

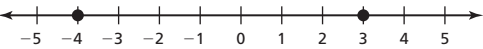
# Record and Practice Journal Answer Key

## Chapter 1

### Fair Game Review

- 9, -7, 0, 3, 8
- 4, -2, -1, 1, 2
- 11, -8, -6, 5, 9
- 7, -5, 0, 2, 4
- (0, 3)
- (3, 4)
- (4, 1)
- (5, 0)
- 27, -17, -12, 4, 30
- 14
- 3
- 394
- 86
- 76
- 16
- a. 386
- $4(2) + 2(5^2) + 3^2(6^2) + 2^2 = 386$

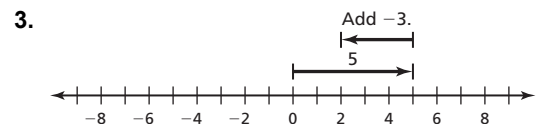
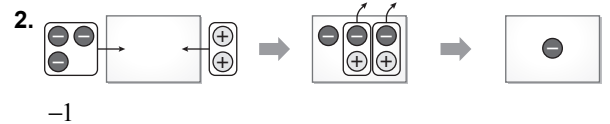
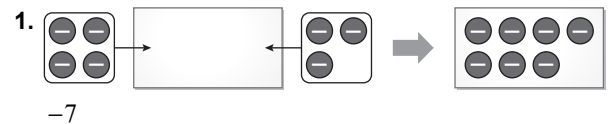
### 1.1 Activity

- a. 15 ft   b. 15 ft/sec  
c. negative   d. -15 ft/sec
- a. 4 ft   b. 4 ft/sec   c. positive   d. 4 ft/sec
- a. 120 ft   b. 120 ft/sec  
c. negative   d. -120 ft/sec
- |                               |     |    |    |   |    |     |
|-------------------------------|-----|----|----|---|----|-----|
| Velocity<br>(feet per second) | -14 | 20 | -2 | 0 | 25 | -15 |
| Speed<br>(feet per second)    | 14  | 20 | 2  | 0 | 25 | 15  |
- 16 ft/sec, 16 ft/sec
- 3;  3 is to the right of -4 on the number line.
- The object with the velocity of -4 feet per second has the greater speed because  $4 > 3$ .
- Speed is the absolute value of velocity.  
Speed tells how fast an object is moving. Velocity tells how fast it is moving and in what direction.
- a. true; Speed is always positive and the absolute value of a number is always positive.  
b. false; Velocity can be negative and the absolute value of a number is always positive.

### 1.1 Practice

- 1
- 14
- 0
- 6
- $>$
- $<$
- $>$
- $=$
- 4, -1,  $|-3|$ , 4,  $|7|$
- 3, -1,  $|2|$ ,  $|-5|$ , 6
- 9, -2, 0,  $|-7|$ ,  $|-8|$
- 12, -5
- a. -70, -2970   b. -70  
c. -2970; The outer core is the farthest from the surface.

### 1.2 Activity



- 2
- $7 + (-10) = -3$
  - Integers with the same sign; -7; negative
  - Integers with different signs, -1; negative
  - Integers with different signs; 2; positive
  - Integers with different signs; -3; negative
  - Integers with the same sign; 6; positive
  - Integers with the same sign; -8; negative
  - Integers with different signs; 4; positive
  - Integers with different signs; 6; positive
  - Integers with different signs; 0; zero
  - Integers with the same sign; -12; negative
  - Integers with different signs; 0; zero
  - Sample answer: It depends upon the specific numbers involved. The sum will have the same sign as the integer with the greater absolute value.

# Record and Practice Journal Answer Key

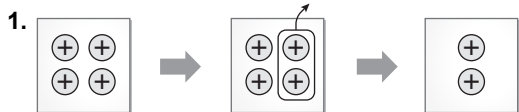
17. a. *Sample answer:* To add two positive integers, add normally. To add two negative integers, ignore the signs and add the two numbers, then make the answer negative.
- b. *Sample answer:* Subtract the lesser absolute value from the greater absolute value. Use the sign of the number with the greater absolute value.
- c. The sum is zero.

## 1.2 Practice

1. -7      2. 0      3. -18      4. 14  
 5. -22      6. -8      7. -3      8. 8  
 9. -5      10. -3      11. 27 points

12. a. 3 inches  
 b. December; Your hair was 2 inches longer in January and 3 inches longer in December.  
 c. August; That is when the total change in hair length is the greatest.

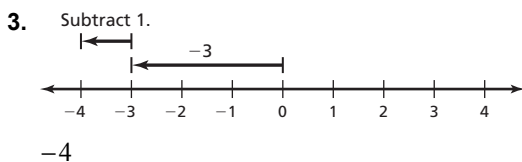
## 1.3 Activity



2



2



4.  $-3 + (-1) = -4$       5. Subtract 2; 2  
 6. Add -2; 2      7. Subtract 1; -4  
 8. Add -1; -4      9. Subtract 8; -5  
 10. Add -8; -5      11. Subtract 13; -4  
 12. Add -13; -4      13. Subtract -3; -3  
 14. Add 3; -3      15. Subtract -12; 7  
 16. Add 12; 7  
 17. Subtracting an integer is the same as adding its opposite.  
 18. To subtract an integer, add its opposite.

## 1.3 Practice

1. -5      2. 13      3. -19      4. -1  
 5. 27      6. -12      7. -15      8. 10  
 9. 2      10. -10      11. 4  
 12. 131 meters      13. -\$14      14. 11

## 1.4 Activity

1.  $3 \cdot 2 = 2 + 2 + 2 = 6$   
 2.  $3 \cdot (-2) = (-2) + (-2) + (-2) = -6$   
 3. The products decrease by 2 in each row. 4; 2; 0; -2; -4; -6  
 4. The products increase by 3 in each row. -9; -6; -3; 0; 3; 6  
 5. Integers with the same sign; 6; positive  
 6. Integers with different signs; -6; negative  
 7. Integers with different signs; -6; negative  
 8. Integers with the same sign; 6; positive  
 9. Integers with the same sign; 18; positive  
 10. Integers with different signs; -10; negative  
 11. Integers with different signs; -30; negative  
 12. Integers with same sign; 15; positive  
 13. *Sample answer:* 3 and 0

14. It can be positive, negative, or zero.  
 If one integer is negative and one integer is positive, then the product is negative.  
 If both integers have the same sign, then the product is positive.  
 If one or both integers are zero, then the product is zero.

15. a. Multiply the absolute values and make the product positive.  
 b. Multiply the absolute values and make the product negative.

## 1.4 Practice

1. 72      2. -49      3. -40      4. 30  
 5. 24      6. -210      7. 0      8. -96  
 9. 64      10. -121      11. 225      12. 48  
 13. -40      14. -144

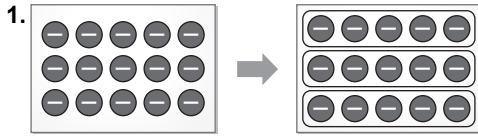
# Record and Practice Journal Answer Key

15. a.

Time	1 year	2 years	3 years	4 years
Value	\$1800	\$1600	\$1400	\$1200

b. The value of the computer decreases by \$200 each year.

## 1.5 Activity



-5

2. 4; 3

3.  $12 \div (-3) = -4$ ;  $12 \div (-4) = -3$ ; *Sample answer:*

When you divide a positive integer by a negative integer, you get a negative integer.

4.  $-12 \div (-4) = 3$ ;  $-12 \div 3 = -4$ ; *Sample answer:*

When you divide a negative integer by a negative integer, you get a positive integer. When you divide a negative integer by a positive integer, you get a negative integer.

5. Integers with different signs; -5; negative

6. Integers with the same sign; 3; positive

7. Integers with different signs; -4; negative

8. Integers with the same sign; 3; positive

9. Integers with different signs; -3; negative

10. Integers with the same sign; 3; positive

11. Integers with different signs; -5; negative

12. Integers with different signs; -2; negative

13. First integer is zero; 0; zero

14. First integer is zero; 0; zero

15. It could be positive, negative, or zero; positive if same sign, negative if different signs, zero if first integer zero.

16. a. Divide the absolute values and make the quotient positive.

b. Divide the absolute values and make the quotient negative.

## 1.5 Practice

1. -3      2. 4      3. -2      4. 3

5. -8      6. 1      7. 0      8. -5

9. 15

10. -9

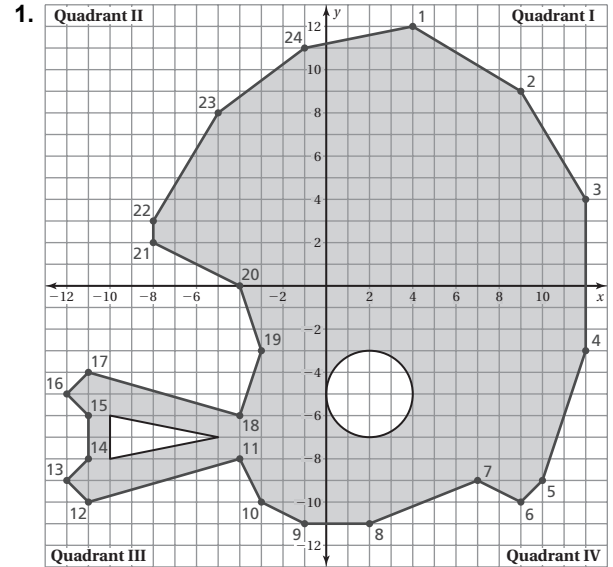
11. -59

12. -4 members

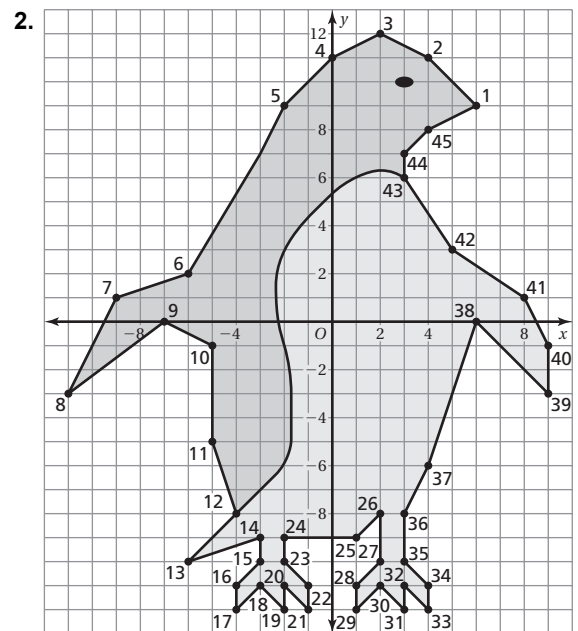
13. -3 yards

14. 11 times colder

## 1.6 Activity



The picture is a football helmet.



The picture is a penguin.

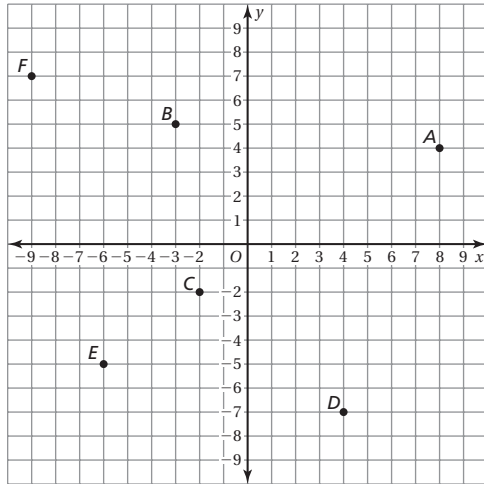
3. Use the first coordinate to move right or left from the origin. Then use the second coordinate to move up or down.

4. *Answer should include, but is not limited to:* Dot-to-dot picture in coordinate plane using at least 20 points, 2 points in each quadrant.

# Record and Practice Journal Answer Key

## 1.6 Practice

1–6.



1. Quadrant I
2. Quadrant II
3. Quadrant III
4. Quadrant IV
5. Quadrant III
6. Quadrant II
7.  $(-1, 3)$
8. a.  $(3, -1)$

b. Mall; The mall is 4 blocks from the center of town. Your house is 7 blocks from the center of town.

## Chapter 2

### Fair Game Review

1.  $\frac{13}{50}$
2.  $\frac{79}{100}$
3.  $\frac{571}{1000}$
4.  $\frac{423}{500}$
5. 0.375
6. 0.4
7. 0.6875
8. 0.85
9.  $\frac{3}{5}$
10.  $\frac{17}{72}$
11.  $\frac{47}{30}$
12.  $\frac{1}{3}$
13.  $\frac{2}{35}$
14.  $\frac{5}{27}$
15.  $\frac{2}{5}$
16.  $\frac{14}{11}$
17.  $\frac{3}{4}$
18.  $7\frac{1}{12}$  cups

### 2.1 Activity

1. a.  $-\frac{5}{3}, -0.5, -\frac{1}{3}, 0.5, 1.25$
- b.  $-\frac{7}{4}, -1.3, -\frac{1}{10}, \frac{1}{2}, 1.1$
- c.  $-1.7, -0.3, -\frac{1}{4}, \frac{3}{4}, 2.5$

d.  $-1.4, -\frac{3}{5}, \frac{1}{4}, 0.9, \frac{9}{2}$

e.  $-\frac{5}{4}, -1.1, -0.8, 0.75, \frac{9}{4}$

3. *Sample answer:* A number line can be used to organize rational numbers from least to greatest based on their order from left to right on the line.

Because  $-\frac{1}{2}$  is to the left of 0.4 when graphed on a number line,  $-\frac{1}{2} < 0.4$ .

4–7. Sample answers are given.

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

5.  $-2, -\frac{3}{2}, \frac{1}{2}$

6.  $-\frac{1}{5}, 0.1, \frac{5}{4}$

7.  $-2.1, 1.1, 2.5$

### 2.1 Practice

1.  $-0.9$

2.  $-4.\bar{6}$

3. 1.4375

4.  $-\frac{21}{25}$

5.  $5\frac{11}{50}$

6.  $-1\frac{179}{250}$

7.  $-\frac{1}{2}, -0.25, 0.1, \frac{1}{5}, 0.3$

8.  $-1.6, -\frac{6}{5}, -\frac{7}{8}, 0.9, \frac{5}{2}$

9.  $-\frac{10}{3}, -1.3, -\frac{2}{3}, 0.5, \frac{5}{9}$

10. Black garden ant

11. Runner D; Runner B

### 2.2 Activity

1. a.  $-0.7$  b.  $-\frac{3}{5}$  c.  $-1\frac{9}{10}$  d.  $-2.1$  e.  $-2.7$

2. a.  $1.5 + (-2.3) = -0.8$  b.  $-1\frac{1}{2} - \frac{1}{2} = -2$

3. a. 1/02/09: 65.43; 1/06/09: 940.93; 1/11/09: 900.93; 1/14/09: 822.50; 1/17/09: 811.95; 1/18/09: 764.74; 1/20/09: 889.74; 1/21/09: 891.86; 1/22/09: 831.87

b. *Sample answer:* Subtract 59.99 from the previous balance of 891.86.

c. *Sample answer:* Add  $-59.99$  to the previous balance of 891.86.

4. To add or subtract rational numbers, use the same rules for signs used for integers.

*Sample answer:*  $3.2 - 4.8 = 3.2 + (-4.8) = -1.6$

# Record and Practice Journal Answer Key

$$5. \frac{1}{2} + \frac{2}{3} + \left(-\frac{3}{4}\right) + \frac{1}{3} = \frac{3}{4}$$

$$6. 2.43 + (-1.09) + 3.47 + (-4.88) = -0.07$$

## 2.2 Practice

$$1. -\frac{13}{20} \quad 2. -8\frac{6}{7} \quad 3. -2\frac{11}{30} \quad 4. -\frac{7}{12}$$

$$5. -2\frac{1}{10} \quad 6. 10\frac{7}{12} \quad 7. -0.182 \quad 8. -5.57$$

$$9. 0.91 \quad 10. -14.5^\circ\text{F} \quad 11. 8\frac{7}{24} \text{ feet}$$

## 2.3 Activity

2. *Answer should include, but not limited to:* A written story that includes one negative number that is not an integer, one operation from addition, subtraction, multiplication, or division, a picture, and the solution of the problem.

3. *Sample answer:* Operations with rational numbers can be used in a story about money, distances, time, or weights. For example, an athlete in track practice beat his previous best time for 4 laps. The story could involve division to find the average change per lap. The change is represented by a negative number.

$$4. \left(-\frac{1}{8}\right) + \left(-\frac{1}{8}\right) = -\frac{1}{4} \quad 5. \left(-\frac{1}{8}\right) \times \left(-\frac{1}{8}\right) = \frac{1}{64}$$

$$6. 1.8 \times (-0.8) = -1.44 \quad 7. \left(-\frac{3}{8}\right) \div \left(\frac{3}{4}\right) = -\frac{1}{2}$$

$$8. -4.8 \div 2 = -2.4$$

## 2.3 Practice

$$1. \frac{16}{25} \quad 2. -2\frac{1}{4} \quad 3. -8\frac{4}{7} \quad 4. -1\frac{1}{5}$$

$$5. -\frac{7}{26} \quad 6. 1\frac{5}{22} \quad 7. 9.452 \quad 8. -45.\overline{45}$$

$$9. 7.9 \quad 10. -3\frac{9}{10} \text{ ft} \quad 11. -\$0.005$$

## 2.3b Practice

$$\begin{aligned} 1. & 4 + 5 + (-4) \\ & = 4 + (-4) + 5 && \text{Community Property} \\ & && \text{of Addition} \\ & = [4 + (-4)] + 5 && \text{Associative Property} \\ & && \text{of Addition} \\ & = 0 + 5 && \text{Additive Inverse Property} \\ & = 5 && \text{Addition Property of Zero} \end{aligned}$$

$$\begin{aligned} 2. & (5.3 + 2.5) + 4.7 \\ & = 5.3 + 4.7 + 2.5 && \text{Community Property} \\ & && \text{of Addition} \\ & = (5.3 + 4.7) + 2.5 && \text{Associative Property} \\ & && \text{of Addition} \\ & = 10 + 2.5 && \text{Add 5.3 and 4.7.} \\ & = 12.5 && \text{Add 10 and 2.5.} \end{aligned}$$

$$\begin{aligned} 3. & -2.1 + (2.1 - 4) \\ & = (-2.1 + 2.1) - 4 && \text{Associative Property} \\ & && \text{of Addition} \\ & = 0 - 4 && \text{Additive Inverse Property} \\ & = -4 && \text{Addition Property of Zero} \end{aligned}$$

$$\begin{aligned} 4. & 5 \cdot 8 \cdot \frac{1}{5} \\ & = 5 \cdot \frac{1}{5} \cdot 8 && \text{Community Property} \\ & && \text{of Multiplication} \\ & = \left(5 \cdot \frac{1}{5}\right) \cdot 8 && \text{Associative Property} \\ & && \text{of Multiplication} \\ & = 1 \cdot 8 && \text{Multiply 5 and } \frac{1}{5}. \\ & = 8 && \text{Multiplication Property of One} \end{aligned}$$


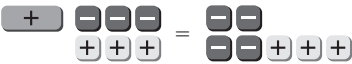

# Record and Practice Journal Answer Key

5.  $12\left(\frac{1}{6} \cdot 2\right)$   
 $= \left(12 \cdot \frac{1}{6}\right) \cdot 2$  Associative Property  
of Multiplication  
 $= 2 \cdot 2$  Multiply 12 and  $\frac{1}{6}$ .  
 $= 4$  Multiply 2 and 2.




6.  $\frac{1}{3}\left(3 \cdot \frac{3}{2}\right)$   
 $= \left(\frac{1}{3} \cdot 3\right) \cdot \frac{3}{2}$  Associative Property  
of Multiplication  
 $= 1 \cdot \frac{3}{2}$  Multiply  $\frac{1}{3}$  and 3.  
 $= \frac{3}{2}$  Multiplication Property of One

7. 0
8. *Sample answer:* Win a bid of 6. Win a bid of 4. Lose a bid of 10.

