4}, -4\frac{1}{8}, -3.65, -3\frac{4}{11}, -4.05$

6-1 Practice: Skills

Ratios and Rates

Write each ratio as a fraction in simplest form.

1. 3 sailboats to 6 motorboats
2. 4 tulips to 9 daffodils
3. 5 baseballs to 25 softballs
4. 2 days out of 8 days
5. 6 poodles out of 18 dogs
6. 10 yellow eggs out of 12 colored eggs
7. 12 sheets of paper out of 28
8. 18 hours out of 24 hours
9. 16 elms out of 20 trees
10. 15 trumpets to 9 trombones
11. 5 ducks to 30 geese
12. 14 lions to 10 tigers
13. 6 sodas out of 16 drinks
14. 20 blue jays out of 35 birds

Write each rate as a unit rate.

15. 14 hours in 2 weeks
16. 36 pieces of candy for 6 children
17. 8 teaspoons for 4 cups
18. 8 tomatoes for \$2
19. \$28 for 4 hours
20. 150 miles in 3 hours
21. \$18 for 3 CDs
22. 48 logs on 6 trucks
23. Write the ratio *21 wins to 9 losses* as a fraction in simplest form.
24. Write the ratio *\$12 dollars for 3 tickets* as a unit rate.

6-2**Practice: Skills*****Fractions, Decimals, and Percents***

Write each percent as a fraction in simplest form.

1. 18%

2. 67.5%

3. 21.25%

4. 87.5%

5. $31\frac{1}{4}\%$

6. 17.5%

7. $18\frac{3}{4}\%$

8. $68\frac{3}{4}\%$

9. 7.5%

10. 12.5%

11. 36.75%

12. $5\frac{1}{2}\%$

Write each fraction as a percent. Round to the nearest hundredth if necessary.

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

14. $\frac{3}{8}$

15. $\frac{2}{18}$

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

17. $\frac{7}{9}$

18. $\frac{21}{50}$

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

20. $\frac{40}{42}$

21. $\frac{7}{16}$

22. $\frac{64}{125}$

23. $\frac{11}{12}$

24. $\frac{11}{15}$

6-3**Practice: Skills*****Proportions and Proportional Reasoning*****Determine whether each pair of ratios forms a proportion.**

1. $\frac{1}{5}, \frac{4}{20}$

2. $\frac{3}{8}, \frac{12}{32}$

3. $\frac{4}{5}, \frac{9}{10}$

4. $\frac{12}{20}, \frac{18}{30}$

5. $\frac{3}{4}, \frac{27}{36}$

6. $\frac{10}{18}, \frac{2}{9}$

7. $\frac{4}{9}, \frac{2}{3}$

8. $\frac{15}{18}, \frac{10}{12}$

9. $\frac{15}{24}, \frac{3}{8}$

10. $\frac{36}{72}, \frac{50}{100}$

11. $\frac{10}{8.4}, \frac{5}{4.2}$

12. $\frac{12}{4.8}, \frac{9}{3.2}$

ALGEBRA Solve each proportion.

13. $\frac{8}{4} = \frac{t}{8}$

14. $\frac{n}{9} = \frac{4}{18}$

15. $\frac{3}{v} = \frac{12}{32}$

16. $\frac{25}{60} = \frac{s}{12}$

17. $\frac{21}{28} = \frac{3}{w}$

18. $\frac{c}{12} = \frac{5}{6}$

19. $\frac{4}{r} = \frac{5}{20}$

20. $\frac{12}{18} = \frac{m}{81}$

21. $\frac{2}{9} = \frac{6}{k}$

22. $\frac{h}{35} = \frac{3}{7}$

23. $\frac{3}{16} = \frac{u}{40}$

24. $\frac{6}{a} = \frac{1}{3}$

25. $\frac{e}{9.5} = \frac{6.4}{7.6}$

26. $\frac{2.7}{3.0} = \frac{3.6}{x}$

27. $\frac{1.68}{w} = \frac{7}{12}$

6-4 Practice: Skills***The Percent Proportion***

Find each number. Round to the nearest tenth if necessary.

1. 50 is 20% of what number?
2. What percent of 20 is 4?
3. What number is 70% of 250?
4. 10 is 5% of what number?
5. What number is 45% of 180?
6. 40% of what number is 82?
7. What percent of 90 is 36?
8. 60 is 25% of what number?
9. What number is 32% of 1,000?
10. What percent of 125 is 5?
11. 73 is 20% of what number?
12. 57% of 109 is what number?
13. What percent of 185 is 35?
14. 25 is what percent of 365?
15. 85% of 190 is what number?
16. 12.5 is 25% of what number?
17. What percent of 128 is 24?
18. 5.25% of 170 is what number?
19. What is 82% of 230?
20. What percent of 49 is 7?

6-5 Practice: Skills***Problems Involving Percents*****Find the discounted selling price for each item to the nearest cent.**

1. suit: \$200, 50% discount
2. tire: \$80, 20% discount
3. sport bag: \$40, 30% discount
4. music player: \$120, 25% discount
5. grill: \$140, 15% discount
6. microwave: \$109, 20% discount

Find the sale price of each item to the nearest cent.

7. shoes: \$70, 10% off
8. artwork: \$250, 20% off
9. speakers: \$180, 30% off
10. bicycle: \$320, 25% off
11. antique chest: \$179, 15% off
12. pendant: \$93.50, 5% off

Find the simple interest to the nearest cent.