## 2.4 Activity

1.   
  


$x = -1$

2.   
  


$-7 = n$  or  $n = -7$



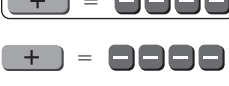

3. a.  $y = -15$  b.  $p = 4$   
c.  $t = -10$  d.  $z = -4$
4. a.  $-4 = x + 1; x = -5$  b.  $x - 3 = 3; x = 6$   
c.  $x - 5 = -4; x = 1$  d.  $5 = x - 2; x = 7$

5. a. True; A variable represents an unknown value and can be represented by any letter.  
b. True; To solve an equation is to find the value of the variable.  
c. False; The variable can be on the right side of the equation.  
d. True; Adding a number to both sides of an equation produces an equivalent equation.
6. Inverse operations can be used by subtracting in an equation that uses addition or adding in an equation that uses subtraction. *Sample answer:* The equation  $x + 3 = 5$  uses addition, so subtract 3 from each side to obtain  $x = 2$ . The equation  $x - 4 = 7$  uses subtraction, so add 4 to each side to obtain  $x = 11$ .
7. The value of  $x$  changes or varies, so  $x$  can equal both 2 and 3 in two different problems.
8. *Sample answer:* The weather varies from day to day. The amount of food a person eats in a day varies.

## 2.4 Practice

1. -38      2. -27      3. -37
4. -13.1      5.  $5\frac{21}{40}$       6. -8.72
7.  $x - 42 = -50; -8$       8.  $32 = z + 9; 23$
9. -\$1.8 million      10.  $-198\frac{3}{4}$  ft

## 2.5 Activity

1. a.   
  
  


$x = -4$

- b.  $k = -4$  c.  $t = -5$   
d.  $m = -4$  e.  $h = -4$
2. a.  $-8 = 4x, x = -2$  b.  $6x = -12, x = -2$   
c.  $-10 = 2x, x = -5$  d.  $3x = -18, x = -6$

# Record and Practice Journal Answer Key

4. *Sample answer:* Multiplication can be used to solve an equation involving division and division can be used to solve an equation involving multiplication. The equation  $x \div (-3) = -6$  involves division, so multiply each side by  $-3$  to obtain  $x = 18$ . The equation  $2x = -10$  involves multiplication, so divide each side by  $2$  to obtain  $x = -5$ .

## 2.5 Practice

- $-30$
- $-\frac{3}{4}$
- $30$
- $-0.25$
- $-50$
- $1.1$
- $\frac{x}{-8} = 7; -56$
- $-12x = 60; -5$
- 65 cups
- a.  $\frac{29}{30}b = 150.80$ ; A satellite radio costs \$156 at store B.  
b. You save \$5.20 by buying the satellite radio at store A.

## 2.5b Practice

- Terms:  $3x, 4, -7x, -6$ ;  
Like terms:  $3x$  and  $-7x, 4$  and  $-6$
- Terms:  $-9, 2.5y, -0.7y, 6.4y$ ;  
Like terms:  $2.5y, -0.7y,$  and  $6.4y$
- $3a + 9$
- $-\frac{1}{8}y + 7$
- $-3m + \frac{2}{3}$
- $-0.7w + 1.1$
- $7d - 5$
- $-p - 8$
- $2\ell + 12$
- $15x + 4$
- $16x + 12$
- $20w + 9m$
- $10.2x$

## 2.6 Activity

- |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|
| + | - | - | - | = | - | - | - |
| + | + | + | + | = | - | - | - |

+	-	-	-	=	-	-	-	-
+	+	+	+	=	-	+	+	+

+	=	-
+	=	-

+	=	-
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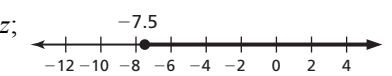
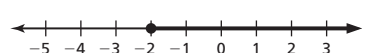

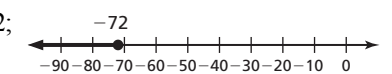
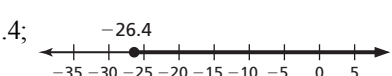
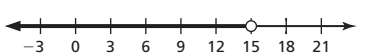
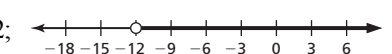
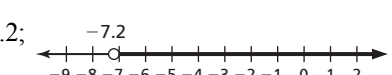
3; 2;  $x = -1$

- $x = -1$ ; adding 3 to each side.
- a.  $2x + 2 = -6; x = -4$   
b.  $-13 = 3x - 4; x = -3$
- a. 50 points, 25 points    b. \$38.92
- addition or subtraction; *Sample answer:*  
 $2x + 3 = -1$ , subtract 3 first;  $-4x + 1 = -10$ , subtract 1 first;  $\frac{1}{2}x - 4 = 6$ , add 4 first;  
 $-3x - 6 = 12$ , add 6 first
- $x = 25$ ; The steps are the same.

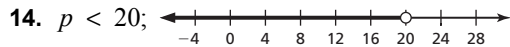
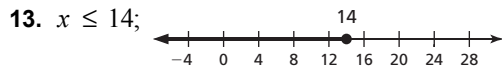
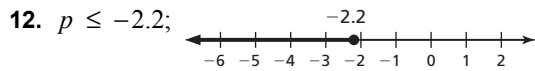
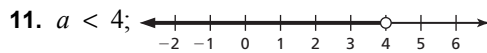
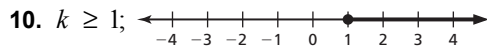
## 2.6 Practice

- $-3$
- $6$
- $-7$
- $3$
- $-6.9$
- $1\frac{2}{9}$
- Yes; Solving the equation  $34.95 + 15.75h = 100$  gives a solution of  $h \approx 4.13$  hours. So you can rent the jet ski for about 8.13 hours. Renting the jet ski for 8 hours costs \$97.95 and you have \$100.
- a.  $\ell = 2w - 3$     b. 7 meters

## 2.6b Practice

- $b < 12$ ; 
- $-7.5 \leq z$ ; 
- $c \geq -2$ ; 
- $8\frac{1}{4} > y$ ; 
- $x \leq -72$ ; 
- $t \geq -26.4$ ; 
- $n < 15$ ; 
- $f > -12$ ; 
- $m > -7.2$ ; 

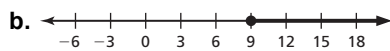
# Record and Practice Journal Answer Key



15. a.  $w + 16 \leq 20$ ;  $w \leq 4$

b. The solution  $w \leq 4$  means that your dog drank at most 4 quarts of water.

16. a.  $4x + 24 \geq 60$ ;  $x \geq 9$



no; yes; You have to answer 9 or more questions to win the game.

## Chapter 3

### Fair Game Review

1.  $\frac{1}{6}$       2.  $\frac{2}{3}$       3.  $\frac{1}{5}$       4.  $\frac{1}{2}$
5.  $\frac{4}{9}$       6.  $\frac{4}{5}$       7. no      8. yes
9. yes      10. no      11.  $\frac{6}{29}$
12. 4 yards      13. 7 gallons      14. 4 feet
15. 5 tons      16. 18 cups      17. 1280 ounces
18. 180 inches      19. 1.75 pounds      20. 48 cups

### 3.1 Activity

1. Numerical rates are sample answers.

Description	Verbal Rate	Numerical Rate (reasonable; unreasonable)
Your pay rate for washing cars	dollars per hour	$\frac{\$5}{h}$ , $\frac{\$50}{h}$
The average rainfall rate in a rain forest	inches per year	$\frac{100 \text{ in.}}{\text{yr}}$ , $\frac{5 \text{ in.}}{\text{yr}}$
Your average driving rate along an interstate	miles per hour	$\frac{60 \text{ mi}}{h}$ , $\frac{600 \text{ mi}}{h}$
The growth rate for the length of a baby alligator	inches per month	$\frac{0.5 \text{ in.}}{\text{mo}}$ , $\frac{10 \text{ in.}}{\text{mo}}$
Your running rate in a 100-meter dash	meters per second	$\frac{8 \text{ m}}{\text{sec}}$ , $\frac{80 \text{ m}}{\text{sec}}$
The population growth rate of a large city	people per year	$\frac{25,000 \text{ people}}{\text{yr}}$ , $\frac{10 \text{ people}}{\text{yr}}$
The average pay rate for a professional athlete	dollars per year	$\frac{\$3,000,000}{\text{yr}}$ , $\frac{\$3000}{\text{yr}}$
The fertilization rate for an apple orchard	pounds per acre	$\frac{150 \text{ lb}}{\text{acre}}$ , $\frac{1 \text{ lb}}{\text{acre}}$

2. a. \$72    b. \$4200    c. 220 mi  
d. \$27    e. 780 sec

3. Answer should include, but is not limited to: Students' rates should be either not simplified or in different units so work is done to compare the rates.

4. a. Sample answer: \$8 per hour  
b. Sample answer: \$3000 per month  
c. Sample answer: \$40,000 per year

5. Sample answer: Rates help describe how fast or slow something is happening. Sample answer: Examples are speed and growth rate.

6. a. Because working 40 hours a week is approximately 2000 hours a year.  
b. \$16,000 per year    c. \$12 million per year  
d. \$8 an hour is much less than \$1 million per month



# Record and Practice Journal Answer Key

## 3.1 Practice

1.  $\frac{4}{7}$
2.  $\frac{3}{1}$
3.  $\frac{7}{8}$
4. \$0.50 per ounce
5. 7.5 degrees per hour
6. 61 miles per hour
7. 30 pounds per box
8. \$1.89 per notebook
9. 12 pages per minute
10. Buy 3, get the fourth free
11. a. 3 centerpieces per hour    b. 14 hours

## 3.2 Activity

1. a.

Animal	Speed (miles per hour)	Speed (feet per second)
Antelope	61.0	89.5
Black Mamba Snake	20.0	29.3
Cheetah	70.0	102.6
Chicken	9.0	13.2
Coyote	43.0	63.1
Domestic Pig	10.9	16.0
Elephant	25.0	36.6
Elk	45.0	66.0
Giant Tortoise	0.2	0.3
Giraffe	32.0	46.9
Gray Fox	42.0	61.6
Greyhound	39.4	57.8
Grizzly Bear	30.0	44.0
Human	28.0	41.0
Hyena	40.0	58.7
Jackal	35.0	51.3
Lion	50.0	73.3
Peregrine Falcon	200.0	293.3
Quarter Horse	47.5	69.7
Spider	1.2	1.8
Squirrel	12.0	17.6
Thompson's Gazelle	50.0	73.3
Three-Toed Sloth	0.1	0.2
Tuna	47.0	68.9

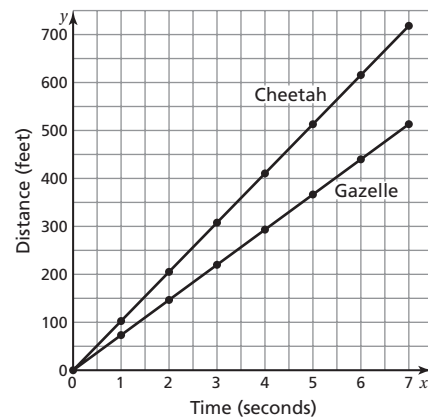
- b. fastest: Peregrine Falcon  
slowest: Three-Toed Sloth

- c. mi/h to ft/sec: Multiply by 5280 to convert miles to feet and divide by 3600 to convert hours to seconds.  
ft/sec to mi/h: Divide by 5280 to convert feet to miles and multiply by 3600 to convert seconds to hours.

2. a.

Time (seconds)	Cheetah Distance (feet)	Gazelle Distance (feet)
0	0	0
1	102.6	73.3
2	205.2	146.6
3	307.8	219.9
4	410.4	293.2
5	513	366.5
6	615.6	439.8
7	718.2	513.1

b.



- c. cheetah; cheetah

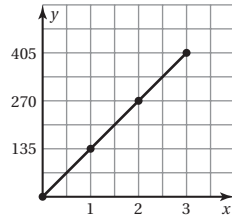
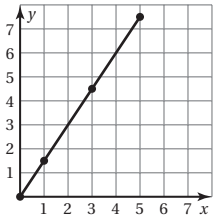
3. The steeper line has a higher rate. *Sample answer:* In the same amount of time, a cheetah will run farther than a gazelle and its line is steeper.
4. a-c. *Answer should include, but is not limited to:* A table comparing the distance (in feet) of 10 animals to the time (in seconds). A graph with 10 line graphs, each representing an animal. Students should conclude that the line with the steepest slope is the fastest animal and the line with the flattest slope is the slowest animal.

# Record and Practice Journal Answer Key

## 3.2 Practice

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

4. 1.5                      5. 135



6. a. Yes. The ramp has a slope of  $\frac{2}{25}$  which is 0.8.  
The maximum slope can be 0.83 so this slope is less than the maximum.  
b. *Sample answer:* The ramp could have a greater horizontal distance to decrease the slope.

## 3.3 Activity

1. a. equivalent  
b. not equivalent; Your rate is 45 miles per hour on the first day and 40 miles per hour on the second day. *Sample answer:* Change the second day to 225 miles in 5 hours.  
c. equivalent  
d. not equivalent; You pay \$0.45 per song on the first day and \$0.50 per song on the second day. *Sample answer:* Change the second day to 4 songs for \$1.80.
2. a. yes    b. 14;  $\frac{1 \text{ year}}{7 \text{ years}} = \frac{14 \text{ points}}{98 \text{ points}}$
3. a. It is not fair; You pay \$92 per ticket and I pay \$88.67 per ticket.  
b. It is fair; Each correct question is worth 5 points.  
c. It is not fair; You receive fewer baseball cards than football cards traded, and I receive more.
4. *Answer should include, but is not limited to:* Students choose a recipe and then show that after being doubled or tripled, the ingredients are proportional.
5. You can form 2 ratios and if they are equivalent, then things are “fair.” *Sample answer:* A store sells 2 shirts for \$25 or 3 shirts for \$37.50. This is “fair” because each shirt costs \$12.50.

## 3.3 Practice

1. no                      2. yes                      3. no                      4. yes  
5. yes                      6. yes                      7. no                      8. yes

9. yes                      10. no                      11. yes
12. 1.5 cups of fruit juice; *Sample answer:* You add 1.5 cups because  $8 \bullet 1.5 = 3 \bullet 4$ .

## 3.4 Activity

1. a.  $\frac{1}{2} = \frac{x}{58}$     b.  $\frac{1}{2} = \frac{x}{60}$     c.  $\frac{1}{2} = \frac{x}{64}$
2. 60 in. (61–90 lb), 62 in. (71–120 lb), 64 in. (121–170 lb), 66 in. (121+ lb)
3. a.  $\frac{200}{1000} = \frac{H}{50}$ ; 10 hits    b.  $\frac{250}{1000} = \frac{H}{84}$ ; 21 hits  
c.  $\frac{350}{1000} = \frac{H}{80}$ ; 28 hits    d.  $\frac{1000}{1000} = \frac{H}{1}$ ; 1 hit
4. *Sample answer:* Write the proportion so that the numerators have the same units and the denominators have the same units.
5. a. player 1  
b. *Sample answer:* no; Player 2 did not fail to get a hit in any of his 3 at bats.

## 3.4 Practice

1.  $\frac{x}{50} = \frac{84}{100}$                       2.  $\frac{x}{75} = \frac{96}{100}$
3.  $\frac{104}{4} = \frac{78}{g}$                       4.  $\frac{15}{4} = \frac{x}{3}$
5.  $x = 4$     6.  $y = 45$     7.  $z = 44$     8.  $b = 52$
9. a.  $\frac{c}{300} = \frac{7}{15}$     b. 140
10.  $\frac{30}{1822.5} = \frac{120}{c}$ ; \$7290.00

## 3.5 Activity

1. a. 750    b. 1 cup of white glue  
c. 2 cups of water  
d.  $y = \frac{1}{2}$  cup white glue solution  
 $x = 1$  cup white glue solution
3. Ratio table can be used to set up a proportion and the proportion can be solved using cross products. *Sample answer:* You can find the amount of certain ingredients in a recipe or the amount of chemicals in a solution.

# Record and Practice Journal Answer Key

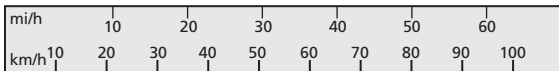
4. *Sample answer:*  $\frac{1}{5} = \frac{2}{10}, \frac{4}{16} = \frac{3}{12}, \frac{8}{20} = \frac{6}{15}$

## 3.5 Practice

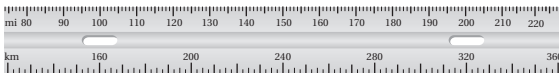
1.  $a = 12$    2.  $c = 42$    3.  $b = 35$    4.  $k = 3$   
 5.  $h = 35$    6.  $n = 6$    7.  $x = 5$    8.  $y = 3.5$   
 9.  $z = 6$    10. \$6   11. 48

## 3.6 Activity

1. **a.** Inch: The width of a human thumb.  
 Foot: The length of a human foot.  
 Yard: The distance from a human nose to the end of an outstretched human arm.  
 Mile: The distance a human can walk in 1000 paces (two steps).  
**b.** *Sample answer:* They are not exact, but they are close.
2. **a.** 60 mi/h; From the diagram,  
 60 mi/h  $\approx$  96 km/h.  
 So, 80 km/h < 60 mi/h.



- b.** 200 mi; From the diagram, 200 mi  $\approx$  320 km.  
 So, 200 km < 200 mi.



- c.** 180 cm; From the diagram, 68 in.  $\approx$  172.7 cm.  
 So, 180 cm > 5 ft 8 in.



- d.** 8 mm; From the diagram,  $\frac{5}{16}$  in.  $\approx$  7.9 mm.  
 So,  $\frac{5}{16}$  in. < 8 mm.



- e.** 1.4 m; From the diagram, 4 ft  $\approx$  1.2 m.  
 So, 1.4 m > 4 ft.



- f.** 7000 ft; From the diagram, 7000 ft  $\approx$  2100 m.  
 So, 2000 m < 7000 ft.



- g.** 12 ft; From the diagram, 12 ft  $\approx$  3.66 m.  
 So, 3.5 m < 12 ft.



3. Convert one length into the units of the other length and then compare. *Sample answer:* To determine if 2 feet is larger than 120 centimeters, convert 2 feet to centimeters by multiplying by 12 inches per foot and by 2.54 centimeters per inch. Because 2 ft = 121.92 cm, 2 ft > 120 cm.

4. **a.** 40,000,000 m   **b.** 40,000 km  
 5. about 25,000 miles

## 3.6 Practice

1. 16 km   2. 33.33 lb   3. 5.7 L   4. >  
 5. <   6. >   7. >   8. 96  
 9. 182.88   10. 197.6   11. 177.78  
 12. about 8 laps   13. about 0.007 ounce  
 14. about 64.4 pounds to about 71.1 pounds

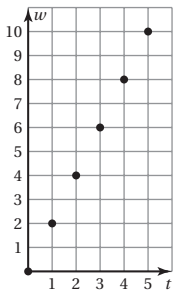
## 3.7 Activity

1.

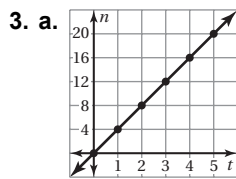
Thumb, $t$	Wrist, $w$	Neck, $n$	Waist, $x$
0 in.	0 in.	0 in.	0 in.
1 in.	2 in.	4 in.	8 in.
2 in.	4 in.	8 in.	16 in.
3 in.	6 in.	12 in.	24 in.
4 in.	8 in.	16 in.	32 in.
5 in.	10 in.	20 in.	40 in.

# Record and Practice Journal Answer Key

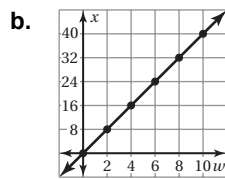
2. (0, 0), (1, 2), (2, 4), (3, 6), (4, 8), (5, 10);



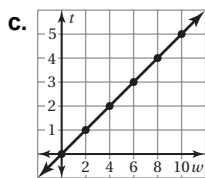
- All the points lie on a line.
- The line passes through the origin.



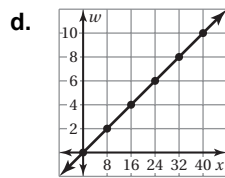
$$n = 4t$$



$$x = 4w$$



$$t = \frac{1}{2}w$$



$$w = \frac{1}{4}x$$

- A graph can be used to show that two variables vary directly when all the points lie on a line and the line passes through the origin. An equation can be used when one variable is a factor of the other variable.
- Sample answer:* The distance and time of a car traveling at a constant rate.
- Answer should include, but is not limited to:* Measurements and an explanation on whether the tailor was accurate.

## 3.7 Practice

- Yes. The line is in the form  $y = kx$ .
- No. The line does not go through the origin.
- No. The line does not go through the origin.
- No. The line does not go through the origin.
- Yes. The line is in the form  $y = kx$ .
- Yes. The line is in the form  $y = kx$ .

7.  $y = 4x$       8.  $y = \frac{7}{8}x$       9.  $y = \frac{5}{7}x$

10. No,  $p$  and  $c$  do not show direct variation.

11.  $y = \frac{1}{4}x$

12. Yes,  $m = 60.5h$ .

## 3.7b Practice

- (0, 0): The car travels 0 miles in 0 hours.  
(1, 60): The car travels 60 miles in 1 hour.  
(2, 120): The car travels 120 miles in 2 hours.
- (0, 0): 0 pounds of shrimp costs \$0.  
(4, 40): 4 pounds of shrimp costs \$40.  
(7, 70): 7 pounds of shrimp costs \$70.
- (0, 0): You receive 0 emails in 0 days.  
(3, 45): You receive 45 emails in 3 days.  
(4, 60): You receive 60 emails in 4 days.
- (0, 0): There are 0 cups of blueberries in 0 pies.  
(2, 12): There are 12 cups of blueberries in 2 pies.  
(4, 24): There are 24 cups of blueberries in 4 pies.
- a. Waiter A: 20%; Waiter B: 15%  
b. Waiter A: 1000 cents, or \$10;  
Waiter B: 750 cents, or \$7.50
- a. Salesman A: 5%; Salesman B: 7.5%  
b. \$250  
c. \$125 less

## 3.8 Activity

1. a. 1 by 36; 2 by 18; 3 by 12; 9 by 4; 12 by 3;  
18 by 2; 36 by 1

b.

Height, $h$	Base, $b$	Area, $A$
1	36	36
2	18	36
3	12	36
4	9	36
6	6	36
9	4	36
12	3	36
18	2	36
36	1	36

- c. decreases; increases

# Record and Practice Journal Answer Key

2. a.  $c = \frac{200}{n}$ ; inverse variation  
 b.  $p = 20r$ ; direct variation  
 c.  $s = \frac{240}{t}$ ; inverse variation
3. If when one variable increases, the other variable decreases at a proportional rate then the two variables are inversely proportional. As the values in one column of a table increase, the values in the other column decrease.
4. Wing length and wing beat frequency are inversely proportional because the smaller the wings, the faster the bird can beat its wings.
5. *Sample answer:* The size and quickness of an animal are inversely proportional, in general.

### 3.8 Practice

1. neither                                      2. inverse variation  
 3. direct variation                          4. inverse variation
5.  $y = \frac{5}{x}$                                       6.  $y = \frac{7}{x}$
7. a. yes;  $s = \frac{24}{p}$

People, $p$	Serving size, $s$
2	12
4	6
6	4

b. 4.8 ounces

## Chapter 4

### Fair Game Review

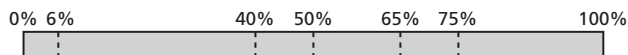
1. 18%      2. 10%      3. 58%      4. 93%
5. 0.625      6. 0.525      7.  $\frac{13}{50}$       8.  $\frac{79}{100}$
9.  $\frac{13}{20}$       10. 65%      11. 94%      12.  $\frac{13}{25}$
13.  $\frac{31}{100}$       14. 6%      15. 84%      16. 0.22
17. 1.91

18–20.

Percent	Decimal	Fraction
45%	0.45	$\frac{9}{20}$
73%	0.73	$\frac{73}{100}$
30%	0.3	$\frac{3}{10}$

### 4.1 Activity

1.



2. 3; 25%; 12  
 a. 15    b. 22.5    c. 12    d. about 1.5    e. about 20
3. a. 20%    b. 25%    c. about 50%  
 d. 62.5%    e. 150%
4. a. 72    b. 52    c. 550    d. 100    e. 180

5. *Sample answer:* You can place a number on a model and estimate what portion of the model is occupied by that length.

### 4.1 Practice

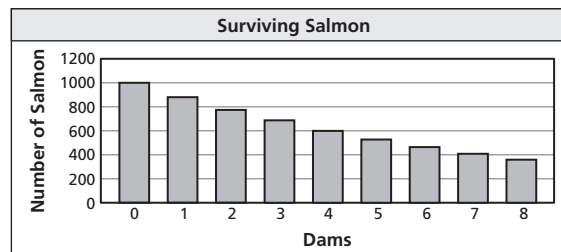
1.  $a = 0.4 \cdot 60$ ; 24                      2.  $17 = p \cdot 50$ ; 34%
3.  $57 = 0.38 \cdot w$ ; 150                  4.  $a = 0.44 \cdot 25$ ; 11
5.  $52 = p \cdot 50$ ; 104%                  6.  $18 = 1.5 \cdot w$ ; 12
7. \$141
8. a. 6 gallons    b. 10 gallons    c. 4.8 gallons

### 4.2 Activity

1.

Dam	0	1	2	3	4
Salmon	1000	880	774	681	599

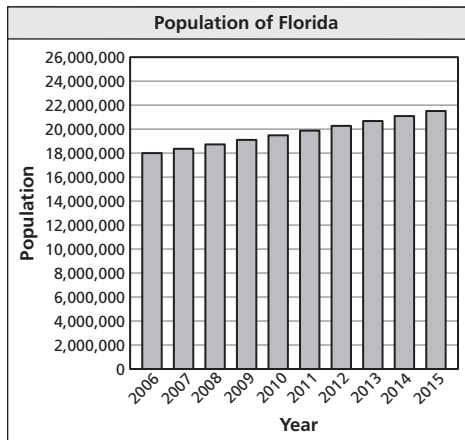
Dam	5	6	7	8
Salmon	527	464	408	359



# Record and Practice Journal Answer Key

2.

Year	Population
2006	18,000,000
2007	18,360,000
2008	18,727,200
2009	19,101,744
2010	19,483,779
2011	19,873,455
2012	20,270,924
2013	20,676,342
2014	21,089,869
2015	21,511,666



3. 12%

4. *Sample answer:* the depreciation of a car; the selling price of a car after the dealership increases it

5. When the original amount decreases, the percent of change is called a *percent of decrease*. When the original amount increases, the percent of change is called a *percent of increase*.

## 4.2 Practice

- |                    |                     |
|--------------------|---------------------|
| 1. increase; 100%  | 2. decrease; 40%    |
| 3. decrease; 12.5% | 4. increase; 42.9%  |
| 5. 186 books       | 6. 28 members       |
| 7. 50% decrease    | 8. 2827.7% increase |

## 4.3 Activity

1. Store C is the best buy as long as you get the full 70% off.

2. *Sample answer:* Use the model to write and solve a proportion.

$$\frac{\$22.40}{\text{original price}} = \frac{70\%}{100\%}$$

3. a. \$562.50   b. \$112.50   c. \$45

4. *Sample answer:* To find discounts, use the percent of the discount to set up and divide a model into sections. For example, to find a discount of 35% on \$50, divide a model into sections of 5%. That way, you can find the amount of the discount and the price.

To find markups, use the percent to set up and divide a model into sections. For example, to find a markup of 150% on \$30, shade 2 sections on a model to represent 100%, or \$30. Then, add 3 sections to represent the markup of 150%. Use the model to find the price.

## 4.3 Practice

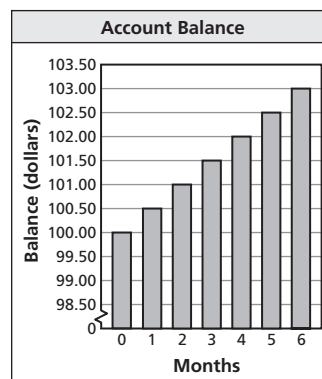
- |               |            |          |          |
|---------------|------------|----------|----------|
| 1. \$16       | 2. \$61.75 | 3. \$222 | 4. \$130 |
| 5. \$23       | 6. \$56    | 7. 140%  | 8. 250%  |
| 9. a. \$18.20 | b. 16.5%   |          |          |

## 4.4 Activity

1. a. \$3; \$103

b.

Amount	Interest	Balance
0 month	\$0	\$100
1 month	\$0.50	\$100.50
2 months	\$1	\$101
3 months	\$1.50	\$101.50
4 months	\$2	\$102
5 months	\$2.50	\$102.50
6 months	\$3	\$103



# Record and Practice Journal Answer Key

2. *Sample answer:* A credit card allows you to purchase items and then pay later. But, each month the credit card company charges interest on the unpaid balance. For example, a typical family owes \$5000 on their credit card and the interest rate is 18% per year. After one month, the interest owed is  $5000(0.18)\left(\frac{1}{12}\right) = \$75$ . So, the balance is \$5075.

3. a. \$10,000,000,000,000; 13 zeros    b. \$300 billion  
c. \$821,917,808.22    d. \$1000

4. You can use the equation  $I = Prt$  to find either simple interest earned on an account or interest owed on a loan. *Sample answer:* The simple interest earned on \$2500 at 4% simple interest per year for 3 years is

$$I = Prt = 2500(0.04)(3) = \$300.$$

The interest owed on \$3000 at 7% interest over 3 years is

$$I = Prt = 3000(0.07)(3) = \$630.$$

## 4.4 Practice

- a. \$84    b. \$484
- a. \$268.80    b. \$1468.80
- 6%                      4. 6.2%                      5. 2 years
- 6 years                    7. 6.3%                      8. \$114.75

## Chapter 5

### Fair Game Review

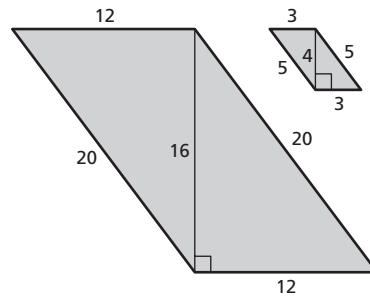
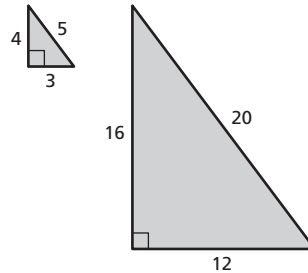
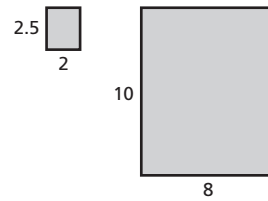
- 58 ft                                      2. 40 in.
- about 69.08 cm                      4. 74 in.
- about 30.84 mm                      6. 57 in.
- 40 m                      8.  $x = 16$                       9.  $x = 8$
- $x = 11.25$                       11.  $x = 3$                       12.  $x = 6$
- $x = 12$                                       14.  $x = \$37.50$

### 5.1 Activity

- a. no; the ratios are not proportional  
b. yes; the ratios are proportional  
c. yes; the ratios are proportional

2. a. The original design is proportional to Design 2. Design 1 is a slightly distorted picture of the original design.

b. *Sample answer:*



3. *Sample answer:* It can help by knowing what size pictures and designs will work in certain places. Magazines use proportions to have photos fit on a page with text. Architects use proportions to design blueprints.

4. a–b. Check students' work.

c. *Sample answer:*  $\ell_1 = 0.75$  cm,  $w_1 = 0.5$  cm  
 $\ell_2 = 1.5$  cm,  $w_2 = 1$  cm

d. *Sample answer:*  $\frac{\text{Length of Larger}}{\text{Length of Smaller}} = 2$ ;

$\frac{\text{Width of Larger}}{\text{Width of Smaller}} = 2$ ; They are proportional.

### 5.1 Practice

- side:  $AB$  and  $EF$                        $\angle A$  and  $\angle E$   
side:  $BC$  and  $FG$                        $\angle B$  and  $\angle F$   
side:  $CD$  and  $GH$                        $\angle C$  and  $\angle G$   
side:  $DA$  and  $HE$                        $\angle D$  and  $\angle H$

# Record and Practice Journal Answer Key

2. side:  $XY$  and  $LM$        $\angle X$  and  $\angle L$   
 side:  $YZ$  and  $MN$        $\angle Y$  and  $\angle M$   
 side:  $ZX$  and  $NL$        $\angle Z$  and  $\angle N$

3. Yes; corresponding sides are proportional.  
 4. No; corresponding sides are not proportional.  
 5. no  
 6. a. no    b. yes

## 5.2 Activity

1. a.  $P = 8, A = 4; P = 12, A = 9;$   
 $P = 16, A = 16$   
 b.  $P = 6, A = 4B; P = 9, A = 9B;$   
 $P = 12, A = 16B$   
 c.  $P = 12, A = 8; P = 18, A = 18;$   
 $P = 24, A = 32$   
 d.  $P = 8, A = 4C; P = 12, A = 9C;$   
 $P = 16, A = 16C$

2.









	Figure	Original Side Lengths	Double Side Lengths
Perimeters		$P = 4$	$P = 8$
		$P = 3$	$P = 6$
		$P = 6$	$P = 12$
		$P = 4$	$P = 8$

	Figure	Triple Side Lengths	Quadruple Side Lengths
Perimeters		$P = 12$	$P = 16$
		$P = 9$	$P = 12$
		$P = 18$	$P = 24$
		$P = 12$	$P = 16$

When the side lengths are multiplied by a number, the perimeter is multiplied by the same number.

3.









	Figure	Original Side Lengths	Double Side Lengths
Areas		$A = 1$	$A = 4$
		$A = B$	$A = 4B$
		$A = 2$	$A = 8$
		$A = C$	$A = 4C$

	Figure	Triple Side Lengths	Quadruple Side Lengths
Areas		$A = 9$	$A = 16$
		$A = 9B$	$A = 16B$
		$A = 18$	$A = 32$
		$A = 9C$	$A = 16C$

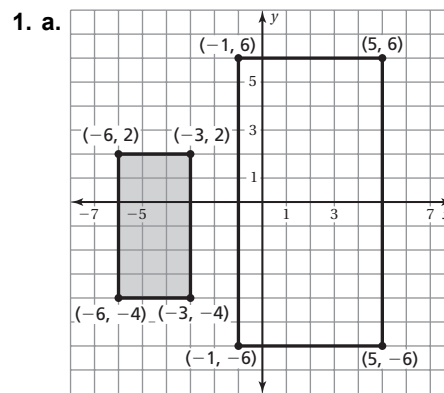
When the side lengths are multiplied by a number, the area is multiplied by the square of the number.

4. When the dimensions are all multiplied by the same number, the perimeter is multiplied by the number, and the area is multiplied by the square of the number.

## 5.2 Practice

1.  $8 : 3; 64 : 9$     2.  $3 : 5; 9 : 25$     3.  $3 : 4; 9 : 16$   
 4.  $11 : 4; 121 : 16$     5.  $16 : 25$     6.  $9 : 4$

## 5.3 Activity

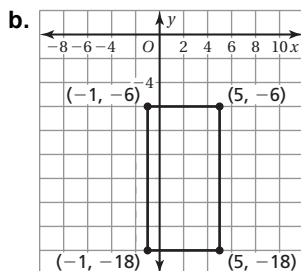


$$\frac{6}{12} = \frac{3}{6}$$

Yes, the rectangles are similar.



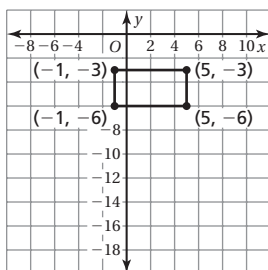
# Record and Practice Journal Answer Key



$$\frac{\text{Shaded Length}}{\text{Unshaded Length}} = \frac{\text{Shaded Width}}{\text{Unshaded Width}}$$

$$\frac{6}{12} = \frac{?}{6}$$

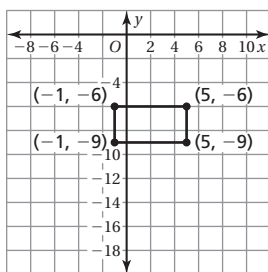
$$\frac{1}{2} = \frac{1}{2}$$



$$\frac{\text{Shaded Length}}{\text{Unshaded Length}} = \frac{\text{Shaded Width}}{\text{Unshaded Width}}$$

$$\frac{6}{6} = \frac{?}{3}$$

$$1 = 1$$



$$\frac{\text{Shaded Length}}{\text{Unshaded Length}} = \frac{\text{Shaded Width}}{\text{Unshaded Width}}$$

$$\frac{6}{6} = \frac{?}{3}$$

$$1 = 1$$

2. a. 2 mi; Solve the proportion  $\frac{0.75 \text{ in.}}{1 \text{ mi}} = \frac{1.5 \text{ in.}}{x \text{ mi}}$

b. 2 mi; The proportion is the same as the one from part (a).

3. You need to know the lengths of a pair of corresponding sides and the length of the side that corresponds to the unknown length.

*Sample answer:* A rectangle has a length of 5 inches and a width of 3 inches. A similar rectangle has a width of 6 inches. You can solve the proportion  $\frac{5 \text{ in.}}{x \text{ in.}} = \frac{3 \text{ in.}}{6 \text{ in.}}$  to find the length of the similar rectangle.

The lengths of two similar rectangles are 8 feet and 4 inches, respectively, and the width of the first rectangle is 1 foot. You can solve the proportion  $\frac{8 \text{ ft}}{4 \text{ in.}} = \frac{1 \text{ ft}}{x \text{ in.}}$  to find the length of the second rectangle.

4. yes; Because the ratio of the lengths is equal to the ratio of the widths and the ratio of the lengths is known, you can solve a proportion to find the missing width.

## 5.3 Practice

- |         |          |           |
|---------|----------|-----------|
| 1. 3.75 | 2. 16.8  | 3. 2.625  |
| 4. 6    | 5. 20 ft | 6. 65 in. |

## 5.4 Activity

- Answer should include, but is not limited to:* Make sure students find all parts of the wall that will not be painted. Check that the scale is reasonable and is used correctly to make the scale drawing.
- Answer should include, but is not limited to:* Make sure students round up when finding the amount of paint needed. More than one roller, pan, and brush set can be included in the total cost.
  - Sample answer:* Total Area: 150 ft<sup>2</sup>
  - Sample answer:* 2 gallons of paint are needed
  - Sample answer:* \$92
- A scale drawing can make it easy to calculate the area of the parts to be painted, by finding the difference of the total area and the area of the parts that will not be painted. Then, you can use the area to be painted to find the amount of paint you need and the cost of painting the room.
- Answer should include, but is not limited to:* Follow the steps used in Activities 1 and 2.
- Sample answer:* 1 cm : 1 mi; 1 cm : 150 mi; 2 cm : 30 mi

# Record and Practice Journal Answer Key

6. When you zoom out, the measured distance stays the same and the actual distance increases. So, the scale decreases. When you zoom in, the measured distance stays the same and the actual distance decreases. So, the scale increases.

## 5.4 Practice

1. 112 ft      2. 2500 cm      3. 9.6 in.

4.  $24\frac{1}{3}$       5. 14.4 in.

6. a. 12 mi    b. 4.25 in.

## 5.4b Practice

1. 150,000 yd<sup>2</sup>      2. 12 ft<sup>2</sup>

3. Check students' drawings.

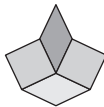
4. Check students' drawings.