13. \$500 at 4% for 2 years
14. \$800 at 9% for 4 years
15. \$350 at 6.2% for 3 years
16. \$280 at 5.5% for 4 years

Find the total amount in each account to the nearest cent.

17. \$200 at 5% for 3 years
18. \$700 at 6% for 2 years
19. \$850 at 4% for 3 years
20. \$350 at 8% for 2 years

Find each percent of change. Round to the nearest tenth of a percent if necessary. State whether the percent of change is an *increase* or a *decrease*.

- | | | | |
|-------------------------------|-------------------------------|------------------------------|-----------------------------|
| 21. original: 4
new: 6 | 22. original: 35
new: 28 | 23. original: 80
new: 52 | 24. original: 45
new: 63 |
| 25. original: 120
new: 132 | 26. original: 210
new: 105 | 27. original: 84
new: 111 | 28. original: 91
new: 77 |

6-6 Practice: Skills***Direct Variation***

For Exercises 1–3, determine whether each linear function is a direct variation. If so, state the constant of variation.

1.

Price x	\$5	\$10	\$15	\$20
Tax y	\$0.41	\$0.82	\$1.23	\$1.64

2.

Hours x	11	12	13	14
Distance y (miles)	154	167	180	194

3.

Age x	8	9	10	11
Grade y	3	4	5	6

For Exercises 4–12, y varies directly with x . Write an equation for the direct variation. Then find each value.

4. If $y = 8$ when $x = 3$, find y when $x = 45$.

5. If $y = -4$ when $x = 10$, find y when $x = 2$.

6. If $y = 27$ when $x = 8$, find y when $x = 11$.

7. Find y when $x = 12$ if $y = 2$ when $x = 5$.

8. Find y when $x = 3$ if $y = -4$ when $x = -9$.

9. Find y when $x = -6$ if $y = 15$ when $x = -5$.

10. If $y = 20$ when $x = 8$, what is the value of x when $y = -2$?

11. If $y = -30$ when $x = 15$, what is the value of x when $y = 60$?

12. If $y = 42$ when $x = 15$, what is the value of x when $y = 70$?

6-7 Practice: Skills***Problem-Solving Strategy: Make a Table***

For Exercises 1–5, use the ratio table given to solve each problem.

1. **BAKING** A recipe for 1 apple pie calls for 6 cups of sliced apples. How many cups of sliced apples are needed to make 4 apple pies?

Number of Pies	1			4
Cups of Sliced Apples	6			■

2. **BASEBALL CARDS** Justin bought 40 packs of baseball cards for a discounted price of \$64. If he sells 10 packs of baseball cards to a friend at cost, how much should he charge?

Number of Baseball Card Packs	10			40
Cost in Dollars	■			64

3. **SOUP** A recipe that yields 12 cups of soup calls for 28 ounces of beef broth. How many ounces of beef broth do you need to make 18 cups of the soup?

Number of Cups		12	18
Ounces of Beef Broth		28	■

4. **ANIMALS** At a dog shelter, a 24-pound bag of dog food will feed 36 dogs a day. How many dogs would you expect to feed with a 16-pound bag of dog food?

Pounds of Dog Food	16	24	
Number of Dogs Fed	■	36	

5. **AUTOMOBILES** Mr. Fink's economy car can travel 420 miles on a 12-gallon tank of gas. Use a ratio table to determine how many miles he can travel on 8 gallons.

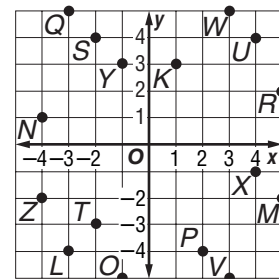
Miles	420		■
Gallons	12		8

7-1

Practice: Skills

The Coordinate Plane

For Exercises 1–8, use the coordinate plane at the right. Identify the point for each ordered pair.

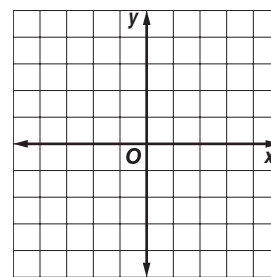


- | | |
|--------------|---------------|
| 1. $(-2, 4)$ | 2. $(-2, -3)$ |
| 3. $(4, 4)$ | 4. $(3, -5)$ |
| 5. $(3, 5)$ | 6. $(4, -1)$ |
| 7. $(-1, 3)$ | 8. $(-4, -2)$ |

For Exercises 9–16, use the coordinate plane above. Write the ordered pair that names each point. Then identify the quadrant where each point is located.

- | | |
|--------------|--------------|
| 9. <i>K</i> | 10. <i>L</i> |
| 11. <i>M</i> | 12. <i>N</i> |
| 13. <i>O</i> | 14. <i>P</i> |
| 15. <i>Q</i> | 16. <i>R</i> |

Graph and label each point on the coordinate plane at the right.