## 5.5 Activity

1. b. yes; *Sample answer:*



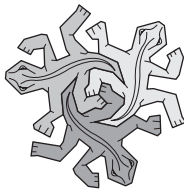
- c. yes; *Sample answer:*



- d. yes; *Sample answer:*

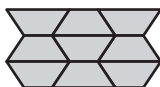
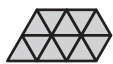
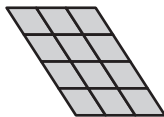
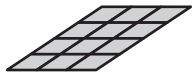
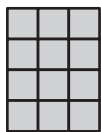


- e. yes; *Sample answer:*



2. a. All of them


b.



- c. The tessellations for the square, parallelograms, and hexagon can be made using only translations. You have to rotate or flip the triangle and trapezoid to make a tessellation.

3. *Answer should include, but is not limited to:* Make sure the pattern can be formed back into one of the basic shapes and that there are no gaps in the tessellation.

4. A tessellation can be created by translating a tile or design many times so that there are no empty spaces between the tiles.

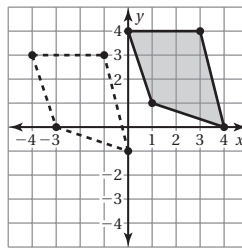
5. *Sample answer:* 

Yes, because the parallel sides allow the shapes to fit together nicely.

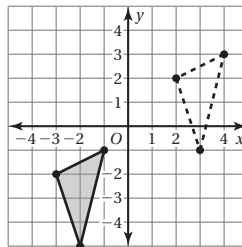
## 5.5 Practice

1. no      2. yes      3. no

4.  $(-4, 3)$ ,  $(-1, 3)$ ,  $(-3, 0)$ , and  $(0, -1)$



5.  $(2, 2)$ ,  $(4, 3)$ , and  $(3, -1)$



6. 3 units right and 3 units down

7. 3 units left and 5 units down

## 5.6 Activity

2. a. neither    b. neither    c. horizontally

- d. horizontally    e. neither    f. neither

3. *Sample answer:* 

4. *Sample answer:* 

5. *Sample answer:* 

# Record and Practice Journal Answer Key

6. When you fold a frieze pattern horizontally or vertically and the pattern coincides, then the frieze pattern is a reflection of itself horizontally or vertically.

## 5.6 Practice

- no
- yes
- yes
- $A'(1, -2), B'(3, -3), C'(0, -4)$
- $W'(4, -2), X'(3, -4), Y'(1, -3), Z'(3, -1)$
- $J'(-3, 4), K'(-4, 0), L'(-2, 3)$
- $M'(-2, 2), N'(-2, 3), P'(-3, 3), Q'(-4, 1)$

8. no

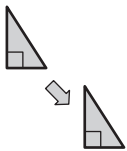
## 5.7 Activity

- reflect the shaded triangle in the  $y$ -axis; translate the shaded triangle 4 units to the right; rotate the shaded triangle  $90^\circ$  counterclockwise; *Answer should include, but is not limited to:* Four triangles that are a translation, reflection, or rotation of the shaded triangle. The student should also describe each transformation.
- The triangle is rotated and translated. The quadrilateral is rotated and translated.
  - yes; *Answer should include, but is not limited to:* A tessellation created using a triangle. Explanation that the triangle will tessellate because two of the triangles can form a parallelogram.
  - yes; *Answer should include, but is not limited to:* A tessellation created using a quadrilateral.

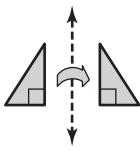
3. translation, reflection, rotation;

*Sample answer:*

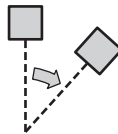
Translation



Reflection



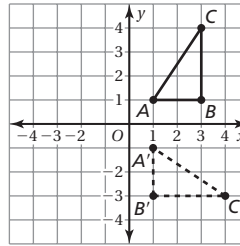
Rotation



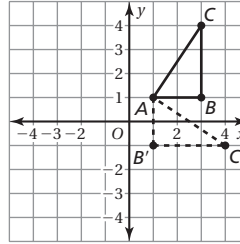
## 5.7 Practice

- no
- yes;  $180^\circ$  clockwise or counterclockwise

3.  $A'(1, -1), B'(1, -3), C'(4, -3)$



4.  $A'(1, 1), B'(1, -1), C'(4, -1)$



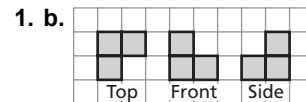
5.  $(4, -4), (2, -4), (3, -1)$

## Chapter 6

### Fair Game Review

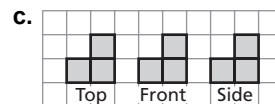
- $51 \text{ m}^2$
- about  $146.93 \text{ m}^2$
- $74 \text{ in.}^2$
- $171 \text{ in.}^2$
- $81 \text{ ft}^2$
- $88 \text{ in.}^2$
- \$444
- about  $314 \text{ in.}^2$
- about  $113.04 \text{ m}^2$
- about  $452.16 \text{ cm}^2$
- about  $153.86 \text{ ft}^2$
- about  $490.625 \text{ yd}^2$
- about  $706.5 \text{ mm}^2$
- about  $502.4 \text{ cm}^2$

### 6.1 Activity



Surface area: 18 square units

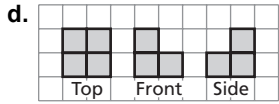
Volume: 4 cubic units



Surface area: 18 square units

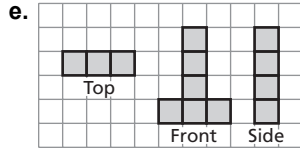
Volume: 4 cubic units

# Record and Practice Journal Answer Key



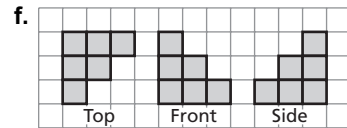
Surface area: 20 square units

Volume: 5 cubic units



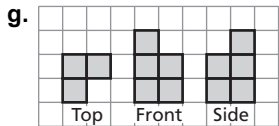
Surface area: 26 square units

Volume: 6 cubic units



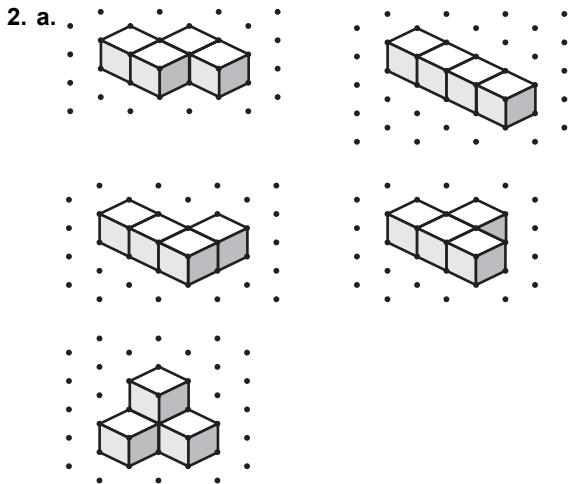
Surface area: 36 square units

Volume: 10 cubic units



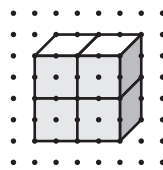
Surface area: 26 square units

Volume: 7 cubic units



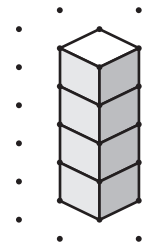
b. No; The surface area of the first solid in part (a) is 16 square units. The surface area of the other 7 solids is 18 square units. These solids all have 3 pairs of joined sides, whereas the first solid in part (a) has 4 pairs of joined sides. Yes; Because each solid is made by joining 4 cubes, the volume is 4 cubic units.

3. *Sample answer:* You can use dot paper to draw three-dimensional figures formed by cubes by shading parallel sides the same color to create a three-dimensional illusion.



Volume: 4 cubic units

Surface area: 16 square units



Volume: 4 cubic units

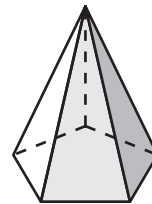
Surface area: 18 square units

4. a. The people walking clockwise appear to only go upward, but they keep returning to the same level. The people walking in the opposite direction appear to only go downward.

b. The cartoon is funny because it appears that the man will continue to tumble down the stairs forever. The illusion is that the steps are drawn so that they never end.

## 6.1 Practice

1. *Sample answer:*



3. Front View



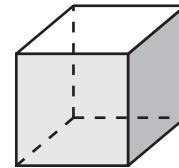
Top View



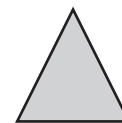
Side View



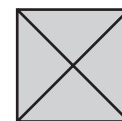
2. *Sample answer:*



4. Front View



Top View

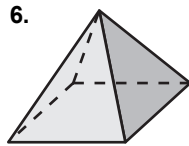
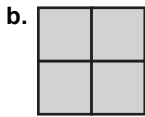


Side View



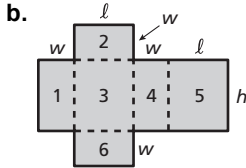
# Record and Practice Journal Answer Key

5. a. 8



## 6.2 Activity

1. a. 126 square units



$$SA = wh + lw + lh + wh + lh + lw$$

$$= 2(wh) + 2(lh) + 2(lw)$$

2. 48 square units; triangular prism

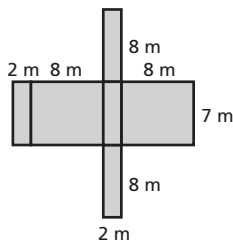
3. You can use the net for a prism to find the surface area of the prism by finding the sum of the areas of the faces shown in the net.

*Answer should include, but is not limited to:* A prism made by drawing a net, cutting it out, and folding it.

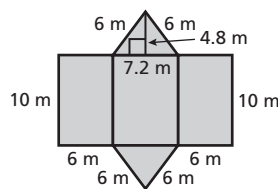
4. The three smaller blocks; Each has a surface area of  $6 \text{ ft}^2$ . So their total surface area is  $18 \text{ ft}^2$ . The bigger block has a surface area of  $14 \text{ ft}^2$ . Because the smaller blocks have a greater total surface area, they will melt faster.

## 6.2 Practice

1.  $172 \text{ m}^2$



2.  $226.56 \text{ m}^2$



3.  $336 \text{ cm}^2$

4.  $294 \text{ in.}^2$

5. Yes. The cake needs 205 square inches of frosting. You do not frost the bottom so you subtract the bottom surface area.

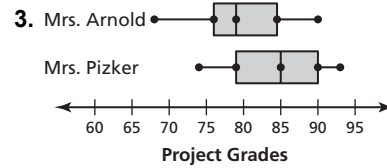
6.  $385 \text{ cm}^2$

## 6.2b Practice

1. a. Survey 1: 420 students; Survey 2: 680 students

b. The prediction from Survey 1 is more reasonable because it uses a reasonable sample.

2. In general, boys have a larger shoe size than girls.



In general, Mrs. Pizker's class received higher grades on the project.

## 6.3 Activity

1. *Answer should include, but is not limited to:*

- A discussion of how to find the area of the outside of the roll.
- The results are shown for measuring to estimate the circumference and find the height of the roll with a ruler, and the work is shown for estimating the area by multiplying.
- Work is shown for finding the area of the flattened cardboard, and the results are compared to the estimate.

2. *Answer should include, but is not limited to:* A paper net for the can with the shapes described as two circles and one rectangle. An explanation that one dimension of the rectangle is the circumference of the can, and the other dimension of the rectangle is the height of the can. An explanation of how to find the surface area of the can by finding the surface areas of the shapes in the net.

Find the area of the 2 circles and the rectangle. Then add.

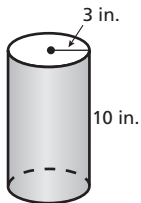
3. *Sample answers:*

- radius  $\approx 1.5 \text{ in.}$ , height  $\approx 4 \text{ in.}$ ,  
surface area  $\approx 52 \text{ in.}^2$
- radius  $\approx 1.25 \text{ in.}$ , height  $\approx 4.5 \text{ in.}$ ,  
surface area  $\approx 45 \text{ in.}^2$
- radius  $\approx 2.75 \text{ in.}$ , height  $\approx 6 \text{ in.}$ ,  
surface area  $\approx 151 \text{ in.}^2$
- radius  $\approx 1.75 \text{ in.}$ , height  $\approx 1.5 \text{ in.}$ ,  
surface area  $\approx 36 \text{ in.}^2$

# Record and Practice Journal Answer Key

4. Add twice the area of a circular base to the product of the circumference times the height of the cylinder.

Sample answer:



$$\begin{aligned} S &= 2\pi r^2 + 2\pi rh \\ &= 2(3.14)3^2 + 2(3.14)(3)10 \\ &= 244.92 \end{aligned}$$

The surface area is about 245 square inches.

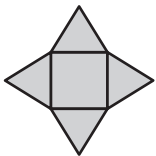
5. c.  $\frac{355}{113}$

## 6.3 Practice

- $112\pi \approx 351.7 \text{ m}^2$
- $270\pi \approx 847.8 \text{ ft}^2$
- $48\pi \approx 150.7 \text{ m}^2$
- $56\pi \approx 175.8 \text{ in.}^2$
- $1440\pi \approx 4522 \text{ mm}^2$
- about  $432.9 \text{ in.}^2$

## 6.4 Activity

1. Answer should include, but is not limited to:

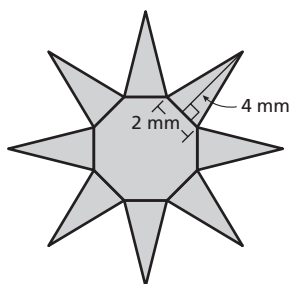


A scale model for a net of one of the four pyramids with the model slant height and base length labeled and scale included or explained.

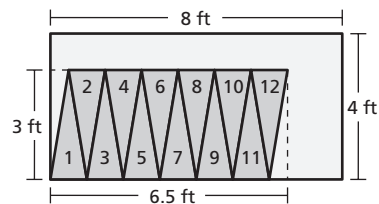
The net is formed into a pyramid.

- $SA = 85,560 \text{ m}^2$
  - $SA = 1404 \text{ m}^2$
  - $SA = 1960 \text{ m}^2$
  - $SA = 1276 \text{ m}^2$
2. a. The pyramid is octagonal because its base is an 8-sided polygon.

- b.  $32 \text{ mm}^2$



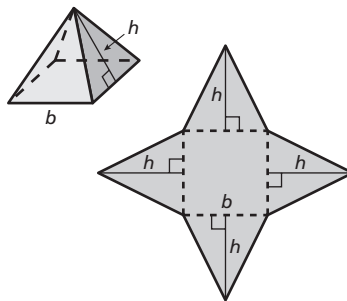
3. a.  $18 \text{ ft}^2$  b. Yes.



4. Find the area of the base. Add to it the area of the lateral faces. Each lateral face is a triangle with base  $b$ , height  $h$  (slant height), and area  $\frac{1}{2}bh$ . So,

the total area of  $n$  lateral faces is  $n\left(\frac{1}{2}bh\right)$ .

Sample answer:



In a pyramid with a square base,  $S = b^2 + 4\left(\frac{1}{2}bh\right)$ .

## 6.4 Practice

- $429 \text{ cm}^2$
- $143.1 \text{ yd}^2$
- $123.6 \text{ ft}^2$
- $1609.1 \text{ m}^2$
- $20 \text{ in.}$
- $156 \text{ cm}^2$

## 6.5 Activity

- The circumference is  $5\pi$  because the distance around the circle is the same as the distance around the remaining part of the original circle with one part removed.
  - $2.5 \text{ in.}$
  - $9\pi \text{ in.}^2 \approx 28.26 \text{ in.}^2$
  - $7.5\pi \text{ in.}^2 \approx 23.55 \text{ in.}^2$
  - The surface area of the cone is the surface area of its new circular base plus the lateral surface area which is the same as the area of the original circle with one part missing;  
 $S = 13.75\pi \text{ in.}^2 \approx 43.175 \text{ in.}^2$

# Record and Practice Journal Answer Key

2.

Radius of Base	$\frac{5}{2}$ in.
Slant Height	3 in.
Surface Area	$3\pi\left(\frac{5}{2}\right) + \left(\frac{5}{2}\right)^2 \pi$ in. <sup>2</sup>

Radius of Base	$\frac{4}{2}$ in.
Slant Height	3 in.
Surface Area	$3\pi\left(\frac{4}{2}\right) + \left(\frac{4}{2}\right)^2 \pi$ in. <sup>2</sup>

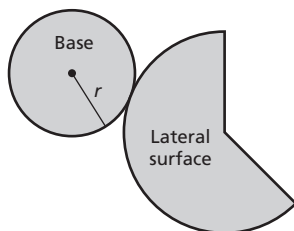
Radius of Base	$\frac{3}{2}$ in.
Slant Height	3 in.
Surface Area	$3\pi\left(\frac{3}{2}\right) + \left(\frac{3}{2}\right)^2 \pi$ in. <sup>2</sup>

Radius of Base	$\frac{2}{2}$ in.
Slant Height	3 in.
Surface Area	$3\pi\left(\frac{2}{2}\right) + \left(\frac{2}{2}\right)^2 \pi$ in. <sup>2</sup>

Radius of Base	$\frac{1}{2}$ in.
Slant Height	3 in.
Surface Area	$3\pi\left(\frac{1}{2}\right) + \left(\frac{1}{2}\right)^2 \pi$ in. <sup>2</sup>

3. *Answer should include, but is not limited to:* Story about real-life cones, labeled diagram, reason for wanting the surface area, estimate of surface area.

4. The surface area of a cone is the sum of the areas of the base and the lateral surface.



## 6.5 Practice

- $90\pi \approx 282.6$  in.<sup>2</sup>
- $144\pi \approx 452.2$  m<sup>2</sup>
- 6 ft
- 12 in.
- $5\pi \approx 15.7$  in.<sup>2</sup>
- $96\pi \approx 301.4$  in.<sup>2</sup>

## 6.6 Activity

- cone, cylinder, square pyramid, square prism
  - Sample answer:* Find the lateral surface areas of the four solids and add them. A net is helpful in labeling the dimensions of the solids.

2.

Base of $n$ blocks	1	2	3	4	5
Surface Area	6	14	24	36	50

For each 1 unit increase of  $n$ , the increase in surface area is two square units greater than the last increase. For 10 blocks,  $S = 150$ .

- Answer should include, but is not limited to:* A discussion about the flat roof being cheapest and a guess at the roof that is most expensive based on surface area and possibly other real-life factors.
- Make a net of the two-dimensional shapes that represents the surfaces of the composite solid. Find the areas and add them.
- Answer should include, but is not limited to:* A design of a building with a mansard roof and a turret with a conical roof. A calculation of the total surface area of the two roofs.

## 6.6 Practice

- a rectangular prism and a cylinder;  
 $406 + 8\pi \approx 431.1$  cm<sup>2</sup>
- a cylinder and a cone;  $1125\pi \approx 3532.5$  mm<sup>2</sup>
- a rectangular prism and a rectangular pyramid;  
160 ft<sup>2</sup>
- two triangular pyramids; 150 in.<sup>2</sup>
- $96 + 2\pi \approx 102.3$  in.<sup>2</sup>

## Chapter 7

### Fair Game Review

- yes;  $\frac{10}{5} = \frac{6}{3}$
- no;  $\frac{7}{4} \neq \frac{10}{7}$
- no;  $\frac{24}{12} \neq \frac{7}{5}$
- yes;  $\frac{2}{3} = \frac{6}{9}$

# Record and Practice Journal Answer Key

5. yes;  $\frac{5}{10} = \frac{6}{12}$

6. yes;  $\frac{12}{9} = \frac{20}{15}$

7. no;  $\frac{3}{1} \neq \frac{2}{0.5}$

8. 4

9. 2.4

10. 12

11. 10

12. 20

13. 25

14.  $2\frac{5}{8}$  in.