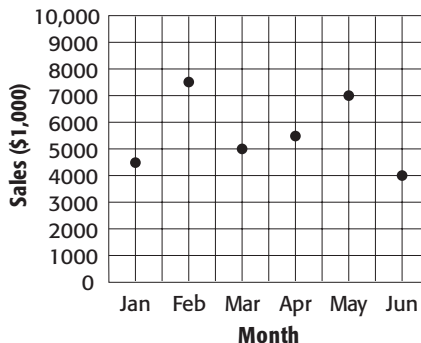
- | | |
|-----------------|-----------------|
| 17. $A(-5, 2)$ | 18. $I(2, 1)$ |
| 19. $J(1, -3)$ | 20. $B(-5, -1)$ |
| 21. $C(3, 3)$ | 22. $K(-1, 2)$ |
| 23. $L(0, -1)$ | 24. $D(2, -5)$ |
| 25. $E(3, -2)$ | 26. $M(-4, -5)$ |
| 27. $N(1, 5)$ | 28. $F(-2, 5)$ |
| 29. $G(-1, -4)$ | 30. $O(5, -5)$ |

7-2 Practice: Skills

Problem-Solving Strategy: Draw a Graph

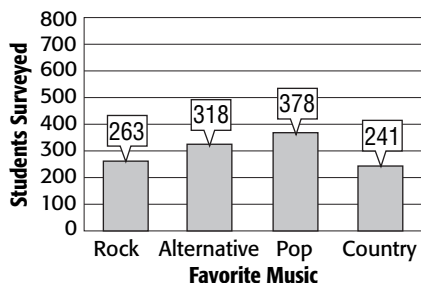
For Exercises 1–3, use the graph at the right. The graph shows the monthly sales for Wilson’s Flower Shop.

1. During which month were sales highest?
2. During which month were sales lowest?
3. Between which two months did sales increase the most?



For Exercises 4–8, use the graph at the right. The graph shows the results of a survey of students’ favorite types of music.

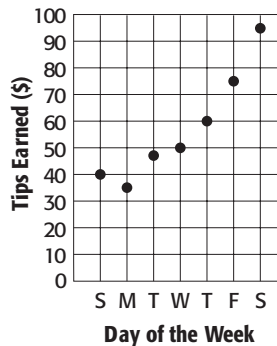
4. Which type of music received the most votes?
5. How many more votes did alternative receive than rock?
6. How many total students were surveyed?



7. How many more students voted for pop than country?
8. The survey was expanded to 6,000 students. About how many students voted for alternative as their favorite type of music?

For Exercises 9–12, use the graph at the right. Each point on the graph shows the amount in tips that Rachael received and the day that the tips were earned.

9. What was the lowest amount that Rachael was tipped?
10. What was the highest total amount that Rachael was tipped in one day?
11. On which day were Rachael’s tips highest overall?

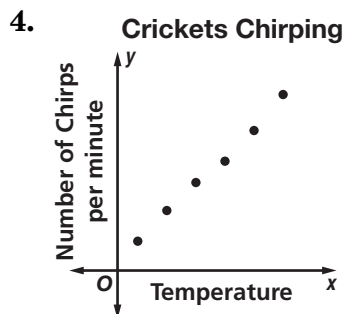
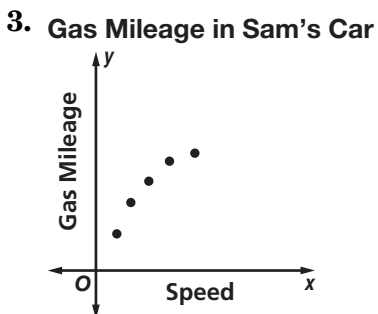
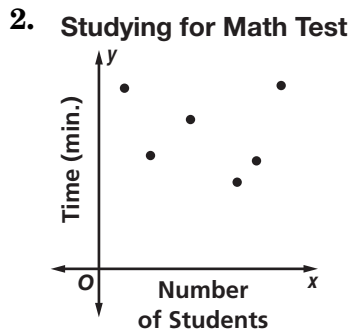
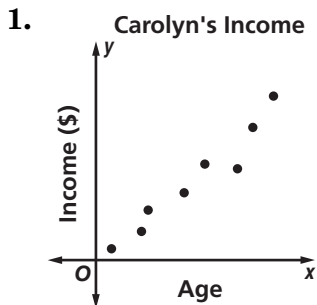


7-3

Practice: Skills

Relationships Involving Equal Ratios

Determine whether each data set shows a *positive*, a *negative*, or *no* relationship. Then describe the relationship between the data sets.



Make a graph to find the answer.

5. **TEMPERATURE** The chart to the right shows the average December temperatures in Fahrenheit over four years. Predict the average temperature for the next year.

December Temperatures (F°)			
2002	2003	2004	2005
22°	17°	18°	16°

6. **POPULATION** Every five years the population of your neighborhood is recorded. What do you predict the population will be in 2010?

Neighborhood Population		
1995	2000	2005
2,072	2,250	2,376

7-4**Practice: Skills*****Measures as Rates and Products***

Express each ratio as a unit rate. Round to the nearest tenth or nearest cent, if necessary.

1. \$9 for 6 cans of soup
2. \$39 for a case of 75 bananas
3. 108 miles in 6 days
4. 51 meters in 8 seconds
5. 21 new pairs of sneakers in 7 years
6. 52 feet for 8 costumes
7. 40 sneezes in 20 minutes
8. \$2702 from 28 people

Convert each rate using dimensional analysis.

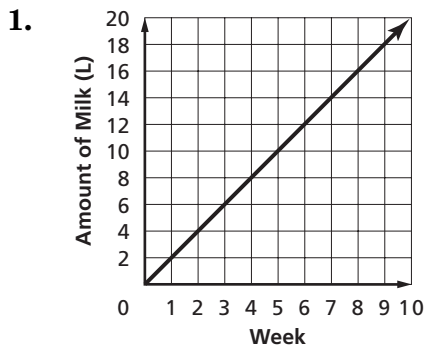
9. $12 \text{ m/min} = \underline{\quad?} \text{ cm/s}$
10. $8 \text{ qt/min} = \underline{\quad?} \text{ gal/h}$
11. $44 \text{ yd/s} = \underline{\quad?} \text{ mi/h}$
12. $10 \text{ c/min} = \underline{\quad?} \text{ qt/h}$
13. $32 \text{ ft/h} = \underline{\quad?} \text{ yd/day}$
14. $56 \text{ mi/h} = \underline{\quad?} \text{ ft/min}$
15. $40 \text{ cm/s} = \underline{\quad?} \text{ m/min}$
16. $180 \text{ in./min} = \underline{\quad?} \text{ yd/h}$
17. A group of 4 friends travel 500 miles together. How many passenger-miles is that?
18. A scooter travels 7 miles in 14 minutes. How fast did the scooter travel?
19. A family of 8 travels 120 miles to a festival. How many passenger-miles is that?
20. A class of 24 students attend 4 all day field trips for history class. How many student-days did they attend?

7-5

Practice: Skills

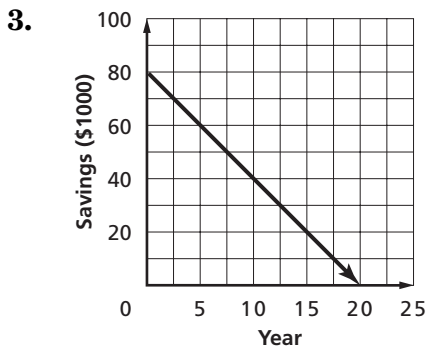
Slope

Find the slope.



2.

Year	Salary (\$)
x	y
1	21,000
2	23,500
3	26,000
4	28,500

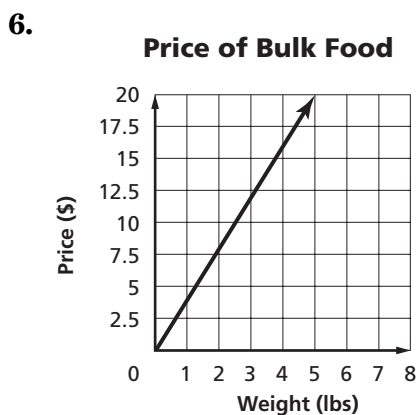


4.

Month	Number of Employees
x	y
0	0
2	22
4	44
6	66

5.

Time (min)	Temperature (°C)
x	y
0	9
1	23
2	37
3	51
4	65

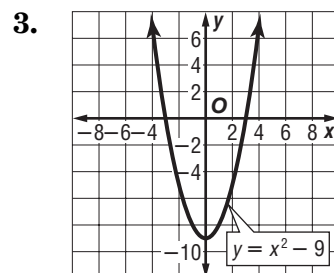
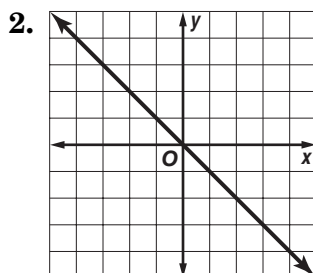
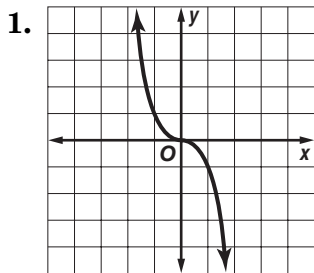


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7-6 Practice: Skills

Linear Functions

Determine whether each graph, equation, or table represents a *linear* or *nonlinear* function. Explain.



4.

x	y
1	8
2	5
3	2

5.

x	y
6	1
12	3
18	6

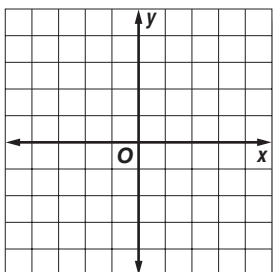
6.

x	y
20	-4
15	-2
10	0

Complete each input-output table. Use the table to graph.

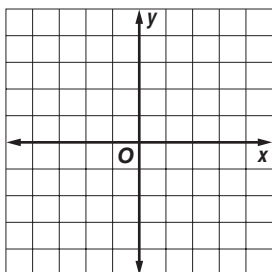
7. $y = x + 2$

x	$x + 2$	y
-1		
0		
1		
2		



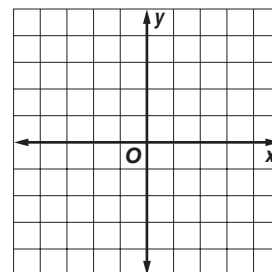
8. $y = x - 3$

x	$x - 3$	y
-2		
-1		
2		
3		



9. $y = 2x + 8$

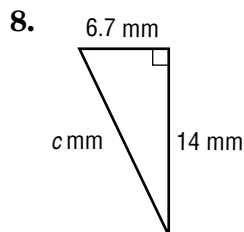
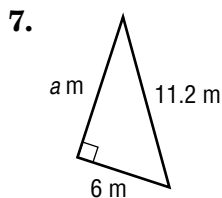
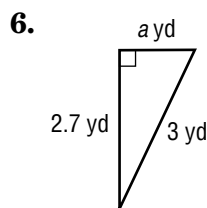
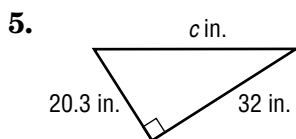
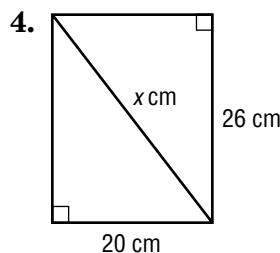
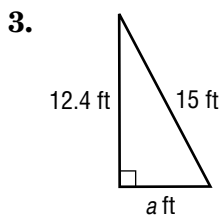
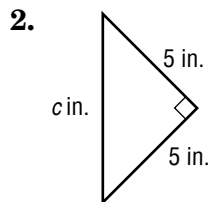
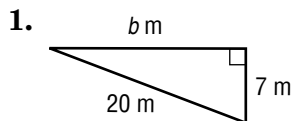
x	$2x + 8$	y
-3		
-1		
0		
4		



7-7 Practice: Skills

The Pythagorean Theorem

Find the missing measure of each right triangle. Round to the nearest tenth if necessary.