## 7.1 Activity

1. a. Estimate each pearl as a cube with side length 1 centimeter. Find how many cubes would fit in the treasure chest.

b. You could weigh one pearl. Then weigh all the pearls to determine the number of pearls in the treasure chest.

c. \$34,560,000

2. a.  $V = Bh$     b. 6; 12; 18; 24; 30

Both formulas give the same volume.

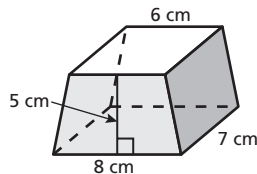
3.  $V = Bh$ , where  $B$  is the area of the base and  $h$  is the height of the prism.

4. a. Yes, although the “height” would be a very small number.

b. Find the volume of a ream of paper and divide by 500.

5. Find the area of the base and multiply it by the height of the prism.

6. *Sample answer:*  
245 cm<sup>3</sup>



## 7.1 Practice

1. 60 in.<sup>3</sup>

2. 960 m<sup>3</sup>

3. 90 ft<sup>3</sup>

4. 66 cm<sup>3</sup>

5. 300 ft<sup>3</sup>

6. 880 m<sup>3</sup>

7. Box 1; it has a larger volume.

## 7.2 Activity

1. a. *Sample answer:* using a dime,  $0.81\pi$  cm<sup>2</sup>

b. *Sample answer:* using a dime,  $1.296\pi$  cm<sup>3</sup>

c.  $V = Bh = \pi r^2 h$

2. a. *Sample answer:*

small: 2 inch radius, 3 inch height

medium: 2 inch radius, 5 inch height

large: 2 inch radius, 8 inch height

b. *Sample answer:* small: \$2, medium: \$5, large: \$8

c. *Sample answer:* No, but they should be because the person is paying for the amount of wax to make each candle, which is the volume of the wax.

3. Pour water into a beaker until it flows out the side tube. Place an empty cylinder at the end of the side tube. Gently lower the object into the beaker. The volume of the object is equal to the amount of water that flows into the cylinder.

4. a. *Sample answer:* The one on the right because it is taller.

b. Each cylinder has a volume of  $36\pi$  cubic units.

5. Find the area of one of the bases, which is a circle,  $\pi r^2$ . Then multiply by the height of the cylinder.

6. Both formulas are  $Bh$ , where  $B$  is the area of the base and  $h$  is the height.

## 7.2 Practice

1.  $180\pi \approx 565.2$  cm<sup>3</sup>

2.  $160\pi \approx 502.4$  in.<sup>3</sup>

3.  $\frac{28}{3\pi} \approx 3$  in.

4.  $\frac{325}{8\pi} \approx 13$  cm

5. *Sample answer:* The volume will be multiplied by 4.

6.  $45\pi \approx 141.3$  in.<sup>3</sup>

## 7.3 Activity

1. 3;  $V = \frac{1}{3}Bh$

2. *Sample answer:* The size of the pyramid and the sizes of the pieces used would affect how long it took to build.

The Cholula Pyramid in Mexico took longer to build because its volume is almost twice the volume of the Cheops Pyramid in Egypt.



# Record and Practice Journal Answer Key

3.

Pyramid	Volume (cubic units)
1	$\frac{1}{3}$
2	$\frac{8}{3}$
3	9
4	$\frac{64}{3}$
5	$\frac{125}{3}$

If the pyramid has a square base with lengths equal to the height, then the volume is equal to the side length cubed divided by three.

$$\frac{8000}{3} \text{ cubic units}$$

4. Volume of prism =  $2 \cdot 3 \cdot 5 = 30$

a.  $V = \frac{1}{3}(3 \cdot 5)(2) = 10$

b.  $V = \frac{1}{3}(2 \cdot 3)(5) = 10$

c.  $V = \frac{1}{3}(2 \cdot 5)(3) = 10$

5. Find the area of the base and multiply it by the height of the pyramid. Then divide by 3.

6.  $V = \frac{1}{3}Bh$

## 7.3 Practice

1.  $48 \text{ ft}^3$       2.  $120 \text{ yd}^3$       3.  $240 \text{ mm}^3$

4.  $60 \text{ m}^3$       5.  $20 \text{ ft}^3$       6.  $80 \text{ in.}^3$

## 7.4 Activity

1. square and rectangle:  $\ell w$

triangle:  $\frac{1}{2}bh$

circle:  $\pi r^2$

2. The volume of the stack does not change.

3. Surface Area of a Right Prism

$$= 2\ell w + 2\ell h + 2wh$$

Surface Area of a Right Pyramid

$$= \text{area of bases} + \text{areas of lateral faces}$$

Surface Area of a Right Cylinder

$$= 2\pi r^2 + 2\pi rh$$

$$\text{Surface Area of a Right Cone} = \pi r^2 + \pi r\ell$$

4. Surface Area

$$= \text{area of base(s)} + \text{area of lateral surfaces}$$

Prisms and Cylinders:

$$\text{Volume} = (\text{area of base}) \times (\text{height})$$

Pyramids and Cones:

$$\text{Volume} = \frac{1}{3} \left( \begin{array}{l} \text{volume of prism or cylinder} \\ \text{with same base and height} \end{array} \right)$$

## 7.4 Practice

1.  $48\pi \approx 150.7 \text{ m}^3$       2.  $33\pi \approx 103.6 \text{ ft}^3$

3.  $\frac{245}{6}\pi \approx 128.2 \text{ cm}^3$       4. 6.3 mm

5.  $\frac{471}{50\pi} \approx 3 \text{ cm}$       6.  $\frac{28}{3}\pi \approx 29.3 \text{ in.}^3$

7. 12 candles

## 7.5 Activity

1. a. *Sample answer:*  $0.15 \text{ in.}^3$ ; The head is made up of two cylinders. The larger one has a radius of about 0.3 inch and a height of about 0.5 inch. The smaller one has a radius of about 0.15 inch and a height of about 0.1 inch. So, the volume of the head is about

$$\begin{aligned} V &= \pi(0.3)^2(0.5) + \pi(0.15)^2(0.1) \\ &= 0.04725\pi \\ &\approx 0.15. \end{aligned}$$

b. *Sample answer:*  $0.14 \text{ in.}^3$ ; The leg is roughly made up of a cylinder and two rectangular prisms. The cylinder has a radius of about 0.2 inch and a height of about 0.4 inch. The prism below the cylinder has a length of about 0.4 inch, a width of about 0.4 inch, and a height of about 0.3 inch. The other prism has a length of about 0.5 inch, a width of about 0.4 inch, and a height of about 0.2 inch. So, the volume of a leg is about

$$\begin{aligned} V &= \pi(0.2)^2(0.4) + (0.4)(0.4)(0.3) \\ &\quad + (0.5)(0.4)(0.2) \\ &\approx 0.14. \end{aligned}$$

# Record and Practice Journal Answer Key

2. a. *Sample answer:* Find the volume using the outside dimensions of the rectangular prism and subtract out the volume using the inside dimensions to find the amount of plastic used for the prism. Do the same for the three cylinders inside the block. Then add the results together and add the volume of the eight studs on top of the block.
- b. about 3.1 in.<sup>3</sup> of water
3. *Sample answer:* Think of the composite solid as two or more basic solids. Find the volume of the basic solids, then add or subtract.

## 7.5 Practice

1. 144 ft<sup>3</sup>                      2. 120 ft<sup>3</sup>
3.  $20,680\pi \approx 64,935.2 \text{ mm}^3$
4. 8 in.<sup>3</sup>                      5.  $144\pi \approx 452.2 \text{ in.}^3$

## 7.6 Activity

1. a.

<b>Radius</b>	1	1	1	1	1
<b>Height</b>	1	2	3	4	5
<b>Surface Area</b>	$4\pi$	$6\pi$	$8\pi$	$10\pi$	$12\pi$
<b>Volume</b>	$\pi$	$2\pi$	$3\pi$	$4\pi$	$5\pi$

As the height increases by 1, the surface area increases by  $2\pi$  and the volume increases by  $\pi$ . The solids are not similar. The ratio of the radii is not equal to the ratio of the heights between two cylinders.

b.

<b>Radius</b>	1	2	3	4	5
<b>Height</b>	1	2	3	4	5
<b>Surface Area</b>	$4\pi$	$16\pi$	$36\pi$	$64\pi$	$100\pi$
<b>Volume</b>	$\pi$	$8\pi$	$27\pi$	$64\pi$	$125\pi$

The solids are similar. The ratio of the radii is equal to the ratio of the heights between two cylinders.

2.

<b>Base Side</b>	6	12	18	24	30
<b>Height</b>	4	8	12	16	20
<b>Slant Height</b>	5	10	15	20	25
<b>Surface Area</b>	96	384	864	1536	2400
<b>Volume</b>	48	384	1296	3072	6000

The solids are similar. The ratios of the base sides, heights, and slant heights are the same between two pyramids.

3. The surface area changes by a factor of  $k^2$ .
4. The volume changes by a factor of  $k^3$ .
5. a. 25 times greater;  $5^2 = 25$   
b. 125 times greater;  $5^3 = 125$

## 7.6 Practice

1. no                              2. yes
3.  $s = 4.5 \text{ cm}$ ,  $\ell = 3.75 \text{ cm}$
4.  $h = 0.5 \text{ cm}$     5.  $352 \text{ m}^2$             6.  $1024 \text{ mm}^3$
7. No. The corresponding linear measures are not proportional.

## Chapter 8

### Fair Game Review

1. a. 5    b. 4.5    c. 3    d. 5
2. a. 825    b. 550    c. none    d. 1800
3. a. 18    b. 19    c. 19    d. 11
4. a. 22.5    b. 20    c. 10 and 20    d. 40
5. a. 8.4    b. 8    c. none    d. 5
6. a.  $2\frac{3}{7}$     b. 3    c. 3    d. 5
7. mean: 103, median: 105.5, mode: none, range: 23
8. a. mean: 83, median: 82.5, modes: 84 and 79, range: 29  
b. mean or median  
c. *Sample answer:* If both of the students have low scores, then it will lower the mean and median. If both of the students have high scores, then it will increase the mean and median. If the scores are split or average, the answers could stay the same.

### 8.1 Activity

1. a. 58 numbers; There are 58 dots.  
b. 12 numbers; The interval 90–99 has 12 dots.  
c. yes; 6 times; There are 6 ones beside 9 in the plot on the right.  
d. 0, 1, 2, 2, 3, 4, 4, 7, 8, 9, 12, 12, 15, 16, 17, 18, 19, 22, 22, 26, 28, 29, 35, 38, 39, 42, 47, 54, 55, 62, 67, 68, 72, 73, 76, 77, 79, 79, 82, 82, 84, 85, 85, 86, 88, 89, 91, 91, 91, 91, 91, 91, 92, 92, 92, 92, 93, 93  
e. THE STEM SHOWS THE TENS  
THE LEAVES SHOW THE ONES

# Record and Practice Journal Answer Key

2. a.	1	7 8
	2	3 4 6 8
	3	2 4 5 7 7 9
	4	0 1 2 2 2 5 5 5
	5	0 2 3 4 8 8
	6	0 1 2 3
	7	2 3

b. 44 mm    c. 42 mm

d. It is centered around the 40–50 mm range.

3. *Answer should include, but is not limited to:* Check that the stem-and-leaf plot is correct. There should be 30 leaves.
4. *Sample answer:* Choose leaves to represent the smallest place value. The rest of the number will be the stem. Then order the data from least to greatest and place it in a stem-and-leaf plot.
5. *Sample answer:* An accountant collects data by receiving business transaction statements. The data is organized in tables.

## 8.1 Practice

1.	0	9	2.	6	0 8
	1	0 2 4 6 6 9		7	5 5 6 9
	2	1 1 5 8		8	1 2 6 8
	3	2		9	1 2

3.	0	5 7 8
	1	1 4 5
	2	0 2

The data is evenly distributed.

4.	4	9
	5	5 7
	6	2
	7	2 5 8

The data shows that few students do less than 50 minutes of practice.

5. a. 6 students  
b. mean: 18.2, median: 19, mode: none, range: 28

## 8.2 Activity

1. a. *Sample answer:*

skew: salaries of Americans  
normal: grades on a math test  
bimodal: heights of males and females  
flat: speeds on a road

- b. skew: The mean and median are towards the left. The mode could be anywhere.

normal: The mean and median are towards the middle. The mode could be anywhere.

bimodal: The mean and median are towards the middle. The mode is probably near one of the high points.

flat: The mean and median are in the middle. The mode could be anywhere.

- c. The normal, bimodal, and flat distributions all have means that are about the same as their medians. This is because the data values are symmetric about the center of each distribution.
- d. skew: The distribution is leaning or “skewed” to one side.  
normal: The average value occurs the most often, which is what you would expect (i.e., what is normal).

bimodal: The distribution looks like it has two modes.

flat: The distribution has a flat top, as any value is just as likely to occur as any other.

2. question 1: bimodal distribution (right graph)  
question 2: normal distribution (left graph)

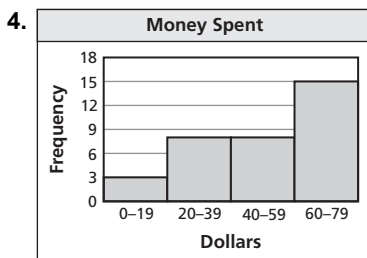
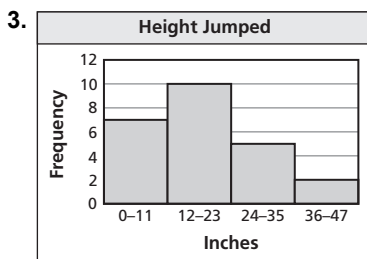
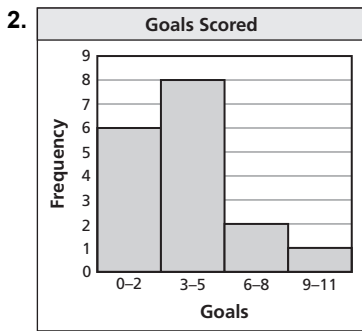
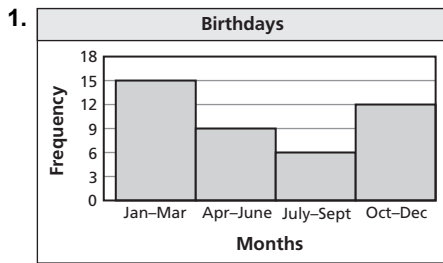
3. *Answer should include, but is not limited to:* Check that stem-and-leaf plots and histograms are done correctly. The first histogram should be roughly flat because each number is equally likely to be rolled. The second histogram should be normal because there are more ways to roll the middle numbers than the outer numbers.

4. Histograms show where most of the data falls in comparison to other data values. The shape the histogram forms allows you to determine how the data is distributed.

5. *Sample answer:* weights of dogs in your neighborhood; normal distribution

# Record and Practice Journal Answer Key

## 8.2 Practice



5. a. 9–10 minutes    b. 34 students    c. about 41%

## 8.3 Activity

1. a.  $55^\circ$   
 b.  $360^\circ$   
 c.  $\frac{x}{600} = \frac{55}{360}$ ; about 92 students

- d. baseball:  $25^\circ$ ; about 42 students  
 basketball:  $60^\circ$ ; 100 students  
 soccer:  $15^\circ$ ; 25 students  
 hockey:  $20^\circ$ ; about 33 students  
 track:  $25^\circ$ ; about 42 students  
 wrestling:  $25^\circ$ ; about 42 students  
 swimming:  $25^\circ$ ; about 42 students  
 gymnastics:  $40^\circ$ ; about 67 students  
 skating:  $30^\circ$ ; 50 students  
 other:  $40^\circ$ ; about 67 students

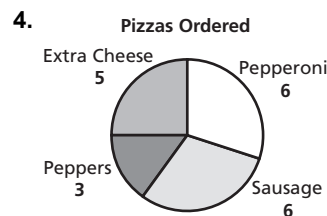
2. Answer should include, but is not limited to: Check that angles are found correctly. Compare results to Activity 1.

3. For each category in the survey, set up and solve the proportion  $\frac{\text{category}}{\text{total}} = \frac{x}{360}$  to find the angle measure  $x$  for the category. Then use the angle measures to draw the circle graph.

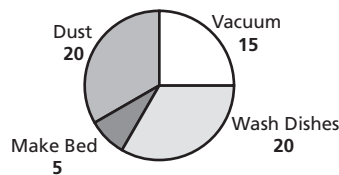
4. Answer should include, but is not limited to: Students should be able to determine the number of people who chose each category if the total number of people surveyed is given.

## 8.3 Practice

1.  $180^\circ$     2.  $234^\circ$     3.  $32.4^\circ$



5. Time Spent on Chores (in minutes)



6. a. 28% of students chose apple juice while only 20% chose grape juice.  
 b. grape: 5 students; orange: 10 students; apple: 7 students; other: 3 students

# Record and Practice Journal Answer Key

## 8.4 Activity

- a. *Sample answer:* A large enough sample of teens and young adults in Florida to provide accurate data that is proportional to the population. The same goes for teens and young adults in the United States.

b. *Sample answer:*

  - $\frac{1}{3}$  feel text messaging plans are restrictive.
  - 40% feel text plans cause higher bills.
  - Average texts sent per day is 6–7.
  - More than 50% would send more if restrictions removed.

c. *Sample answer:*

  - How many texts do you send per day?
  - What effect does your plan have on your bill?
  - Is your cell phone plan restrictive or non-restrictive?
- a. *Sample answer:* no; It seems low.

b. *Sample answer:* Ask other student at school.

c–d. *Answer should include, but is not limited to:* A bar graph, stem-and-leaf plot, or histogram should be used to organize the data. Article should summarize the results of the survey and even compare it to the other survey.
- Answer should include, but is not limited to:* Questionnaire should either give shortcuts and ask what they represent or give words and ask for the shortcuts. Teenagers will probably know more of the shortcuts.
- Sample answer:* The results of a survey with a reasonable sample are representative of the general population, so they can be used to make predictions about the population.
- Answer should include, but is not limited to:* If questions are given, check to make sure they are not leading.

## 8.4 Practice

- population: all sports players; sample: members of the soccer team
- population: a box of crayons; sample: 8 crayons
- Sample A; This sample allows you to choose students in the entire school rather than a certain subject which would limit the grade level and age.
- Sample B; A larger sample will give better data.
- 192 students

## 8.4b Practice

- 3 ft
- 5.4 cm
- $2\frac{1}{4}$  in.
- 5 mm
- 8 yd
- 22 m
- 44 m
- 14.444 ft
- 47.1 in.
- $154 \text{ yd}^2$
- $28.26 \text{ cm}^2$
- $314 \text{ mm}^2$
- $339.12 \text{ ft}^2$ ; The garden area is  $\frac{3}{4}$  of a circle with a 12-foot radius.

## Chapter 9

### Fair Game Review

- $\frac{5}{6}$
- $\frac{1}{2}$
- $\frac{1}{2}$
- $\frac{9}{13}$
- $\frac{2}{3}$
- $\frac{5}{7}$
- $\frac{60}{90}, \frac{2}{3}$
- $\frac{14}{56}, \frac{1}{4}$
- 2 : 3
- 5 : 3
- 1 : 2
- 1 : 4
- 7 : 4
- 3 : 2
- 3 : 20

### 9.1 Activity

- a. Each spinner is divided into equal sections. All 4 outcomes are possible on the first 3 spinners. The likelihood of the outcomes differs on each spinner.

b. A; Most of the results move you forward or up.

c. D; Three of the four sections are up.

d–e. *Answer should include, but is not limited to:* Here are some generalizations about the spinners.

Spinner A: Sections for forward and up should be about the same. Sections for reverse and down should be about the same.

Spinner B: Sections for forward and down should be about the same. Sections for up and reverse should be about the same.

Spinner C: All sections should be about the same.

Spinner D: The section for up should be about 3 times larger than the section for forward.

f. *Sample answer:* Spinner D gives you the two directions you need most.
- Sample answer:* You can look at the possible choices and the total number of sections and see if any are more likely.