9. $a = 15 \text{ cm}, b = 20 \text{ cm}$

10. $a = 2 \text{ yd}, b = 12 \text{ yd}$

11. $a = 13 \text{ in.}, c = 16.5 \text{ in.}$

12. $b = 8 \text{ mm}, c = 17 \text{ mm}$

13. $a = 1.3 \text{ ft}, b = 4.6 \text{ ft}$

14. $a = 14.7 \text{ m}, c = 23 \text{ m}$

Determine whether each triangle with the given side lengths is a right triangle. Write *yes* or *no*.

15. 10 ft, 24 ft, 26 ft

16. 5 in., 8 in., 9 in.

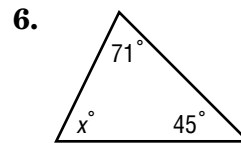
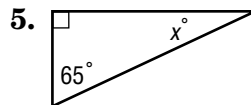
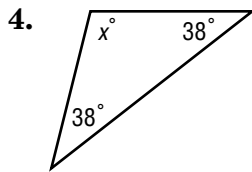
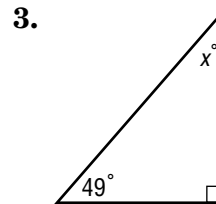
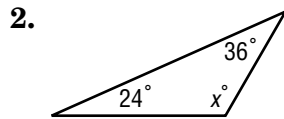
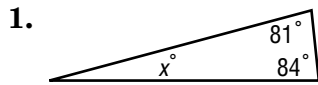
17. 6 cm, 9 cm, 12 cm

18. 4.5 mm, 6.0 mm, 7.5 mm

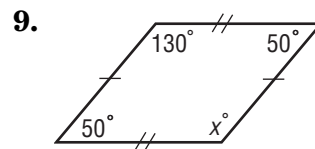
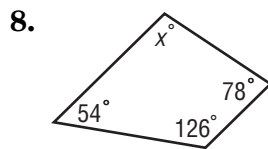
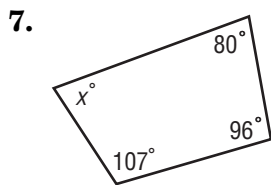
8-1 Practice: Skills

Triangles and Quadrilaterals

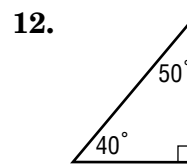
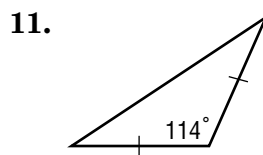
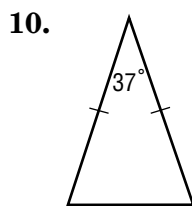
Find the missing measure in each triangle. Then classify the triangle as *acute*, *right*, or *obtuse*.



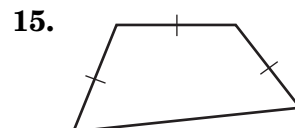
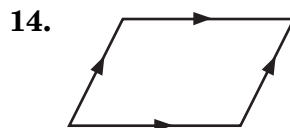
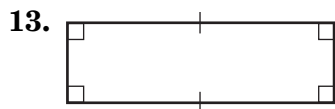
ALGEBRA Find the missing angle measure in each quadrilateral.



Classify each triangle by its angles and by its sides.



Classify each quadrilateral using the name that best describes it.



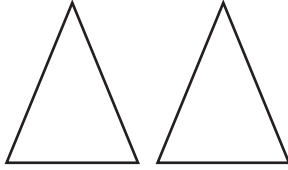
8-2

Practice: Skills

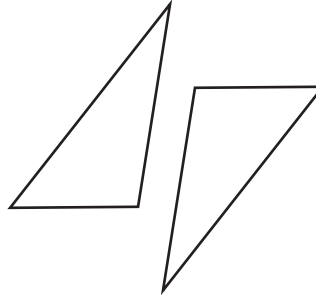
Congruency and Similarity

Tell whether each pair of figures is *similar*, *congruent*, or *neither*.

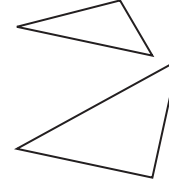
1.



2.

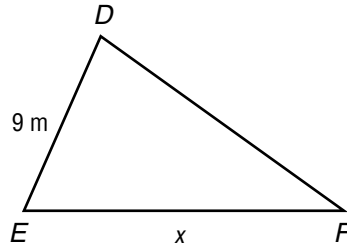
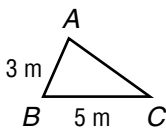


3.

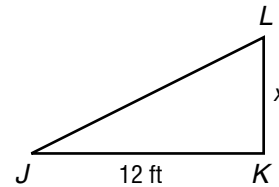
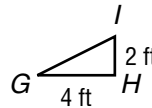


Find the value of x in each pair of similar figures.

4.

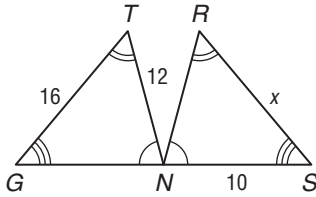


5.

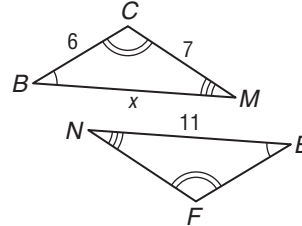


Find the value of x for each pair of congruent triangles.

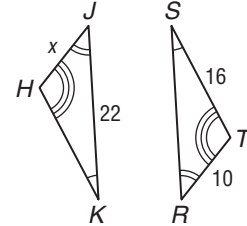
6.



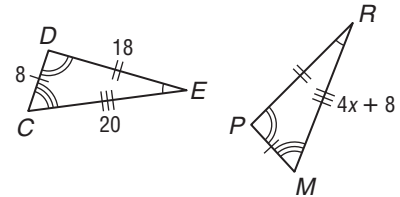
7.



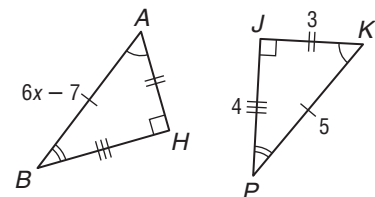
8.



9. ALGEBRA If $\triangle DEC \cong \triangle PRM$, what is the value of x ?



10. ALGEBRA If $\triangle AHB \cong \triangle KJP$, what is the value of x ?

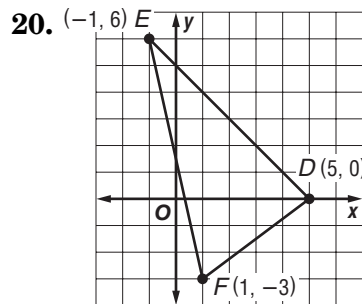
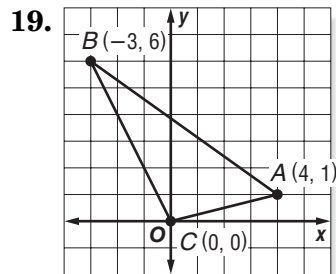


8-3**Practice: Skills****Coordinate Geometry**

Find the distance between each pair of points. Round to the nearest tenth, if necessary.

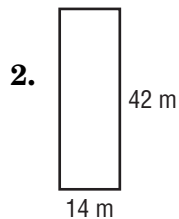
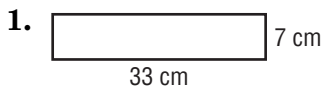
1. $A(2, 4), B(1, 3)$
2. $P(5, 10), Q(-1, 1)$
3. $G(3, -1), H(5, 6)$
4. $C(-2, -6), D(-7, 1)$
5. $E(-6, 2), F(4, 1)$
6. $J(-5, -3), K(4, -2)$
7. $M(-5, -5), N(3, -4)$
8. $V(4, 7), W(1, 6)$
9. $X(4, 6), Y(-3, -7)$
10. $R(0, 0), S(-1, -1)$
11. $T(7, 3), U(-2, -2)$
12. $A(6, 2), B(1, 3)$
13. $V(2, -6), W(4, -7)$
14. $C(6, 2), D(4, 7)$
15. $X(7, 8), Y(-7, 1)$
16. $E(7, 3), F(-1, 4)$
17. $A(5, 10), B(-4, -3)$
18. $G(-6, 2), H(2, 4)$

GEOMETRY Find the perimeter of each figure. Round to the nearest tenth.



GEOMETRY The coordinates of the vertices of a triangle are given. Find the perimeter of each triangle. Round to the nearest tenth, if necessary.

21. $J(4, 5), K(-2, 2),$ and $L(-4, 4)$
22. $E(3, 5), F(4, 8),$ and $G(-1, 6)$
23. $X(8, 1), Y(3, 3),$ and $Z(5, -3)$
24. $A(-3, 5), B(-3, -1),$ and $C(7, -1)$

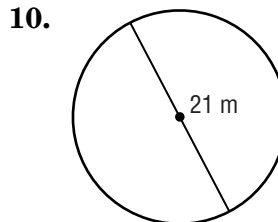
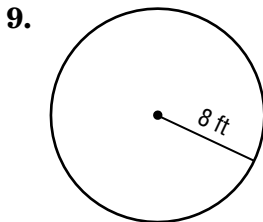
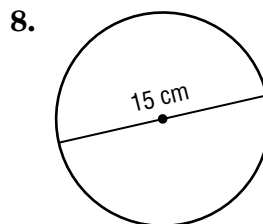
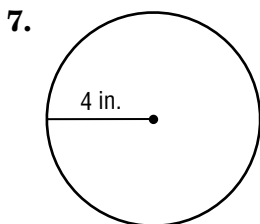
8-4 Practice: Skills**Perimeter****Find the perimeter of each figure.**

3. $\ell = 8 \text{ ft}, w = 5 \text{ ft}$

4. $\ell = 3.5 \text{ m}, w = 2 \text{ m}$

5. $\ell = 8 \text{ yd}, w = 4\frac{1}{3} \text{ yd}$

6. $\ell = 29 \text{ cm}, w = 7.3 \text{ cm}$

Find the circumference of each circle. Use 3.14 for π . Round to the nearest tenth if necessary.