# Record and Practice Journal Answer Key

## 9.1 Practice

- a.** 4    **b.** red, red, red, red
- a.** 2    **b.** green, green
- a.** 3    **b.** yellow, yellow, yellow
- a.** 9  
**b.** red, red, red, red, yellow, yellow, yellow, green, green
- a.** 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25  
**b.** 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24  
**c.** 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19

## 9.2 Activity

- a.** *Sample answer:* Player 1 wins if the outcome is 1, 2, 3. Player 2 wins if the outcome is 4, 5, 6.  
**b.** *Sample answer:* No, because the game is fair.  
**c.**  $60^\circ$   
**d.**  $\frac{1}{6}$ ; There are 6 outcomes and only one is 1.
- a.**  $P(1) = \frac{1}{6}$ ,  $P(2) = \frac{1}{6}$ ,  $P(3) = \frac{1}{4}$ ,  
 $P(4) = \frac{1}{8}$ ,  $P(5) = \frac{1}{8}$ ,  $P(6) = \frac{1}{6}$ ;  
*Sample answer:* Yes, but the game is not fair.  
**b.**  $P(1) = \frac{1}{6}$ ,  $P(2) = \frac{1}{3}$ ,  $P(3) = \frac{1}{4}$ ,  
 $P(4) = \frac{1}{8}$ ,  $P(5) = \frac{1}{12}$ ,  $P(6) = \frac{1}{24}$ ;  
*Sample answer:* Yes, but the game is not fair.
- Spinner 1 is fair. Spinner 2a is not fair and Player 1 has a better chance of winning. Spinner 2b is fair.
- Take the number of favorable outcomes and divide by the total number of outcomes.
- Sample answer:* Meteorologists use probability when predicting whether it will rain or not.
- Player 2; Player 1 wins only if both cards are odd, but Player 2 wins if both cards are even or if one card is even and one card is odd.

## 9.2 Practice

- $\frac{1}{6}$     2.  $\frac{1}{6}$     3.  $\frac{1}{2}$     4.  $\frac{5}{6}$

5. not fair; your friend

6. fair

7. 18 ducks

## 9.3 Activity

2. **a–d.** *Answer should include, but is not limited to:*  
Bars for PPP and DDD should be about the same height. Bars for DPP and DDP should be about the same height and be about 3 times taller than the other bars.

3. **a–b.** three Ps:  $1; \frac{1}{8}$ , or 12.5%

one D and two Ps:  $3; \frac{3}{8}$ , or 37.5%

two Ds and one P:  $3; \frac{3}{8}$ , or 37.5%

three Ds:  $1; \frac{1}{8}$ , or 12.5%

**c.** *Answer should include, but is not limited to:*  
The numbers should be close.

4. The probabilities are based on the outcomes of an experiment.

5. *Sample answer:* Checking items that are shipped to see if they are damaged.

## 9.3 Practice

1.  $\frac{3}{10}$     2.  $\frac{3}{20}$     3.  $\frac{9}{10}$     4.  $\frac{1}{2}$

5. 15 boys' names    6. 6 times

7. The experimental probability is  $\frac{10}{24} \approx 0.417 \approx 42\%$ . The theoretical probability is  $\frac{1}{2} = 0.5 = 50\%$ . The theoretical probability is greater than the experimental probability.

## 9.4 Activity

1. **a.**  $\frac{1}{3}$

**b.** yes; By looking at the second draw possibilities in the tree diagram, it is clear that if a green marble is drawn first, then there is a 50% chance of drawing a green marble on the second draw. But if the purple marble is drawn first, then there is a 100% chance of drawing a green marble on the second draw.

# Record and Practice Journal Answer Key

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

b. no; Because the marble is replaced between draws, the probability of getting a green marble is the same for both draws.

3. *Answer should include, but is not limited to:*  
The experimental probabilities should be close to the probabilities found in Activities 1 and 2.

4. Dependent events means that the occurrence of one event will affect the occurrence of another event. Independent events means that the occurrence of one event will not affect the occurrence of another event.

*Sample answer:*

independent events: flipping a coin twice

dependent events: choosing two letters from a bag containing the 26 letters of the alphabet

## 9.4 Practice

1. independent; the occurrence of one event does not affect the likelihood that the other event will occur

2. independent; the occurrence of one event does not affect the likelihood that the other event will occur

3. dependent; the occurrence of one event does affect the likelihood that the other event will occur

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

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

6.  $\frac{13}{204}$

## Chapter 10

### Fair Game Review

1. 11      2. 17      3. 6      4. 30

5.  $e + 7 = 22$ ; 15 emails

6.  $\frac{1}{4}d = 6$ ; 24 miles

7. (3, 4)

8. (-7, -3)

9. (0, -5)

10. (-2, 6)

11. Point G

12. Point J

13. Point H

14. Point C

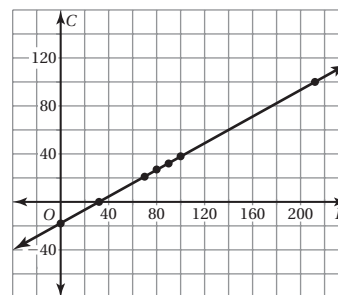
## 10.1 Activity

1.

<b>F</b>	0°	32°	70°	80°
<b>C</b>	-18°	0°	21°	27°

<b>F</b>	90°	100°	212°
<b>C</b>	32°	38°	100°

2. a-b.



c.  $\frac{5}{9}$       d.  $C = \frac{5}{9}(F - 32)$

3. a. 66.2°F      b. 95°F      c. 82.4°F      d. 42.8°F

4. You can use the equation  $C = \frac{5}{9}(F - 32)$  to convert between the Fahrenheit and Celsius scales.  
*Sample answer:* Convert 14°F to Celsius.

$$C = \frac{5}{9}(F - 32)$$

$$= \frac{5}{9}(14 - 32)$$

$$= \frac{5}{9}(-18)$$

$$= -10$$

14°F is equal to -10°C.

Convert 5°C to Fahrenheit.

$$C = \frac{5}{9}(F - 32)$$

$$5 = \frac{5}{9}(F - 32)$$

$$9 = F - 32$$

$$41 = F$$

5°C is equal to 41°F.

## 10.1 Practice

1.  $x = 2$

2.  $w = 6$

3.  $k = 2$

4.  $b = 4$

5.  $c = 1$

6.  $y = 14$

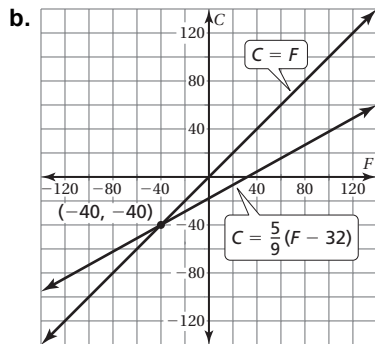
7. 3 ft

8.  $3x + 5x = 40$ ; \$5

# Record and Practice Journal Answer Key

## 10.2 Activity

1. a.  $-40^\circ$



c.  $x = -40$

d. yes; *Sample answer:* Solving the equation is the best method because it takes the least amount of time.

3. Collect the variable terms on one side and the constant terms on the other side.

*Sample answer:*

$$5x + 4 = 2x + 7$$

$$5x = 2x + 3$$

$$3x = 3$$

$$x = 1$$

## 10.2 Practice

1.  $x = -7$       2.  $x = 2$       3.  $p = -7$   
 4.  $d = 5.25$     5.  $n = -18$     6.  $y = 2$   
 7. 20 containers      8. 137 boys; 185 girls

## 10.2b Practice

1. no solution      2. no solution      3. 0  
 4. no solution      5.  $-18$       6. no solution  
 7. no; The equation  $t + 8 = t + 12$  represents the amount you and your friend spend. Because  $8 \neq 12$ , the equation has no solution. So, it is not possible that you and your friend spend the same amount.  
 8. infinitely many solutions  
 9. 0      10.  $-6$   
 11. infinitely many solutions  
 12. no solution  
 13. infinitely many solutions

14. infinitely many solutions; The equation

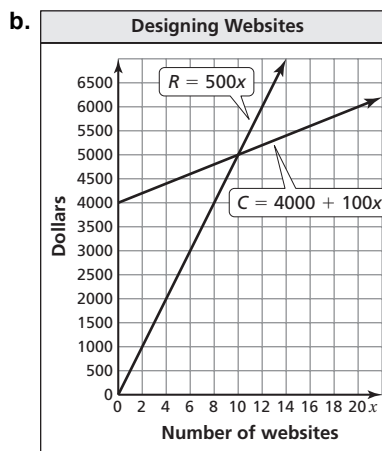
$2x \cdot 3 = \frac{1}{2}(4)(3x)$  is always true. So, there are infinitely many solutions.

## 10.3 Activity

1. a.

$x$	0	2	4	6	8	10	12
$C$	4000	4200	4400	4600	4800	5000	5200
$R$	0	1000	2000	3000	4000	5000	6000

$x = 10$



c.  $x = 10$

d. Because it is where the revenue equals the cost. So you “break-even” at this point.

2. *Answer should include, but is not limited to:* Make sure students say whether the business provides a product or a service. Make sure the break-even point is correct.  
 3. You can use a table to find the value of the variable that makes the value of each side of the equation the same. You can graph each side of the equation, and the  $x$ -coordinate of the point of intersection is the solution of the equation.

*Sample answer:* You can set the costs of bowling at two places equal to find after how many games the cost will be the same.

## 10.3 Practice

1.  $p = -2$       2.  $y = -\frac{1}{2}$       3.  $p = 14$   
 4.  $d = -6$       5.  $x = 1$       6.  $x = 1$   
 7. a. 20 months  
 b. Company A because the cost is \$20 less after 2 years.



# Record and Practice Journal Answer Key

## 10.4 Activity

1. a. 1   b. -1   c.  $\frac{1}{2}$    d.  $-\frac{1}{2}$    e. 2   f. -2

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

5. -2; 4;  $-\frac{1}{2}$       6. 4; 2; 2

7. Sample answer: (-2, 2), (-1, 0); -2; 1; -2

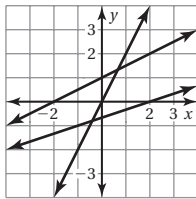
8. 1; 4;  $\frac{1}{4}$       9. -6; 9;  $-\frac{2}{3}$       10. -3; 12;  $-\frac{1}{4}$

11. 6; 9;  $\frac{2}{3}$       12. -12; 15;  $-\frac{4}{5}$

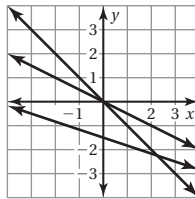
13. 0; 4; 0      14. -4; 1; -4

15. The slope can describe how steep the line is and whether it is increasing or decreasing.

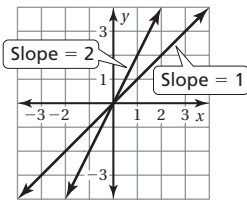
a. Sample answer:



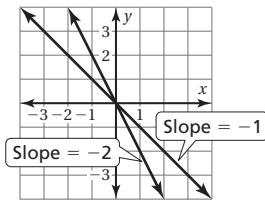
b. Sample answer:



16. A line with a slope of 2 is steeper than a line with a slope of 1.



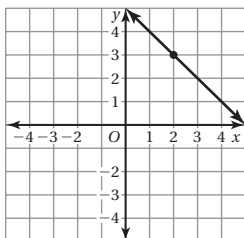
17. A line with a slope of -2 is steeper than a line with a slope of -1.



## 10.4 Practice

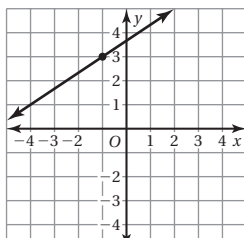
1. 1

3.

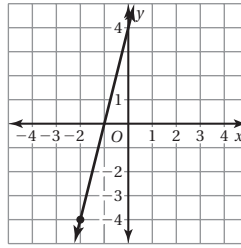


2. 4

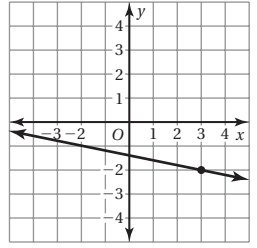
4.



5.



6.



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

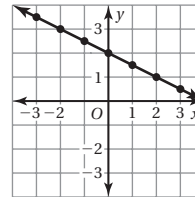
## 10.5 Activity

1. a.

Input, $x$	-3	-2	-1	0
Output, $y$	$3\frac{1}{2}$	3	$2\frac{1}{2}$	2

Input, $x$	1	2	3
Output, $y$	$1\frac{1}{2}$	1	$\frac{1}{2}$

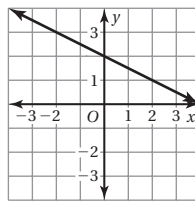
b-c.



The points form a line.

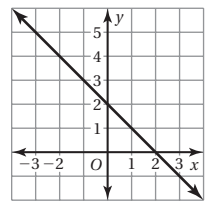
d. Sample answer: (4, 0), (-4, 4); (6, -1); yes

2.



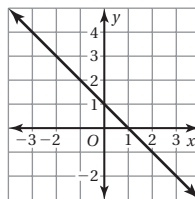
line; (0, 2);  $-\frac{1}{2}$

3.



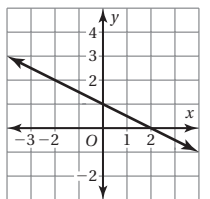
line; (0, 2); -1

4.



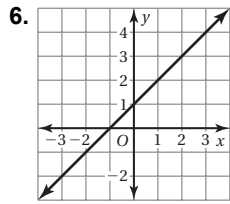
line; (0, 1); -1

5.

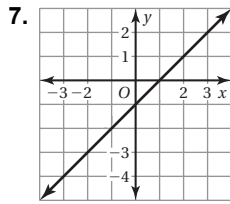


line; (0, 1);  $-\frac{1}{2}$

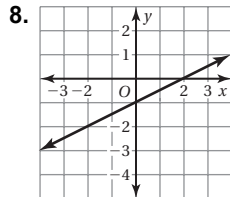
# Record and Practice Journal Answer Key



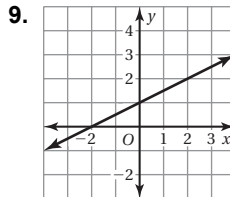
line;  $(0, 1)$ ; 1



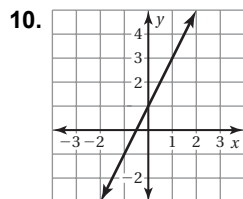
line;  $(0, -1)$ ; 1



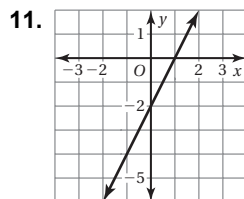
line;  $(0, -1)$ ;  $\frac{1}{2}$



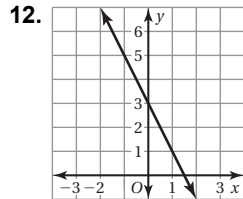
line;  $(0, 1)$ ;  $\frac{1}{2}$



line;  $(0, 1)$ ; 2



line;  $(0, -2)$ ; 2



line;  $(0, 3)$ ;  $-2$

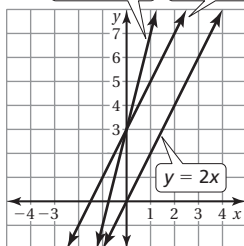
13. A line with a slope of  $m$  that intersects the  $y$ -axis at  $(0, b)$

a. It affects the steepness of the line. It determines whether the graph falls or rises from left to right.

b. It affects where the line crosses the  $y$ -axis.

c. Sample answer:

$y = 4x + 3$     $y = 2x + 3$



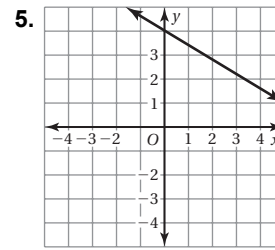
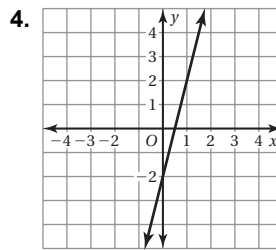
14. It is linear because it forms a line. It is a function because for every input  $x$ , there is exactly one output  $y$ .

## 10.5 Practice

1.  $\frac{5}{8}$ ;  $-6$

2.  $-7$ ; 5

3.  $-\frac{1}{2}$ ;  $\frac{5}{2}$



6.  $y = \frac{1}{3}x + 2$

7.  $y = -6x - 2$

8. The  $y$ -intercept represents the 8 songs you already know. The slope of 3 represents you can learn 3 songs per week.

## Chapter 11

### Fair Game Review

1. 3

2. 24

3. 4.5

4. 18

5. 8

6. 8

7. 30

8. 4

9. 9

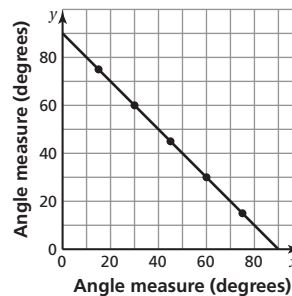
10. 9

11. 60 feet

### 11.1 Activity

1. a.

$x$	$15^\circ$	$30^\circ$	$45^\circ$	$60^\circ$	$75^\circ$
$y$	$75^\circ$	$60^\circ$	$45^\circ$	$30^\circ$	$15^\circ$



The function is linear.

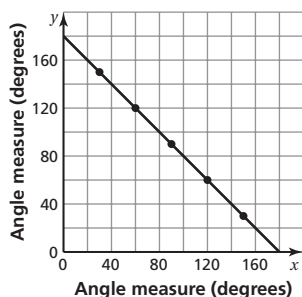
$y = 90 - x$

$x$ -values greater than 0 and less than 90.

# Record and Practice Journal Answer Key

b.

$x$	$30^\circ$	$60^\circ$	$90^\circ$	$120^\circ$	$150^\circ$
$y$	$150^\circ$	$120^\circ$	$90^\circ$	$60^\circ$	$30^\circ$



The function is linear.

$$y = 180 - x$$

$x$ -values greater than 0 and less than 180.

2. a. always    b. sometimes    c. never
3. a.  $\angle BDE$  and  $\angle DBE$ ;  $\angle CBD$  and  $\angle CDB$ ;  
 $\angle CBD$  and  $\angle DBE$ ;  $\angle CDB$  and  $\angle BDE$
- b.  $\angle A$  and  $\angle ABE$ ;  $\angle A$  and  $\angle C$ ;  $\angle A$  and  $\angle BED$ ;  
 $\angle A$  and  $\angle BEF$ ;  $\angle A$  and  $\angle F$ ;  $\angle ABE$  and  $\angle C$ ;  
 $\angle ABE$  and  $\angle BED$ ;  $\angle ABE$  and  $\angle BEF$ ;  
 $\angle ABE$  and  $\angle F$ ;  $\angle C$  and  $\angle BED$ ;  
 $\angle C$  and  $\angle BEF$ ;  $\angle C$  and  $\angle F$ ;  
 $\angle BED$  and  $\angle BEF$ ;  $\angle BED$  and  $\angle F$ ;  
 $\angle BEF$  and  $\angle F$ ;  $\angle A$  and  $\angle CDE$ ;  
 $\angle A$  and  $\angle CBE$ ;  $\angle ABE$  and  $\angle CBE$ ;  
 $\angle ABE$  and  $\angle CDE$ ;  $\angle BEF$  and  $\angle CBE$ ;  
 $\angle BEF$  and  $\angle CDE$ ;  $\angle F$  and  $\angle CBE$ ;  
 $\angle F$  and  $\angle CDE$ ;  $\angle CBE$  and  $\angle C$ ;  
 $\angle CBE$  and  $\angle CDE$ ;  $\angle CBE$  and  $\angle BED$ ;  
 $\angle C$  and  $\angle CDE$ ;  $\angle CDE$  and  $\angle BED$
4. Two angles are complementary if the sum of their measures is  $90^\circ$ . Two angles are supplementary if the sum of their measures is  $180^\circ$ .