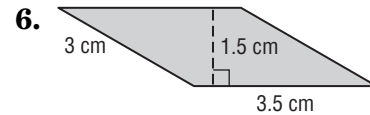
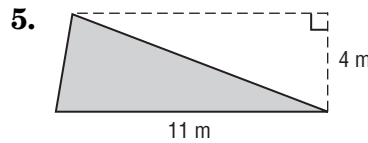
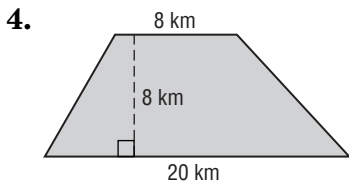
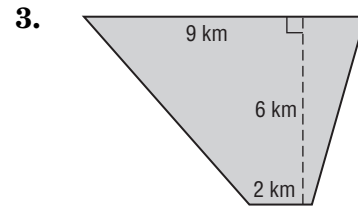
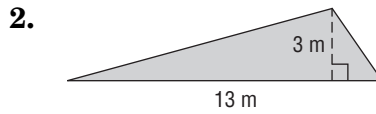
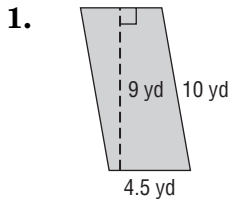
11. radius = 3 km

12. radius = 46 cm

8-5 Practice: Skills

Area

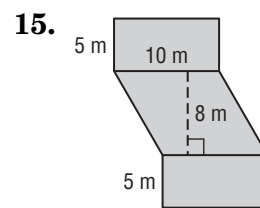
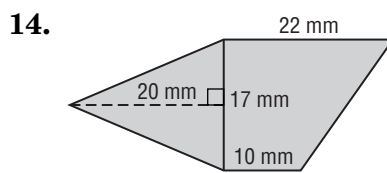
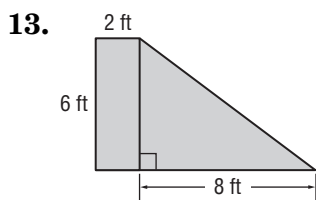
Find the area of each figure.



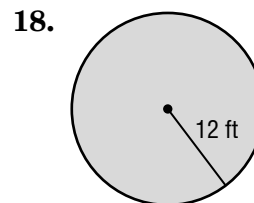
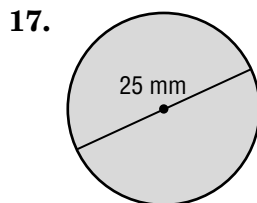
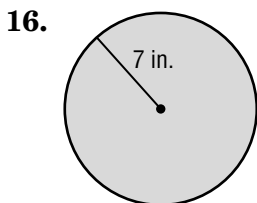
Find the area of each figure described.

- 7. triangle: base, 11 m; height, 3 m
- 8. parallelogram: base, 8 cm; height, 9.5 cm
- 9. trapezoid: height, 12 yd; bases, 4 yd, 7 yd
- 10. parallelogram: base, 6.5 ft; height, 12 ft
- 11. trapezoid: height, 10 m; bases, 3 m, 6 m
- 12. triangle: base, 7 km; height, 5 km

Find the area of each figure.



Find the area of each circle. Round to the nearest tenth.



- 19. radius = 2.6 cm
- 20. radius = 14.3 in.
- 21. diameter = $5\frac{1}{2}$ yd

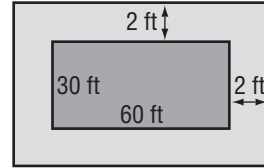
8-6

Practice: Skills

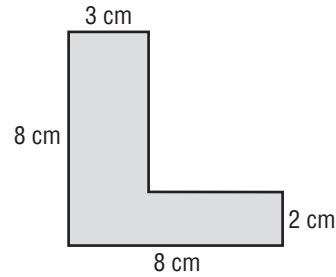
Problem-Solving Strategy: Make a Model

Use a model to solve.

1. **POOL** Find the area of the sidewalk around the pool shown below.



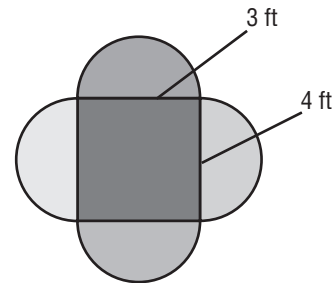
2. **GEOMETRY** Find the area of the shape shown.



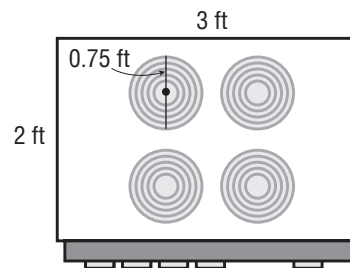
3. **TABLES** A picnic area has 21 small tables that can be pushed together to form one long table for large group. Each small table can seat 4 people per side. How many people can be seated at the combined tables?



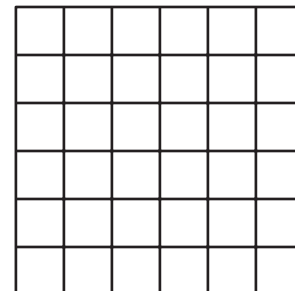
4. **STAINED GLASS** Find the area of the stained glass window shown below. Use 3.14 for π .



5. **STOVETOPS** What is the area of the stovetop shown, not including the burners? Use 3.14 for π .



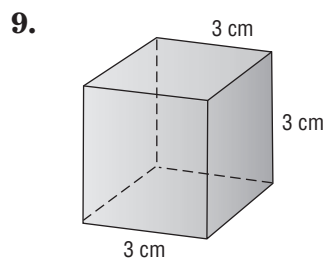
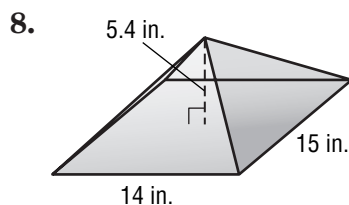
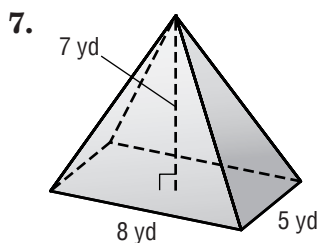
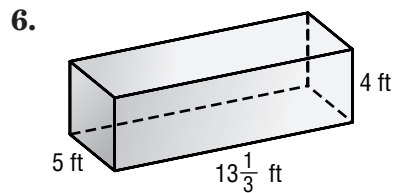
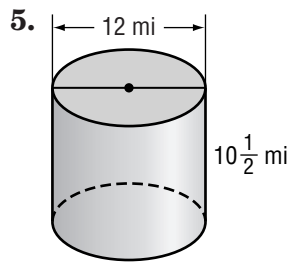
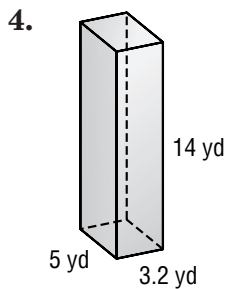
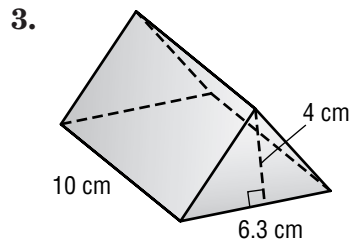
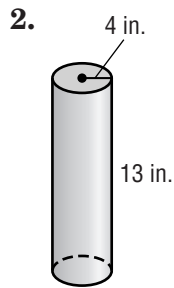
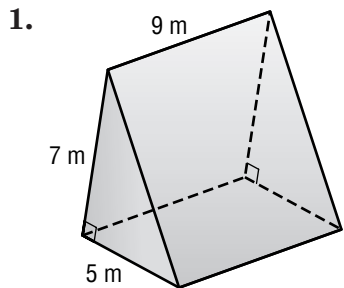
6. **GEOMETRY** How many squares of any size are in the figure?



8-7 Practice: Skills

Solid Figures and Volume

Find the volume of each solid. Use 3.14 for π . Round to the nearest tenth if necessary.



10. rectangular prism: length, 6 in.; width, 4 in.; height, 13 in.

11. cube: length, 5 ft; width, 5 ft; height, 5 ft

12. rectangular prism: length, 3.6 mm; width, 4 mm; height, 15.5 mm

13. square pyramid: square base, 25 in^2 ; height, 6 in.

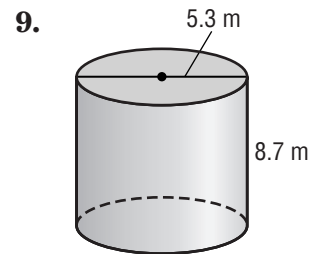
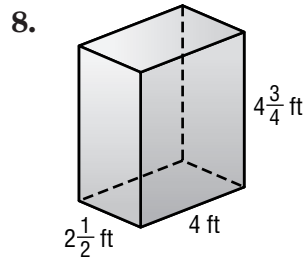
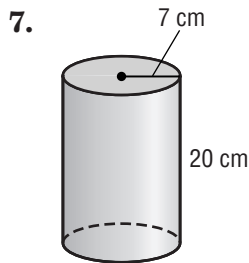
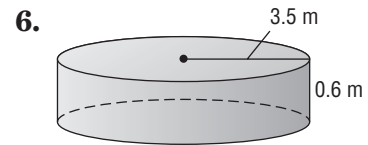
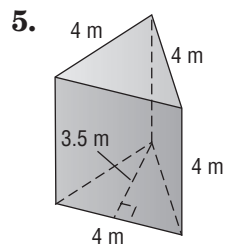
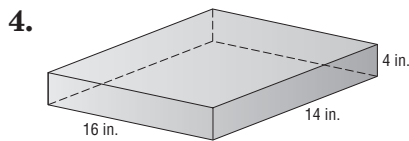
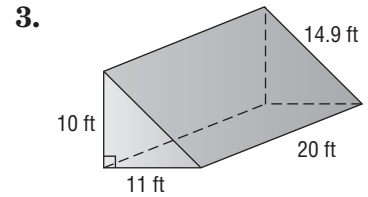
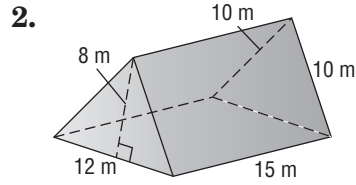
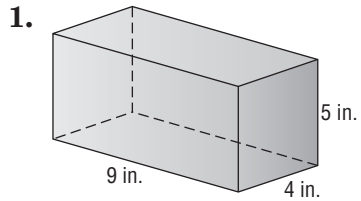
14. cylinder: diameter, 8 m; height, 16.2 m

8-8

Practice: Skills

Surface Area

Find surface area of each solid shown or described. Use 3.14 for π . If necessary, round to the nearest tenth.



10. rectangular prism: length 17 yd, width 4.5 yd, height 3 yd

11. cylinder: radius 16 ft, height 42 ft

12. cylinder: diameter 20.2 cm, height 43 cm