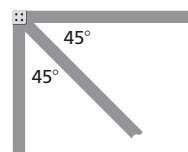
*Sample answer:*

complementary:  $25^\circ + 65^\circ = 90^\circ$

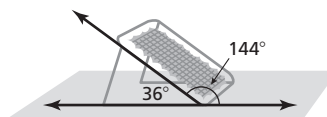
supplementary:  $117^\circ + 63^\circ = 180^\circ$

5. *Sample answer:*

complementary: two beams on a building



supplementary: the ground and a soccer ball-return net



## 11.1 Practice

1. complementary                      2. neither  
 3. supplementary                      4.  $x = 49$   
 5.  $x = 71$     6.  $x = 41$     7.  $x = 14$     8. 50.5

## 11.2 Activity

1. d. The sum of the angles is  $180^\circ$ .  
 e. yes; For all three triangles, the sum of the angles is  $180^\circ$ .  
 f. The sum of the angle measures of a triangle is  $180^\circ$ .
2. a. right triangle: a triangle with one  $90^\circ$  angle; second triangle  
 b. acute triangle: a triangle with all angles less than  $90^\circ$ ; first, fourth, and fifth triangles  
 c. obtuse triangle: a triangle with one angle greater than  $90^\circ$ ; third triangle  
 d. equiangular triangle: a triangle with 3 equal angles; fifth triangle  
 e. equilateral triangle: a triangle with 3 equal side lengths; fifth triangle  
 f. isosceles triangle: a triangle with 2 equal side lengths and 2 equal angles; first and fifth triangles
3. a. *Answer should include, but is not limited to:* Make sure students trace four triangles in the painting and they correctly classify each triangle.  
 b. *Answer should include, but is not limited to:* Make sure students use only triangles to make the painting, and that they correctly identify each one.

# Record and Practice Journal Answer Key

- You can classify them as acute, obtuse, right, or equiangular depending on their measures of angles.
- Answer should include, but is not limited to:* Make sure students correctly identify the triangles.

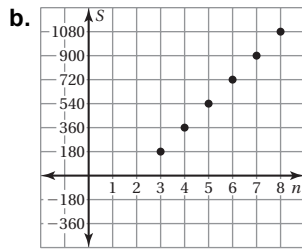
## 11.2 Practice

- $x = 58$ ; right
- $x = 26$ ; acute
- $x = 65$ ; acute, isosceles
- $x = 32.5$ ; obtuse, isosceles
- yes
- no;  $67^\circ$
- no;  $61^\circ$
- $x = 35$ ; isosceles

## 11.3 Activity

- b.**  $540^\circ$    **c.**  $720^\circ$    **d.**  $900^\circ$    **e.**  $1080^\circ$
- a.**

Sides, $n$	3	4	5	6	7	8
Angle Sum, $S$	180	360	540	720	900	1080



- $S = 180n - 360$
  - $n$  can be any integer greater than or equal to 3.
  - $1440^\circ$
- yes; You can still draw lines to divide the concave polygons into triangles. At least one of the angle measures in a concave polygon will be greater than  $180^\circ$ .
  - Sample answer:* Create examples of polygons and then draw lines to divide the polygon into triangles to find the sum of the angle measures. Then plot the number of sides and the sum of the angle measures and look for a pattern. Finally, write an equation to represent the data.

## 11.3 Practice

- $360^\circ$
- $540^\circ$
- $1800^\circ$
- 70
- 150
- $150^\circ$
- $135^\circ$
- concave
- convex
- $120^\circ$

## 11.4 Activity

- Choose an angle from  $\triangle XYZ$  and extend the two lines that make up the triangle. Then move  $\triangle XYZ$  down one of these lines and extend the line that has not been drawn yet. These three extended lines will intersect to form a triangle.

The ratios are the same. So, the corresponding angles of similar triangles are congruent.

- true; By definition of similar.  
true; By definition of similar.
  - true; By definition of similar.  
false; A square and a rhombus with the same length are not similar because they are not the same figure.
  - true; Shown in Activity 1.  
true; The similar quadrilaterals will have the same shape.
  - true; Shown in Activity 1.  
false; A square and a rectangle have congruent corresponding angles, but the ratio of their corresponding side lengths are not equal.
  - true; By definition of similar.  
false; A square and a rhombus with the same length do not have identical shapes.
- Sample answer:* If corresponding side lengths of two triangles are proportional, then the triangles are similar. If corresponding angles of two triangles are congruent, then the triangles are similar.  
*Sample answer:* Construction and architecture use triangles to form buildings

## 11.4 Practice

- Yes; the triangles have the same angle measures.
- No, the two triangles have different angle measures.
- 105
- 55
- 10 feet

# Record and Practice Journal Answer Key

## 11.5 Activity

1. Two lines are parallel if they do not intersect.  
*Sample answer:* Draw one line. Then, draw two points that are the same distance from the line. Use these two points to draw a parallel line.

Angles 1, 3, 5, and 7 are congruent. Angles 1 and 3 and angles 5 and 7 are vertical angles, which are congruent. Angles 3 and 7 are congruent because the corresponding angles the parallel lines form with the transversal are the same.

Angles 2, 4, 6, and 8 are congruent using the same reasoning.

2. a. Measure the vertical angles and corresponding angles and make sure they are congruent.  
 b. The studs are parallel and the board across the front is the transversal.
3. a. The rays will make the same angle with the ground. And because both triangles are right triangles, the other pair of corresponding angles are congruent.  
 b. You can use the proportion  $\frac{x}{5} = \frac{36}{3}$  and solve for  $x$ .

4. You can find angle measures and find missing dimensions of triangles. *Sample answer:* You can find angle measures that could be needed in construction.

5. a. Because you are not measuring the flagpole directly.  
 b–c. *Answer should include, but is not limited to:* The items students might need to take with them are paper, pencil, a yardstick, and a mirror.

## 11.5 Practice

1.  $\angle 1 = 112^\circ$ ;  $\angle 2 = 68^\circ$     2.  $\angle 1 = 95^\circ$ ;  $\angle 2 = 85^\circ$   
 3.  $\angle 1 = 146^\circ$ ;  $\angle 2 = 34^\circ$ ;  $\angle 3 = 146^\circ$ ;  $\angle 4 = 34^\circ$ ;  
 $\angle 5 = 146^\circ$ ;  $\angle 6 = 34^\circ$ ;  $\angle 7 = 146^\circ$   
 4.  $\angle 1 = 67^\circ$ ;  $\angle 2 = 113^\circ$ ;  $\angle 3 = 67^\circ$ ;  $\angle 4 = 113^\circ$ ;  
 $\angle 5 = 67^\circ$ ;  $\angle 6 = 113^\circ$ ;  $\angle 7 = 113^\circ$   
 5.  $30^\circ$     6.  $138^\circ$     7.  $28^\circ$     8.  $26^\circ$

## Chapter 12

### Fair Game Review

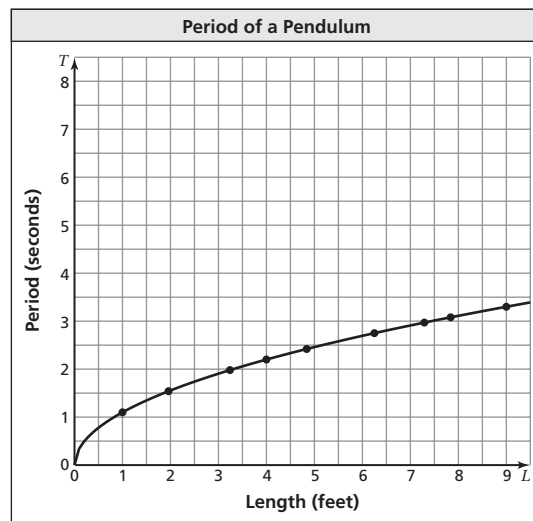
1. <    2. >    3. =    4. >

5–8. *Sample answers are given.*

5.  $-5.2, -5.3, -6.5$     6.  $2.56, 2.3, -3.2$   
 7.  $-3.18, -3.1, -2.05$     8.  $0.05, 0.3, 1.55$   
 9.  $12.49; 12.495; 12.55; 12.60; 12.63$   
 10. 167    11. 3    12. 63  
 13. 116    14.  $-51$     15. 1  
 16.  $\frac{24 + 32 + 30 + 28}{2}; 57$

## 12.1 Activity

1. a. 11 ft  
 b.  $s = \sqrt{81} = 9$  yd  
 c.  $s = \sqrt{324} = 18$  cm  
 d.  $s = \sqrt{361} = 19$  mi  
 e.  $s = \sqrt{2.89} = 1.7$  in.  
 f.  $s = \sqrt{4.41} = 2.1$  m  
 g.  $s = \sqrt{\frac{4}{9}} = \frac{2}{3}$  ft
2. 1.1, 1.54, 1.98, 2.2, 2.42, 2.75, 2.97, 3.08, 3.3



The function is not linear.

3. Find a number whose square is the area. *Sample answer:*  $A = 144 \text{ mm}^2$ , so  $s = 12 \text{ mm}$  because  $12 \times 12 = 144$ . You can check your answer by multiplying.

# Record and Practice Journal Answer Key

## 12.1 Practice

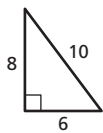
1. 4 and -4
2. 10 and -10
3. 14 and -14
4. 13
5.  $\frac{2}{15}$
6. -3.5
7. 21
8. 3
9. -9
10. 14 ft
11. 5 in.

## 12.2 Activity

1. e.  $a^2 + b^2 = c^2$
2. a. 5    b. 26    c.  $\frac{5}{6}$     d. 1
3. a. 12    b. 0.32

4. In a right triangle the sum of the squares of the lengths of the legs is equal to the square of the length of the hypotenuse.

Sample answer:



$$6^2 + 8^2 = 10^2$$

$$36 + 64 = 100$$

$$100 = 100$$

## 12.2 Practice

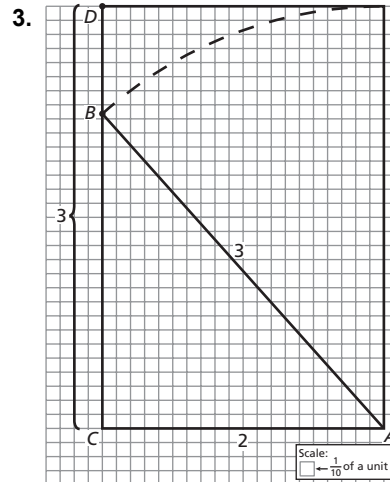
1. 35
2. 8
3. 5.5
4. 65 cm
5. 37 m
6. 6 in.

## 12.3 Activity

1. a. no; Because when each fraction is squared, it is not equal to 3.  
 b. 1.7320508; no; Because you approximated  $\sqrt{3}$ , which continues forever.  
 c. *Sample answer:* By squaring the fractions and seeing if he was close. Then, rewriting fractions and changing them slightly.

2. d.  $(BC)^2 + (AC)^2 = (AB)^2$   
 $(BC)^2 + 1^2 = 2^2$   
 $(BC)^2 + 1 = 4$   
 $(BC)^2 = 3$   
 $BC = \sqrt{3}$

e. about 1.7



$$(BC)^2 + (AC)^2 = (AB)^2$$

$$(BC)^2 + 2^2 = 3^2$$

$$(BC)^2 + 4 = 9$$

$$(BC)^2 = 5$$

$$BC = \sqrt{5}$$

$$\sqrt{5} \approx 2.2 \text{ (from grid paper)}$$

4. You can use geometry, as done in Activity 2, to estimate square roots that are irrational.

## 12.3 Practice

1. irrational; 12 is not a perfect square.
2. rational; It is the ratio of two integers.
3. rational; It is a repeating decimal.
4. 3
5. 8
6. -3

7. 12; 12 is to the right of  $\sqrt{88}$ .
8.  $-\sqrt{18}$ ;  $-\sqrt{18}$  is to the right of -6.
9.  $\sqrt{220}$ ;  $\sqrt{220}$  is to the right of 14.5.
10. 14.3 m/sec
11. 5.5 ft

## 12.4 Activity

1. c.  $\sqrt{\frac{5}{4}}$     f. 1.62
2. *Answer should include, but is not limited to:* Measurements will be different for different students, but ratios should be approximately 1.618.

# Record and Practice Journal Answer Key

3. *Sample answer:* The golden ratio is  $\frac{1 + \sqrt{5}}{2}$  which uses a square root. The Great Pyramids use the golden ratio.

## 12.4 Practice

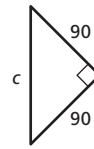
1.  $\frac{1 + \sqrt{3}}{8}$       2.  $\frac{2 - \sqrt{11}}{9}$       3.  $10\sqrt{7}$
4.  $2\sqrt{15}$       5.  $7\sqrt{42}$       6.  $1.3\sqrt{21}$
7.  $2\sqrt{5}$       8.  $4\sqrt{2}$       9.  $5\sqrt{3}$
10.  $\frac{\sqrt{29}}{9}$       11.  $\frac{\sqrt{17}}{a}$       12.  $5\sqrt{10}$
13. a.  $28\sqrt{3}$  ft      b.  $576\sqrt{3}$  ft<sup>3</sup>

## 12.4b Practice

1. -4      2. 3      3. -6      4. 8
5.  $\frac{1}{5}$       6. -0.4      7.  $10\sqrt[3]{12}$       8. -11
9.  $-6\sqrt[3]{10}$       10. 25      11.  $-\sqrt[3]{80}$       12. -2
13. 4.3;  $\sqrt[3]{8}$  is equal to 2. Because 4.3 is to the right of 2 on a number line, 4.3 is greater than  $\sqrt[3]{8}$ .
14. 5; The nearest perfect cube greater than 81 is 125. Because  $\sqrt[3]{125} = 5$  is to the right of  $\sqrt[3]{81}$  on a number line, 5 is greater than  $\sqrt[3]{81}$ .
15.  $\sqrt[3]{-12}$ ; The nearest perfect cube less than -12 is -27. Because  $\sqrt[3]{-12}$  is to the right of  $\sqrt[3]{-27} = -3$ , and -3 is to the right of -4,  $\sqrt[3]{-12}$  is greater than -4.
16. 96 ft<sup>2</sup>      17. 49 in.<sup>2</sup>

## 12.5 Activity

1. a. about 127 ft



$$90^2 + 90^2 = c^2$$

$$16,200 = c^2$$

$$127 \approx c$$

*Sample answer:* Rounding to the nearest whole number is accurate to feet.

- b. no; To form a right triangle, it would need to be half the distance from home plate to second base, which is about 63.5 feet.

2. 114.4 ft

3. a. 17.2 ft; yes; It was used to find the hypotenuse of the triangle.  
b. 11.2 in.; yes; It was used to find the height of the trapezoid, which is a leg of the triangle.  
c. 17.2 cm; yes; It was used to find the other side length of the parallelogram.

4. a.  $\frac{\sqrt{3}}{4}s^2$       b. about 43.3 in.<sup>2</sup>

5-6. *Sample answers are given.*

5. If you know two side lengths of a right triangle, you can use the Pythagorean Theorem to find the other side length, such as the height of a building or the length of a wheelchair ramp.
6. *Answer should include, but is not limited to:* Make sure the triangle is a right triangle and that two of the side lengths are given.

## 12.5 Practice

1. 4.5      2. 7.8      3. 3.6      4. 10.0 ft
5. 24.5 ft      6. yes      7. no      8. 1.6 m

## Chapter 13

### Fair Game Review

1. 12.21      2. 20.658      3. 5.565
4. 8.42      5. 0.85      6. 3.814
7. a. \$12.38      b. \$7.20
8. 6.45 yards      9. 2.352      10. 0.1014
11. 6.0048      12. 9      13. 1.5
14. 2700      15. \$6.93      16. \$0.27

# Record and Practice Journal Answer Key

## 13.1 Activity

1. a.

Power	Repeated Multiplication Form	Value
$(-3)^1$	$(-3)$	$-3$
$(-3)^2$	$(-3) \cdot (-3)$	$9$
$(-3)^3$	$(-3) \cdot (-3) \cdot (-3)$	$-27$
$(-3)^4$	$(-3) \cdot (-3) \cdot (-3) \cdot (-3)$	$81$
$(-3)^5$	$(-3) \cdot (-3) \cdot (-3)$ $\cdot (-3) \cdot (-3)$	$-243$
$(-3)^6$	$(-3) \cdot (-3) \cdot (-3) \cdot (-3)$ $\cdot (-3) \cdot (-3)$	$729$
$(-3)^7$	$(-3) \cdot (-3) \cdot (-3) \cdot (-3)$ $\cdot (-3) \cdot (-3) \cdot (-3)$	$-2187$

b. To compute  $(-3)^n$ , use  $(-3)$  as a factor  $n$  times and multiply.

2. a.  $3^4$     b. \$81

3. a. 100,000,000,000,000,000,000,000 m

b. 1,000,000,000,000,000,000,000 m

c. 10,000,000,000,000,000 m

d. 10,000,000 m; ten million

e. 1,000,000 m; one million

f. 100,000 m; one hundred thousand

4. wives:  $7^1$ ; sacks:  $7^2$ ; cats:  $7^3$ ; kits:  $7^4$

5. Exponents can be used to represent repeated multiplication of the same factor. *Sample answer:* Exponents are used in astronomy to describe the distances between planets and stars and the size of these objects. Exponents are used when computing the areas and volumes of objects.

## 13.1 Practice

1.  $4^5$     2.  $\left(-\frac{1}{8}\right)^3$     3.  $5^2(-x)^4$     4.  $9^2y^6$

5. 1000    6. 2401    7.  $-\frac{1}{7776}$     8. 153

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

10.  $2^6$ ; 64 inches

## 13.2 Activity

1. a.

Product	Repeated Multiplication Form	Power
$2^2 \cdot 2^4$	$2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2$	$2^6$
$(-3)^2 \cdot (-3)^4$	$(-3) \cdot (-3) \cdot (-3)$ $\cdot (-3) \cdot (-3) \cdot (-3)$	$(-3)^6$
$7^3 \cdot 7^2$	$7 \cdot 7 \cdot 7 \cdot 7 \cdot 7$	$7^5$
$5.1^1 \cdot 5.1^6$	$(5.1) \cdot (5.1) \cdot (5.1) \cdot (5.1)$ $\cdot (5.1) \cdot (5.1) \cdot (5.1)$	$5.1^7$
$(-4)^2 \cdot (-4)^2$	$(-4) \cdot (-4)$ $\cdot (-4) \cdot (-4)$	$(-4)^4$
$10^3 \cdot 10^5$	$10 \cdot 10 \cdot 10 \cdot 10$ $\cdot 10 \cdot 10 \cdot 10 \cdot 10$	$10^8$
$\left(\frac{1}{2}\right)^5 \cdot \left(\frac{1}{2}\right)^5$	$\frac{1}{2} \cdot \frac{1}{2} \cdot \frac{1}{2} \cdot \frac{1}{2} \cdot \frac{1}{2}$ $\cdot \frac{1}{2} \cdot \frac{1}{2} \cdot \frac{1}{2} \cdot \frac{1}{2} \cdot \frac{1}{2}$	$\left(\frac{1}{2}\right)^{10}$

b. The number of factors is equal to the sum of the exponents.

$$a^m \cdot a^n = a^{m+n}$$

c.  $2^2 \cdot 2^4 = 2^{2+4} = 2^6$

$$(-3)^2 \cdot (-3)^4 = (-3)^{2+4} = (-3)^6$$

$$7^3 \cdot 7^2 = 7^{3+2} = 7^5$$

$$5.1^1 \cdot 5.1^6 = 5.1^{1+6} = 5.1^7$$

$$(-4)^2 \cdot (-4)^2 = (-4)^{2+2} = (-4)^4$$

$$10^3 \cdot 10^5 = 10^{3+5} = 10^8$$

$$\left(\frac{1}{2}\right)^5 \cdot \left(\frac{1}{2}\right)^5 = \left(\frac{1}{2}\right)^{10}$$

yes



# Record and Practice Journal Answer Key

2.  $2^6 = 64$ ;  $(-3)^6 = 729$ ;  $7^5 = 16,807$ ;

$5.1^7 \approx 89,741.1$ ;  $(-4)^4 = 256$ ;

$10^8 = 100,000,000$ ;  $\left(\frac{1}{2}\right)^{10} = \frac{1}{1024}$

3. a. 256 pennies    b. (1, 4), (2, 3), (3, 2), (4, 1)

c. \$655.36    d. 3932.16 in.

4. To multiply two powers with the same base, add their exponents.

Sample answer:

$$(-3)^4 \cdot (-3)^5 = (-3)^9; \left(\frac{1}{4}\right)^2 \cdot \left(\frac{1}{4}\right)^1 = \left(\frac{1}{4}\right)^3$$

## 13.2 Practice

1.  $(-6)^9$
2.  $x^{10}$
3.  $\left(\frac{4}{5}\right)^{15}$
4.  $(-1.5)^{22}$
5.  $y^{200}$
6.  $\left(-\frac{2}{9}\right)^{56}$
7.  $64a^6$
8.  $256b^4$
9.  $\frac{81}{100}p^2$
10.  $x^{15}y^{15}$
11. 0
12. 282,475,249
13. 6,156,360,000,000 square kilometers

## 13.3 Activity

1. a.

Quotient	Repeated Multiplication Form	Power
$\frac{2^4}{2^2}$	$\frac{\overset{1}{\cancel{2}} \cdot \overset{1}{\cancel{2}} \cdot 2 \cdot 2}{\underset{1}{\cancel{2}} \cdot \underset{1}{\cancel{2}}}$	$2^2$
$\frac{(-4)^5}{(-4)^2}$	$\frac{\overset{1}{\cancel{(-4)}} \cdot \overset{1}{\cancel{(-4)}} \cdot (-4) \cdot (-4) \cdot (-4)}{\underset{1}{\cancel{(-4)}} \cdot \underset{1}{\cancel{(-4)}}}$	$(-4)^3$
$\frac{7^7}{7^3}$	$\frac{\overset{1}{\cancel{7}} \cdot \overset{1}{\cancel{7}} \cdot \overset{1}{\cancel{7}} \cdot 7 \cdot 7 \cdot 7 \cdot 7}{\underset{1}{\cancel{7}} \cdot \underset{1}{\cancel{7}} \cdot \underset{1}{\cancel{7}}}$	$7^4$
$\frac{8.5^9}{8.5^6}$	$\frac{\overset{1}{\cancel{(8.5)}} \cdot \overset{1}{\cancel{(8.5)}} \cdot \overset{1}{\cancel{(8.5)}} \cdot (8.5) \cdot (8.5) \cdot (8.5)}{\underset{1}{\cancel{(8.5)}} \cdot \underset{1}{\cancel{(8.5)}} \cdot \underset{1}{\cancel{(8.5)}}} \cdot (8.5) \cdot (8.5) \cdot (8.5)$	$8.5^3$
$\frac{10^8}{10^5}$	$\frac{\overset{1}{\cancel{10}} \cdot \overset{1}{\cancel{10}} \cdot \overset{1}{\cancel{10}} \cdot \overset{1}{\cancel{10}} \cdot \overset{1}{\cancel{10}} \cdot 10 \cdot 10 \cdot 10}{\underset{1}{\cancel{10}} \cdot \underset{1}{\cancel{10}} \cdot \underset{1}{\cancel{10}} \cdot \underset{1}{\cancel{10}} \cdot \underset{1}{\cancel{10}}}$	$10^3$
$\frac{3^{12}}{3^4}$	$\frac{\overset{1}{\cancel{3}} \cdot \overset{1}{\cancel{3}} \cdot \overset{1}{\cancel{3}} \cdot \overset{1}{\cancel{3}} \cdot 3 \cdot 3 \cdot 3 \cdot 3 \cdot 3 \cdot 3 \cdot 3 \cdot 3}{\underset{1}{\cancel{3}} \cdot \underset{1}{\cancel{3}} \cdot \underset{1}{\cancel{3}} \cdot \underset{1}{\cancel{3}}}$	$3^8$
$\frac{(-5)^7}{(-5)^5}$	$\frac{\overset{1}{\cancel{(-5)}} \cdot \overset{1}{\cancel{(-5)}} \cdot \overset{1}{\cancel{(-5)}} \cdot \overset{1}{\cancel{(-5)}} \cdot \overset{1}{\cancel{(-5)}} \cdot (-5) \cdot (-5)}{\underset{1}{\cancel{(-5)}} \cdot \underset{1}{\cancel{(-5)}} \cdot \underset{1}{\cancel{(-5)}} \cdot \underset{1}{\cancel{(-5)}} \cdot \underset{1}{\cancel{(-5)}}}$	$(-5)^2$
$\frac{11^4}{11^1}$	$\frac{\overset{1}{\cancel{11}} \cdot 11 \cdot 11 \cdot 11}{\underset{1}{\cancel{11}}}$	$11^3$

# Record and Practice Journal Answer Key

- b. The power column is always the difference in the exponents (numerator to denominator) in the quotient column.

$$\frac{a^m}{a^n} = a^{m-n}$$

c.  $\frac{2^4}{2^2} = 2^{4-2} = 2^2$

$$\frac{(-4)^5}{(-4)^2} = (-4)^{5-2} = (-4)^3$$

$$\frac{7^7}{7^3} = 7^{7-3} = 7^4$$

$$\frac{8.5^9}{8.5^6} = 8.5^{9-6} = 8.5^3$$

$$\frac{10^8}{10^5} = 10^{8-5} = 10^3$$

$$\frac{3^{12}}{3^4} = 3^{12-4} = 3^8$$

$$\frac{(-5)^7}{(-5)^5} = (-5)^{7-5} = (-5)^2$$

$$\frac{11^4}{11^1} = 11^{4-1} = 11^3$$

yes

2.

	Volume of Smaller Cube	Volume of Larger Cube	Larger Volume Smaller Volume	Answer
a.	$4^3$	$(4^2)^3 = 4^6$	$\frac{4^6}{4^3}$	$4^3$
b.	$3^3$	$(3^2)^3 = 3^6$	$\frac{3^6}{3^3}$	$3^3$
c.	$6^3$	$(6^2)^3 = 6^6$	$\frac{6^6}{6^3}$	$6^3$
d.	$10^3$	$(10^2)^3 = 10^6$	$\frac{10^6}{10^3}$	$10^3$

3. To divide two powers that have the same base, subtract their exponents.

Sample answer:

$$\frac{2^7}{2^3} = 2^{7-3} = 2^4, \frac{9^{10}}{9^6} = 9^{10-6} = 9^4$$

## 13.3 Practice

1. 7      2.  $(-21)^6$       3.  $(8.6)^7$       4.  $(3.9)^{10}$

5.  $t^4$       6.  $d^{16}$       7.  $8^2$       8.  $(-1.1)^{14}$

9.  $m^{30}$       10.  $81k$       11.  $16x^4y^2$       12.  $a^9b^7$

13. 46.656

## 13.4 Activity

1. a. The exponents are decreasing by one each time.  
Because  $10^0$  appears in the ones place,  $10^0 = 1$ .

- b. 32; 16; 8; 4; 2; 1

The next one is half the previous one.

$$2^0 = \frac{1}{2}(2) = 1$$

- c.  $3^{5-2} = 3^3 = 27$ ;  $3^{4-2} = 3^2 = 9$ ;  
 $3^{3-2} = 3^1 = 3$ ;  $3^{2-2} = 3^0 = 1$

Each time the exponent in the numerator decreases by 1, the final answer is  $\frac{1}{3}$  the previous row.

$$3^0 = \frac{1}{3}(3) = 1$$

2. a. volume of cylinder divided by volume of cone; 3; The volume of the cylinder is 3 times the volume of the cone.

- b. volume of sphere divided by volume of cone; 2; The volume of the sphere is 2 times the volume of the cone.

- c. volume of cylinder divided by volume of sphere;  $\frac{3}{2}$ ; The volume of the cylinder is  $1\frac{1}{2}$  times the volume of the sphere.

3. Method 1 lists the factors and reduces the fraction. Method II uses the Quotient of Powers Property. You can write a power with a negative exponent as a fraction with 1 in the numerator and the power to the absolute value of the exponent in the denominator.

4. Any base to the zero power equals 1.

Negative exponents result when the exponent in the denominator is greater than the exponent in the numerator. When this is the case, the Quotient of Powers Property gives a negative exponent.

Sample answer:  $\frac{3^5}{3^5} = 3^{5-5} = 3^0 = 1$

$$\frac{2^3}{2^4} = 2^{3-4} = 2^{-1} = \frac{1}{2^1}$$

# Record and Practice Journal Answer Key

## 13.4 Practice

1. 1

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

3. 1

4.  $\frac{1}{10,000,000,000}$

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

6.  $\frac{1}{282.5761}$

7.  $\frac{19}{x^6}$

8.  $14a^3$

9.  $\frac{4}{y^6}$

10. 24

11.  $35k^7$

12.  $\frac{3}{4r^2s^3}$

13. about 44,300,000,000,000 grams per cubic centimeter

## 13.5 Activity

1.  $6.0E+18$  means a 6 followed by 18 zeros.

There aren't enough display places to show all the zeros.

2.  $6.0E-18$  means 17 zeros followed by a 6 all to the right of the decimal point.

3. a. 10,000,000 dust mites

b. 0.01 inch

c. *Sample answer:* 24 people, 24,000,000,000,000,000 bacteria

d. *Sample answer:* finger: 2 inches; 100,000 bacteria

e. 0.000000000000000025%

f. about 86,580,000,000,000,000,000 atoms per ounce

4. *Sample answer:*  $6 \times 10^6$  is read as "six times ten raised to the sixth"

It is called scientific notation because it is used frequently in the science fields. Scientific notation is important because it provides a convenient way to express numbers that are very large and very small.

## 13.5 Practice

1. No; the factor is greater than 10.

2. Yes; the factor is greater than 1 and less than 10.

3. Yes; the factor is greater than 1 and less than 10.

4. Yes; the factor is greater than 1 and less than 10.

5. No; the factor is less than 1.

6. Yes; the factor is greater than 1 and less than 10.

7. 4,000,000,000

8. 0.00002

9. 3,700,000

10. 0.00412

11. 76,200,000,000

12. 0.0000000000009908

13. a. 300,000,000    b. 1,500,000,000 meters

## 13.6 Activity

1. a. 2; acid    b. 8; base    c. 7; neutral

d. 11; base    e. 4; acid    f. 0; acid

2. a. Uranus;  $1.8 \times 10^9$  mi;  $9.504 \times 10^{12}$  ft;  $8.7 \times 10^{25}$  kg

b. Venus;  $6.7 \times 10^7$  mi;  $3.5376 \times 10^{11}$  ft;  $4.9 \times 10^{24}$  kg

c. Saturn;  $8.9 \times 10^8$  mi;  $4.6992 \times 10^{12}$  ft;  $5.7 \times 10^{26}$  kg

d. Earth;  $9.3 \times 10^7$  mi;  $4.9104 \times 10^{11}$  ft;  $6 \times 10^{24}$  kg

e. Mars;  $1.4 \times 10^8$  mi;  $7.392 \times 10^{11}$  ft;  $6.4 \times 10^{23}$  kg

f. Neptune;  $2.8 \times 10^9$  mi;  $1.4784 \times 10^{13}$  ft;  $1 \times 10^{26}$  kg

g. Jupiter;  $4.8 \times 10^8$  mi;  $2.5344 \times 10^{12}$  ft;  $1.9 \times 10^{27}$  kg

h. Mercury;  $3.6 \times 10^7$  mi;  $1.9008 \times 10^{11}$  ft;  $3.3 \times 10^{23}$  kg

3. *Sample answer:* Let 1 inch represent 100,000,000 miles. Then the distances from the Sun will be: Mercury: 0.36 in., Venus: 0.67 in., Earth: 0.93 in., Mars: 1.4 in., Jupiter: 4.8 in., Saturn: 8.9 in., Uranus: 18 in., and Neptune: 28 in.

Check scale drawings.

4. *Sample answer:* Move the decimal point left or right so the number is at least 1 but less than 10. Then multiply by ten raised to the number of times you moved the decimal. If you moved the decimal point to the left, the exponent will be positive. If you moved the decimal point to the right, the exponent should be negative.

## 13.6 Practice

1.  $4.2 \times 10^6$

2.  $3.8 \times 10^{-2}$

3.  $6 \times 10^5$

# Record and Practice Journal Answer Key

4.  $8.08 \times 10^{-5}$     5.  $7 \times 10^{-4}$     6.  $2.901 \times 10^{10}$

7.  $2.4 \times 10^{15}$     8.  $8.1 \times 10^{-5}$     9.  $3.5 \times 10^4$

10.  $2.8 \times 10^{-17}$     11. yes;  $7.5 \times 10^{-6}$

## 13.6b Practice

1.  $9.2 \times 10^4$     2.  $1.26 \times 10^{-1}$

3.  $2.4 \times 10^5$     4.  $7 \times 10^{-3}$

5.  $1.016 \times 10^9$     6.  $4.20027 \times 10^3$

7.  $8.5 \times 10^5$     8.  $1.59 \times 10^{-2}$

9.  $4.0 \times 10^1$     10.  $3 \times 10^{-1}$

11.  $4 \times 10^{-7}$     12.  $1.5 \times 10^{-5}$

13. about 23 times greater

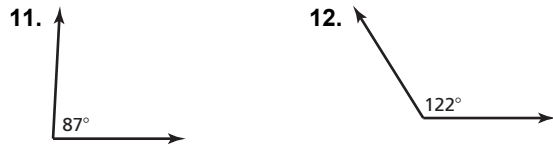
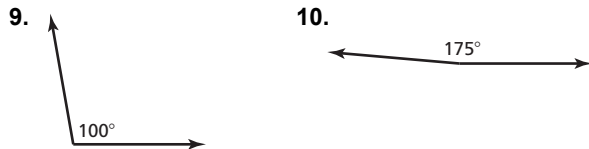
## Additional Topics

### Fair Game Review

1.  $60^\circ$ ; acute    2.  $90^\circ$ ; right

3.  $120^\circ$ ; obtuse    4.  $65^\circ$ ; acute

5.  $180^\circ$ ; straight    6.  $165^\circ$ ; obtuse



### Topic 1 Practice

1. neither    2. complementary

3. complementary    4. supplementary

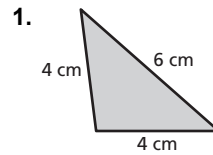
5. supplementary    6. neither

7. 50    8. adjacent; 52

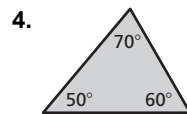
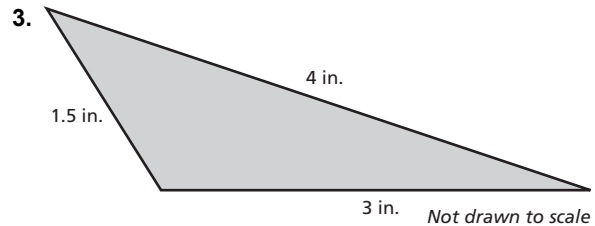
9. vertical; 126    10. vertical; 36    11. adjacent; 10

12.  $m\angle 1 = 128^\circ$ ;  $m\angle 2 = 52^\circ$ ;  $m\angle 3 = 128^\circ$

### Topic 2 Practice



2. not possible



5. not possible

6. triangle

7. rectangle

8. rectangle

### Topic 3 Practice

1. 9.84 ft    2. 12.6 in.    3. 15.2 L

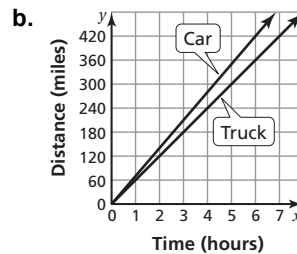
4.  $\frac{80 \text{ km}}{\text{h}}$     5.  $\frac{1.67 \text{ qt}}{\text{sec}}$     6.  $\frac{60 \text{ km}}{\text{min}}$

7.  $0.14 \text{ ft}^2$     8.  $5.56 \text{ yd}^2$

9.  $50,000,000 \text{ cm}^3$     10. about 0.043 ounce

### Topic 4 Practice

1. a. car

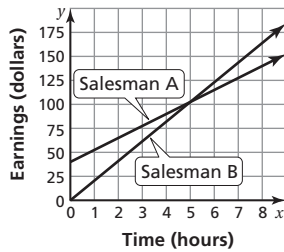


The graph that represents the car is steeper than the graph that represents the truck. So, the car is faster.

# Record and Practice Journal Answer Key

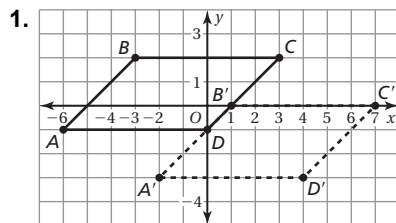
2. a. Salesman B

b.  $y = 20.5x$ ;

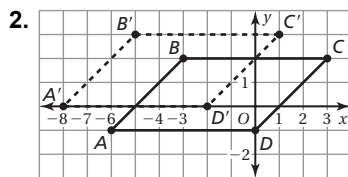


Salesman B has a higher hourly wage, but does not earn more money than Salesman A until each person has worked more than 5 hours.

## Topic 5 Practice



$A'(-2, -3), B'(1, 0), C'(7, 0), D'(4, -3)$



$A'(-8, 0), B'(-5, 3), C'(1, 3), D'(-2, 0)$

3. a.  $W'(-6, -1), X'(-6, -4), Y'(-2, -4), Z'(-2, -1)$

b.  $W'(6, 1), X'(6, 4), Y'(2, 4), Z'(2, 1)$

4. a.  $P'(4, 6), Q'(4, 1), R'(9, 6)$

b.  $P'(-4, -6), Q'(-4, -1), R'(-9, -6)$

5.  $L'(3, -1), M'(3, -4), N'(1, -1)$

6.  $L'(-1, -3), M'(-4, -3), N'(-1, -1)$

7.  $F'(-12, -2), G'(-8, 2), H'(-4, -2), J'(-8, -10)$ ;  
enlargement

8.  $F'\left(-3, -\frac{1}{2}\right), G'\left(-2, \frac{1}{2}\right), H'\left(-1, -\frac{1}{2}\right), J'\left(-2, -\frac{5}{2}\right)$ ;  
reduction

## Topic 6 Practice

1.  $523.6 \text{ mm}^3$

2.  $1436.8 \text{ cm}^3$

3.  $371.6 \text{ in.}^3$

4.  $56.5 \text{ m}^3$

5.  $12,214.5 \text{ yd}^3$

6.  $3354.4 \text{ ft}^3$

7.  $576 \text{ in.}^3$

8.  $141 \text{ cm}^3$

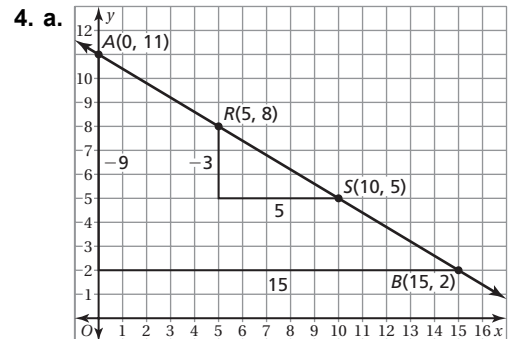
## Topic 7 Practice

1. yes; Corresponding leg lengths are proportional.

2. no; Corresponding leg lengths are not proportional.

3. a. Triangle  $ABC$ : 1; Triangle  $DEF$ : 1

b. The slope of the line is 1.



b.  $-\frac{3}{5}$

c.  $-\frac{3}{5}$ ; Sample answer:

