

Student Journal Answers

Chapter 1

Review & Refresh

- $7 + y$;
 $2 + (5 + y) = (2 + 5) + y$ Assoc. Prop. of Add.
 $= 7 + y$ Add 2 and 5.
- $c + 10$;
 $(c + 1) + 9 = c + (1 + 9)$ Assoc. Prop. of Add.
 $= c + 10$ Add 1 and 9.
- $n + 3.7$;
 $(2.3 + n) + 1.4 = (n + 2.3) + 1.4$ Comm. Prop. of Add.
 $= n + (2.3 + 1.4)$ Assoc. Prop. of Add.
 $= n + 3.7$ Add 2.3 and 1.4.
- $12 + d$;
 $7 + (d + 5) = 7 + (5 + d)$ Comm. Prop. of Add.
 $= (7 + 5) + d$ Assoc. Prop. of Add.
 $= 12 + d$ Add 7 and 5.
- $t + 3$;
 $(t + 3) + 0 = t + (3 + 0)$ Assoc. Prop. of Add.
 $= t + 3$ Add. Prop. of Zero
- $4 + g$;
 $0 + (g + 4) = 0 + (4 + g)$ Comm. Prop. of Add.
 $= (0 + 4) + g$ Assoc. Prop. of Add.
 $= 4 + g$ Add. Prop. of Zero
- $\frac{17}{72}$
- $\frac{47}{30}$
- $\frac{1}{3}$
- $\frac{2}{35}$
- $7\frac{1}{12}$ cups

1.1 Exploration

Exploration 1

- Sample answer:* 3 units; the absolute value
- Answers will vary. The number to the right on the number line is greater.
- Answers will vary.

1.1 Practice

- =
- <
- <
- a. 15, -6 b. 15, |-6|

- |-34|, |0|, 14, |-25|, 28
- 16, 10, |-16|, |25|, |-43|
- a. Phosphorus; 280 is the largest positive number, thus it is the highest boiling point.
 b. Oxygen; |-183| < 184; 183 < 184
- a. up b. 13 ft/sec
 c. down d. 17 ft/sec
- 0
- true; Both numbers have an absolute value of 3.
- false; *Sample number:* Let $x = -4$. Then $|x| = 4$ and 4 is not less than -4.

1.2 Exploration

Exploration 1

- Sample answer:* Use integer counters to represent each number; Use the same number of positive and negative counters.
- $-3 + 2$; -1
-

Expression	Type of Sum	Sum	Sum: Positive, Negative, or Zero
$-3 + 2$	Integers with different signs	-1	Negative
$-4 + (-3)$	Integers with the same sign	-7	Negative
$5 + (-3)$	Integers with different signs	2	Positive
$7 + (-7)$	Integers with different signs	0	Zero
$2 + 4$	Integers with the same sign	6	Positive
$-6 + (-2)$	Integers with the same sign	-8	Negative
$-5 + 9$	Integers with different signs	4	Positive
$15 + (-9)$	Integers with different signs	6	Positive
$-10 + 10$	Integers with different signs	0	Zero
$-6 + (-6)$	Integers with the same sign	-12	Negative
$13 + (-13)$	Integers with different signs	0	Zero

- d. The sum will have the same sign as the integer with the greater absolute value, unless they are opposites. If they are opposites, the sum is zero.
- e. *Sample answer:* (i) Add the absolute values of the integers and make the sum the same sign as the addends; (ii) Subtract the absolute values and use the sign of the integer with the greater absolute value; (iii) The sum is zero.

1.2 Practice

- 5
- Use the Commutative Property to switch the positions of the terms -25 and -18 . Then use the Associative Property to group the terms 18 and -18 . Because they are opposites, their sum will be zero; -25
- Use the Commutative Property to switch the positions of the terms 45 and -8 . Then use the Associative Property to group the terms -22 and -8 ; 15
- Use the Commutative Property to switch the positions of the terms -12 and 4 . Then use the Associative Property to group the terms 28 and 4 ; 20
- 18
- 14
- -59
- The sum is 5 units to the right of p .
- The sum is 2 units to the left of p .
- The sum is $|q|$ units to the right of p if $q < 0$. The sum is q units to the left of p if $q > 0$. The sum is at p if $q = 0$.
- $n = 25$
- $c = 71$
- $k = -80$
- Sample answer:* $-30, 8, 2$;
Sample answer: $8, 7, -5$
- -10°F

16. *Sample answer:*

9	-6	3
-1	0	1
-8	6	2

- $p = 0, q = 0$; Both absolute values will be positive or zero. The sum of two absolute values is zero when both numbers equal zero.
 - no possible values; To get a negative sum, at least one term must be negative and the absolute value of a number cannot be negative.

- all values except when both p and q equal zero. The sum of two positive numbers is greater than zero. The sum of a positive number and zero is greater than zero.

1.3 Exploration

Exploration 1

a. *Sample answer:*

$$\frac{1}{7}; \frac{1}{7} + \frac{3}{7}; -\frac{2}{7} + \left(-\frac{3}{7}\right); -\frac{4}{7} + \frac{5}{7}; \frac{4}{7} + \left(-\frac{5}{7}\right);$$

$$\frac{4}{7}; -\frac{5}{7}; \frac{1}{7}; -\frac{1}{7}$$

- yes; *Sample answer:* Use absolute values and a number line to add any numbers.
- yes; *Sample answer:* Rational numbers are added the same way integers are added, so the properties would still apply.

1.3 Practice

$$1. 2\frac{5}{6} + \left(-\frac{8}{15}\right) = \frac{17}{6} + \left(-\frac{8}{15}\right)$$

$$= \frac{85 + (-16)}{30}$$

$$= \frac{69}{30} = 2\frac{9}{30} = 2\frac{3}{10}$$

$$2. -\frac{19}{20}$$

$$3. -\frac{1}{20}$$

$$4. \frac{11}{20}$$

$$5. \$8.44$$

$$6. \frac{8}{21}$$

$$7. -5\frac{11}{20}$$

$$8. -3\frac{7}{9}$$

$$9. 20$$

- when the absolute value of the positive number is greater than the absolute value of the negative number
- greater than; The sum of the 3 months of difference is positive.
- $-\$2.35$
- when the decimal portions have a sum of 1

1.4 Exploration

Exploration 1

- 2; 2; The answers are the same.
- Place 3 negative counters in the box and then place a zero pair in the box. Remove the positive counter of the zero pair and the result is the sum.

Exercise	Operation: Add or Subtract	Answer
$4 - 2$	Subtract 2.	2
$4 + (-2)$	Add -2 .	2
$-3 - 1$	Subtract 1.	-4
$-3 + (-1)$	Add -1 .	-4
$3 - 8$	Subtract 8.	-5
$3 + (-8)$	Add -8 .	-5
$9 - 13$	Subtract 13.	-4
$9 + (-13)$	Add -13 .	-4
$-6 - (-3)$	Subtract -3 .	-3
$-6 + 3$	Add 3.	-3
$-5 - (-12)$	Subtract -12 .	7
$-5 + 12$	Add 12.	7

- d. *Sample answer:* When subtracting two integers, add the opposite of the subtracted integer.

1.4 Practice

- 36 ft; $8 - (-28)$
- 13
- -44
- 206
- Sample answer:* Write the subtraction as addition. Use the Commutative Property to switch the last two terms. Then use the Associative Property to add $-(-22)$ and -22 first; 17
- Sample answer:* Use the Commutative Property to switch the first two terms. Then use the Associative Property to add -15 and 15 first; -31
- Sample answer:* Write the subtraction as addition. Use the Associative Property to add 19 and (-19) first; -24
- a. 94°F , 103°F , 114°F , 107°F , 84°F , 76°F , 64°F , 65°F , 75°F , 86°F , 105°F , 98°F
b. 99°F , -46°F
c. 145
- 23
- 7
- -53
- when $|b| > |a|$ or a and b have different signs
- Sample answer:* -6 , -12 ; -1 , -7
- The difference is 3 units to the left of p .
- The difference is 5 units to the right of p .

16. The difference is q units to the right of p if $q < 0$. The difference is q units to the left of p if $q > 0$. The sum is at p if $q = 0$.

17. a. *Sample answer:* 10, 12, -2 ; 5, 6, -1

- b. *Sample answer:* 10, 2, 9; 16, 1, 2

1.5 Exploration

Exploration 1

- Sample answer:* $\frac{1}{7}; \frac{2}{7} - \frac{5}{7}; -\frac{4}{7} - \left(-\frac{1}{7}\right); -\frac{3}{7}; -\frac{3}{7}$
- yes; *Sample answer:* Use absolute values and a number line to subtract any numbers.
- Sample answer:* yes; Rewrite the subtraction as addition first, then apply the properties.

Exploration 2

- 5
- Find the value of $|3 - (-2)|$; $|3 - (-2)| = 5$
- Sample answer:* $\left|-\frac{1}{5} - \frac{3}{5}\right| = \left|-\frac{1}{5} + \left(-\frac{3}{5}\right)\right| = \left|-\frac{4}{5}\right| = \frac{4}{5}$

1.5 Practice

- $2\frac{8}{15}$
- 13.7
- 1.7
- $7\frac{13}{16} - 9\frac{5}{8} = -1\frac{13}{16}$
- $-5\frac{5}{6}$
- -24.625
- 3.975
- $-1\frac{2}{9}$
- $-\$90.73$
- $1\frac{6}{8}$
- when the fractional parts are equal
- a. 0; The points lie on a vertical line.
b. $\frac{1}{2}$
c. $\frac{2}{3} - 1\frac{1}{6}$
d. $1\frac{1}{6} - \frac{2}{3}$
e. part (c)

Chapter 2

Review & Refresh

- $70t$
 $10(7t) = (10 \cdot 7)t$ Assoc. Prop. of Mult.
 $= 70t$ Multiply 10 and 7.
- $32k$
 $8(4k) = (8 \cdot 4)k$ Assoc. Prop. of Mult.
 $= 32k$ Multiply 8 and 4.

3. 0;

$$13 \cdot 0 \cdot p = (13 \cdot 0) \cdot p \quad \text{Assoc. Prop. of Mult.}$$

$$= 0 \cdot p = 0 \quad \text{Mult. Prop. of Zero}$$

4. 0;

$$7 \cdot z \cdot 0 = 7 \cdot 0 \cdot z \quad \text{Comm. Prop. of Mult.}$$

$$= (7 \cdot 0) \cdot z \quad \text{Assoc. Prop. of Mult.}$$

$$= 0 \cdot z = 0 \quad \text{Mult. Prop. of Zero}$$

5. $2.5w$;

$$2.5 \cdot w \cdot 1 = 2.5 \cdot (w \cdot 1) \quad \text{Assoc. Prop. of Mult.}$$

$$= 2.5 \cdot w \quad \text{Mult. Prop. of One}$$

$$= 2.5w$$

6. $19x$;

$$1 \cdot x \cdot 19 = 1 \cdot 19 \cdot x \quad \text{Comm. Prop. of Mult.}$$

$$= (1 \cdot 19) \cdot x \quad \text{Assoc. Prop. of Mult.}$$

$$= 19x \quad \text{Mult. Prop. of One}$$

7. $\frac{13}{50}$

8. $\frac{79}{100}$

9. 0.4

10. 0.85

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

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

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

14. $\frac{26}{3}$

15. $-\frac{65}{6}$

16. $\frac{5}{27}$

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

18. $\frac{14}{11}$

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

2.1 Exploration

Exploration 1

- Sample answer:* Use three groups of two negative counters
- -6 ; 6 ; *Sample answer:* Subtract 2 from each row in the first table. Subtract -3 from each row in the second table.

c.

Expression	Type of Product	Product	Product: Positive or Negative
$3 \cdot 2$	Integers with the same sign	6	Positive
$3 \cdot (-2)$	Integers with opposite signs	-6	Negative
$-3 \cdot 2$	Integers with opposite signs	-6	Negative
$-3 \cdot (-2)$	Integers with the same sign	6	Positive
$6 \cdot 3$	Integers with the same sign	18	Positive
$2 \cdot (-5)$	Integers with opposite signs	-10	Negative
$-6 \cdot 5$	Integers with opposite signs	-30	Negative
$-5 \cdot (-3)$	Integers with the same sign	15	Positive

- Multiply the absolute values and make the product positive.
- Multiply the absolute values and make the product negative.

2.1 Practice

- -384
- -144
- -72
- 0
- 18
- -19
- 24
- $\$325$
 - yes; 9th member; *Sample answer:* The 8th member ($n = 7$) pays $550 + (-75 \cdot 7) = \$25$. The 9th member ($n = 8$) pays $550 + (-75 \cdot 8) = -\$50$, which is a negative amount. So, the 9th member is free.
 - $\$25$; 8th member; *Sample answer:* The lowest amount that a member would pay is $550 + (-75 \cdot 7) = \$25$.
- 47
 - yes; $-3, 16$
 - 49
- true; The product of two negative integers is positive. The product of the positive result and a negative integer is negative.
- false; There are two groups of two negative integers, whose products are positive. The product of two positive integers is positive.

12. false; The product of two negative integers is positive. The product of the positive result and a positive integer is positive.
13. true; The product of two positive integers is positive. The product of the positive result and a negative integer is negative.
14. true; The product of each pair of negative integers is positive. The product of the positive results is positive. Then the product of the positive result and the remaining negative integer is negative.

2.2 Exploration

Exploration 1

- a. They are inverse operations.
- b.

Expression	Type of Quotient	Quotient	Quotient: Positive, Negative, or Zero
$-15 \div 3$	Integers with different signs	-5	Negative
$12 \div (-6)$	Integers with different signs	-2	Negative
$10 \div (-2)$	Integers with different signs	-5	Negative
$-6 \div 2$	Integers with different signs	-3	Negative
$-12 \div (-12)$	Integers with the same sign	1	Positive
$-21 \div (-7)$	Integers with the same sign	3	Positive
$0 \div (-15)$	Dividend is zero	0	Zero
$0 \div 4$	Dividend is zero	0	Zero
$-5 \div 4$	Integers with different signs	$-1\frac{1}{4}$	Negative
$5 \div (-4)$	Integers with different signs	$-1\frac{1}{4}$	Negative

- i. Divide the absolute values and make the quotient positive.
- ii. Divide the absolute values and make the quotient negative.
- c. -2 ; -2 ; -2 ; They are the same; yes, when $b \neq 0$; The quotients have the same value and the same sign.
- d. yes, when the divisor is nonzero; The quotient can be written as a fraction.

2.2 Practice

- | | |
|----------|--------------|
| 1. 16 | 2. 0 |
| 3. 1 | 4. undefined |
| 5. -12 | 6. -9 |
| 7. -52 | 8. -11 |
| 9. 3 | 10. 2 |
| 11. 28 | 12. 50 |
| 13. 12 | |
| 14. a. 2 | b. 2 |

c. *Sample answer:* PI-Squared, because they correctly answered both parts of more questions.

- | | |
|-----------------------|-------------|
| 15. a. 7 hours | b. 35 hours |
| c. 8 hours 10 minutes | |

16. 9, -3 ; Divide the previous number by -3 to obtain the next number.

2.3 Exploration

Exploration 1

a. $\frac{7}{10}$; $1\frac{29}{100}$; $12\frac{831}{1000}$; $\frac{41}{10,000}$

b. *Sample answer:* The factors (other than 1) are multiples of 2 and 5; yes

Exploration 2

a. 0.5; 0.333333...; 0.25; 0.2; 0.166666...; 0.142857...; 0.125; 0.111111...; 0.1; 0.090909...; 0.083333...; *Sample answer:* yes; Some decimals terminate and some repeat.

b. *Sample answer:* In Exploration 1, all the denominators are powers of 10. In part (a), the denominators are integers from 2 to 12.; When the denominator has factors that do not divide a power of 10, the decimal repeats.

c. yes; *Sample answer:* If the quotient of integers does not terminate, then the digits eventually repeat.

2.3 Practice

- | | |
|----------------------|-------------------------|
| 1. -5.075 | 2. $-0.\overline{136}$ |
| 3. $4.0\overline{6}$ | 4. $-9.\overline{1}$ |
| 5. $\frac{17}{25}$ | 6. $8\frac{149}{200}$ |
| 7. $-9\frac{49}{50}$ | 8. $-10\frac{113}{250}$ |
| 9. your friend | 10. > |
| 11. > | 12. < |

13. *Sample answer:* $-1.75, -1.\bar{6}$

14. a. $-2\frac{6}{7}, -\frac{3}{2}, 2.25, 2\frac{1}{3}$

b. 10:00 A.M. and 4:00 P.M.

c. $-2\frac{6}{7}$ ft d. decrease

e. increase; The tide increased at 4:00 A.M. on the given day, so it will increase again in the morning.

15. a. when $|a| < |b|$, a and b have different signs, and b is not a factor of the power of 10

b. when $|a| < |b|$, a and b have different signs, and b is a factor of the power of 10

c. not possible

2.4 Exploration

Exploration 1

a. *Sample answer:* $0.2 \cdot 0.9; 0.3 \cdot 0.5; 0.18; 0.15$

b. i. $0.18; -0.18$ ii. $0.15; -0.15$

iii. $\frac{1}{8}; -\frac{1}{8}$ iv. $0.48; 0.48$

v. $\frac{3}{25}; \frac{3}{25}$ vi. $1.08; -1.08$

vii. $3\frac{1}{8}; 3\frac{1}{8}$

c. yes; *Sample answer:* $-a$ is the opposite of a for any number.

2.4 Practice

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

2. $-11\frac{14}{25}$

3. 2.5654

4. \$17.55

5. *Sample answer:* $-\frac{2}{3}, \frac{2}{3}$

6. 0.241

7. $-11\frac{9}{25}$

8. a. \$46.25

b. no; $10\% \times 17\frac{3}{5} = 0.10 \times 17.6 = 1.76$; With a 10% increase, your car should average $17\frac{3}{5} + 1.76 = 17.6 + 1.76 = 19.36$ miles per gallon, which is greater than $19\frac{1}{5}$, or 19.2 miles per gallon.

9. *Sample answer:* $\frac{-3}{4} \times \frac{-2}{3} \times \left(-\frac{1}{3}\right) = \frac{1}{2} \times \left(-\frac{1}{3}\right) = -\frac{1}{6}$

10. about 20.119 min

11. $12.5 \times (-3.70) = -46.25$

2.5 Exploration

Exploration 1

a. *Sample answer:* $0.9 \div 0.6; 0.9 \div 1.5; 1.5; 0.6$

b. i. $0.6; -0.6$ ii. $2; -2$

iii. $8; -8$ iv. $0; 0$

v. $\frac{1}{2}; \frac{1}{2}$ vi. $8; 8$

c. yes; *Sample answer:* $-a$ is the opposite of a for any number.

d. *Sample answer:* Stock values dropped \$0.75 in 3 days. The stock values fell \$0.25 per day.

2.5 Practice

1. $-\frac{11}{180}$

2. $-\frac{21}{80}$

3. -6.3

4. 16 burgers

5. a. -0.52 second

b. 0.5 second

c. slower; There was an increase of time, so it took longer for the trial.

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

7. 0.7

8. $\frac{34}{13}$

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

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

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

12. a. \$72.52

b. 25% increase

Chapter 3

Review & Refresh

1. 6

2. 12

3. 20

4. $\frac{19}{4}$ or $4\frac{3}{4}$

5. 12

6. -1

7. 24 ft^2

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

9. $\frac{3}{2}$ or $1\frac{1}{2}$

10. -9

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

12. $\frac{11}{25}$

13. $-\frac{85}{24}$ or $-3\frac{13}{24}$

14. -2.7

15. 11.9

3.1 Exploration

Exploration 1

a. *Sample answer:* $x = 0, 1, -1$

A. 2; 3; 1 F. 4; 5; 3

B. 2; 1; 3 G. 2; 0; 4

C. 6; 8; 4 H. 2; 3; 1

D. 4; 5; 3 I. 2; 1; 3

E. 2; 0; 4 J. 6; 8; 4

Sample answer: these expressions are equal:
A and H, B and I, C and J, D and F, E and G

b. *Sample answer:* Use the Commutative and Associative Properties of Addition to move and group terms to simplify the expressions.

c. yes; *Sample answer:* Algebraic terms represent a number, so to subtract an algebraic term, you can add the opposite of that term.

3.1 Practice

1. Terms: $1.3x, -2.7x^2, -5.4x, 3$; Like terms: $1.3x$ and $-5.4x$

2. Terms: $10, -\frac{3}{10}m, 6m^2, \frac{2}{5}m$; Like terms: $-\frac{3}{10}m$ and $\frac{2}{5}m$

3. $-\frac{35}{12}b$

4. $-12y + 12$

5. $29x + 9$

6. $2.5x + 5$

7. $15.65x$

8. $-5; -5$; *Sample answer:* Simplifying the expression first is easier because you only have to substitute once instead of three times.

9. *Sample answer:* $4x + 5x + 5x^2 - 9x^2 + 5 - 20 + y$
 $4x + 5x + 5x^2 - 9x^2 + 5 - 20 + y$
 $= (4x + 5x) + [5x^2 + (-9x^2)] + [5 + (-20)] + y$
 $= 9x + (-4x^2) + (-15) + y$
 $= 9x - 4x^2 - 15 + y$

10. $x = 0$; The two expressions differ by only one term: $3x$. Thus, they will be equivalent when $3x = 0$, or $x = 0$.

3.2 Exploration

Exploration 1

a. *Sample answer:* By having the same number of positive and negative variable tiles and the same number of positive and negative number tiles, the sum of these values would equal 0.

b. $(x + 5) + (2x - 3) = 3x + 2$

$$(2x - 8) + (-3x + 5) = -x - 3$$

$$(x - 4) - (x - 3) = -1$$

$$(-2x + 5) - (x - 1) = -3x + 6$$

c. *Sample answer:* Expression 1: $3x + 5$

Expression 2: $11x - 9$

Sum: $14x - 4$

Difference: $-8x + 14$

Exploration 2

a. yes; *Sample answer:* $2x + (-2x) = 0$,
 $-3y + [-(-3y)] = -3y + 3y = 0$,

$$3z - 1 + [-(3z - 1)] = 3z - 1 + (-3z) + 1 = 0$$

b. *Sample answer:* By using the Commutative and Associative Properties, you can combine like terms to simplify the algebraic expression.

3.2 Practice

1. $1.8t + 7$

2. $\frac{25}{12}k + 6$

3. $-3.7s + 5r + 5$

4. $-\frac{1}{6}p + 3q - 0.7$

5. a. $7d + 12$ items

b. 5 more pairs of socks than toothbrushes

6. $17.2k - 10.5$

7. $\frac{4}{3}g - 4\frac{3}{5} = \frac{4}{3}g - \frac{23}{5}$

8. $\frac{2}{7}x - \frac{1}{5}y - \frac{11}{2}$

9. $0.9z - 1.7w + 2$

10. a. $2n - 9$

b. 8 units, 7 units, 1 unit

c. 12 units, 13 units, 5 units

11. a. *Sample answer:* $a = 4, b = 1, c = 2, d = -3$;
 $(4x + 1) - (2x - 3) = 2x + 4$

b. *Sample answer:* $a = 6, b = -2, c = 6, d = 3$;
 $(6x - 2) - (6x + 3) = -5$

3.3 Exploration

Exploration 1

a. *Sample answer:* $5(16 - z) - 5z$;

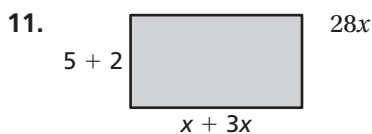
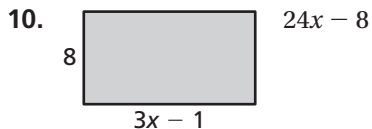
$$\frac{3}{4}(4x + 1) - \frac{3}{4}(x) - \frac{3}{4}(2x);$$

$$3.5y(y + 1.5y + 2y + 1) - 3.5y(y) - y(2y + 1) - y(2y + 1)$$

b. Answers will vary. The area of the shaded region can be found by either subtracting the areas of the nonshaded regions from the total area of the figure or by finding the dimensions of the shaded region. Expressions will be either unsimplified or simplified.

3.3 Practice

- $180m - 40$
- $31.4 - 14x$
- $\frac{17}{15}x + \frac{79}{5}$
- $13.6g - 22$
- $-5w - \frac{5}{2}$
- $4k - \frac{13}{5}$
- $4.5b + 24$
- $2j - 8$
- $(3t + 2) + (2t + 5) = 5t + 7$
 - $5(3t + 2) + 7(2t + 5) = 29t + 45$
 - \$132



- $6w + 20$
- C; *Sample answer:* All other expressions simplify to $10x - 35$.
- Let x represent the original number.
 - $x - 5$
 - $2(x - 5) = 2x - 10$
 - $(2x - 10) + 10 = 2x$
 - $\frac{2x}{4} = \frac{1}{2}x$

Your friend multiplied your resulting number by 2.

3.4 Exploration

Exploration 1

- Sample answer:* $\frac{4}{5}(1 + 2)$; $\frac{1}{2}(3x + 1)$; $2.5(x + 1.5y)$;
Factor out the same number from the area of each smaller rectangle. That number is the width of the smaller rectangles. The remaining factors of each area will be the lengths of the smaller rectangles.
- yes; *Sample answer:* The Distributive Property can be used to show that the expressions are equivalent.
- Sample answer:* Write each term as a product of factors and then you can factor out any rational number.

3.4 Practice

- $3(7s + 5)$
- $8(4v + 3w)$
- $6(2y - 7z)$
- $1.2(k + 2)$

$$5. 3\left(f + \frac{5}{3}\right)$$

$$6. \frac{3}{10}(x - 2)$$

$$7. -\frac{1}{3}(x + 36)$$

$$8. -\frac{1}{6}(2x - 5y)$$

$$9. (3x - 2) \text{ in.}$$

- $6x + 9$
 - $21x + 28$
 - $(21x + 28) - (6x + 69) = 15x + 19$

- $\frac{1}{2}\left(\frac{1}{3}\right)\left(\frac{1}{2}x + \frac{7}{5}\right)$
 - $\frac{1}{2}\left(\frac{1}{30}\right)(5x + 14)$

Chapter 4

Review & Refresh

- $8 + y$
- $p - 6$
- $7m$
- $11c - 8$
- $r - \frac{r}{2}$
- $9(z + 4)$
- $>$
- $>$
- $>$
- $<$
- $<$
- $<$
- your friend; 5.6 ft is about 5 ft and 7 in.

4.1 Exploration

Exploration 1

- Sample answer:* Adding or subtracting the same number on both sides of the equation produces equivalent expressions; yes; Adding or subtracting any value on both sides of an equation produces equivalent expressions.
- $x - 3 = -4$; *Sample answer:* Add three +1 tiles to each side; $x = -1$
 $-5 = x + 2$; Add two -1 tiles to each side; $x = -7$
 $x - 3 = 3$; Add three +1 tiles to each side; $x = 6$
 $5 = x - 2$; Add two +1 tiles to each side; $x = 7$
- Use the Addition and Subtraction Properties of Equality.

4.1 Practice

- $m = -6.4$
- $r = -1\frac{1}{2}$
- $b = 4.994$
- $d = -9\frac{11}{24}$
- $f = 6\frac{11}{15}$
- $c = -1.798$
- $27 = x + 12$; 15
- $p - (-9) = 12$; 3
- $m - 35 = -72$; -37
- $28.12 = f - 0.14$; 28.26 seconds
- $7\frac{3}{8} + \ell = 16\frac{1}{4}$; $8\frac{7}{8}$ meters
- $x - 140.8 = -70.2$; 70.6°F

13. \$53.30 14. 14.8, -14.8
 15. 10, -14 16. -7
 17. -2, -6

4.2 Exploration

Exploration 1

- a. *Sample answer:* Multiplying or dividing by the same number on both sides of the equation produces equivalent expressions; yes; Multiplying or dividing by any nonzero value on both sides of the equation produces equivalent expressions.
 b. $8 = 4x$; Divide the eight +1 tiles into 4 equal groups; $x = 2$
 $6x = -12$; Divide the twelve -1 tiles into 6 equal groups; $x = -2$
 $-3x = -9$; Divide the nine -1 tiles into 3 equal groups, then add a + variable and three +1 tiles to each side; $x = 3$
 c. Use the Multiplication and Division Properties of Equality.

4.2 Practice

1. $p = 1.5$ 2. $k = 7.5$
 3. $q = -2.35$ 4. $g = -0.0084$
 5. $c = 1\frac{1}{8}$ 6. $h = -33$
 7. $12t = 0.78$; $t = 0.065$, or 6.5%
 8. $72 = \frac{8}{9}p$; $p = 81$; $81 - 72 = 9$ points
 9. *Sample answer:* $3n = -44.4$
 10. *Sample answer:* $\frac{m}{9} = -\frac{1}{14}$
 11. $x \div \frac{1}{2} = 10$; 5 12. $x \cdot (-12) = -8$; $\frac{2}{3}$
 13. $\frac{9.75}{x} = -6.5$; -1.5
 14. There are 5 students in each group and 2 students are not in a group.
 15. a. $1.75y = 15.75$; 9 tokens
 b. $12t = 17.50$; about \$1.46
 c. $35 = 1.40t$; 25 free tokens
 16. 6, -6

4.3 Exploration

Exploration 1

- a. $2x - 3 = -5$; $x = -1$
 b. *Sample answer:* The steps are similar.

- c. $2x + 2 = -6$, $x = -4$; $-13 = 3x - 4$, $-3 = x$;
 $-2x + 4 = -2$, $x = 3$
 d. Subtract b from both sides of the equation and divide both sides of the equation by a .

4.3 Practice

1. $z = 2.\bar{8}$ 2. $s = -1.32$
 3. $c = 2.708\bar{3}$ 4. $h = \frac{5}{48}$
 5. $f = 43$ 6. $u = \frac{13}{15}$
 7. $132.49 + 15s = 192.49$; 4 skateboards
 8. $f + 27(0.99) = 42.72$; \$15.99
 9. $m = -9.4$ 10. $a = 6\frac{1}{6}$
 11. $x = -2.25$ 12. 16 ft, 32 ft
 13. a. 56 seashells b. 297 seashells
 c. *Sample answer:* 50, 3

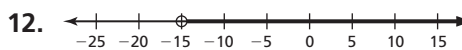
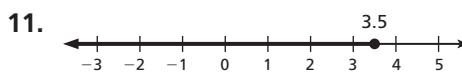
4.4 Exploration

Exploration 1

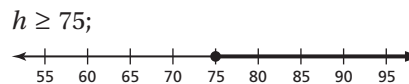
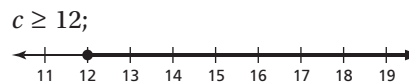
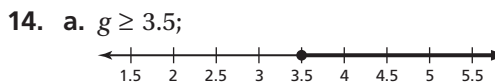
- a. *Sample answer:* any integer 3 or greater; any positive number less than 7.5; any number -1 or less; any number greater than $-8\frac{1}{2}$
 b. *Sample answer:* plot the points

4.4 Practice

1. $x > -4$; all values of x greater than -4
 2. $x \leq 11$; all values of x less than or equal to 11
 3. $x \geq 15$ 4. $r + 3.7 < 1.2$
 5. $\frac{h}{2} > -5$ 6. $a - 8.2 \leq 12$
 7. no 8. no 9. yes 10. no



13. $a \geq 16$



- b. no; Your cousin only has 65 hours of community service and needs at least 10 more hours to meet that requirement.

15. A number x is less than 3; The inequality is written as $x < 3$. The inequality for the other statements is written as $x \leq 3$.

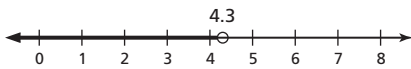
4.5 Exploration

Exploration 1

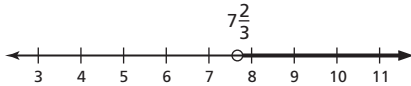
- a. yes; *Sample answer:* The relationship between the sides holds true.
- b. yes; *Sample answer:*
 $-2 < -1$
 $-2 + (-3) < -1 + (-3)$
 $-5 < -4$
- c. Subtract a from both sides of the inequality.

4.5 Practice

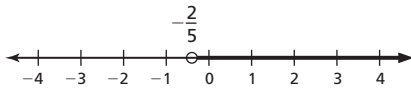
1. $w < 4.3$;



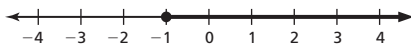
2. $v > 7\frac{2}{3}$;



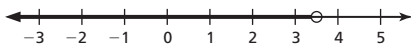
3. $k > -\frac{2}{5}$;



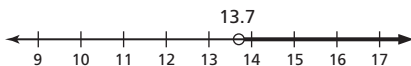
4. $q \geq -1$;



5. $c < 3.5$;



6. $p > 13.7$;



7. a. $7 + x \leq 18$; $x \leq 11$ lobsters
 b. $10 + x \leq 24$; $x \leq 14$ lobsters
 c. 6 lobsters
8. $x - 4 > 8$; $x > 12$ meters
9. $x + 35 \leq 50$; $x \leq 15$ inches
10. $c = 2$
11. all values of x greater than -5 and less than 5
12. The third side must be greater than 11 inches and less than 23 inches. Using the triangle inequality theorem, you can write and solve the inequalities $x + 6 > 17$ and $17 + 6 > x$.
13. 108; *Sample answer:* $x \geq 12$ and $9(12) = 108$.

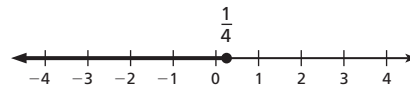
4.6 Exploration

Exploration 1

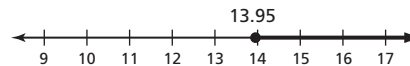
- a. sometimes; *Sample answer:* The inequality does not remain true when multiplying each side by a negative value.
- b. sometimes; *Sample answer:*
 $-4 < 5$ $-6 < 3$
 $\frac{-4}{2} < \frac{5}{2}$ $\frac{-6}{-2} < \frac{3}{-2}$
 $-2 < \frac{5}{2}$ $3 \nless \frac{-3}{2}$
- c. When $a > 0$, divide both sides by a . When $a < 0$, divide both sides by a and reverse the inequality symbol.

4.6 Practice

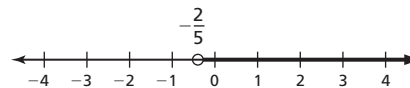
1. $y \leq \frac{1}{4}$



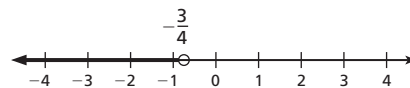
2. $s \geq 13.95$;



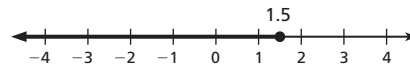
3. $x > -\frac{2}{5}$;



4. $d < -\frac{3}{4}$;



5. $r \leq 1.5$;



6. $j \geq 7.8$;



7. $\frac{n}{5} \geq 4$; $n \geq 20$ 8. $2n \leq -6$; $n \leq -3$

9. $c = \frac{1}{2}$

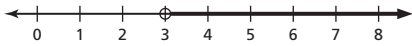
10. a. $\frac{2}{3}s \leq 10$; $s \leq 15$ shelves

- b. $\frac{5}{6}x \leq 10$; $x \leq 12$ shelves

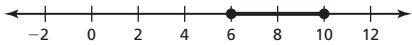
11. a. $x \geq 3$

- b. $8x \geq 24$

12. all values of x greater than 3;



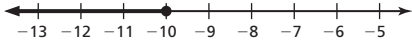
13. all values of t greater than or equal to 6 and less than or equal to 10;



14. all values of x greater than 1 and less than 4;



15. all values of y less than or equal to -10 ;



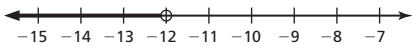
4.7 Exploration

Exploration 1

- $2x + 4 < -2$; $x < -3$
- $x < -3$; *Sample answer:* The steps are similar.
- $3x - 5 \geq -2$; $x \geq 1$
 $9 > 4x - 5$; $3\frac{1}{2} > x$
 $-2x - 6 \leq 2$; $x \geq -4$
- Sample answer:* Use inverse operations to isolate the variable.

4.7 Practice

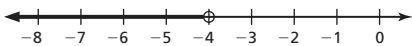
1. $q < -12$;



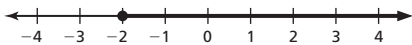
2. $v \geq -6$;



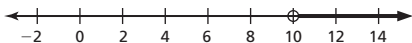
3. $m < -4$;



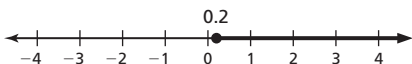
4. $f \geq -2$;



5. $p > 10$;



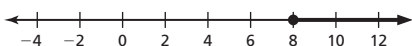
6. $w \geq 0.2$;



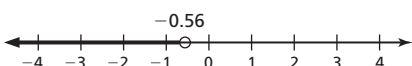
7. $300r + 2000 \geq 14,000$; $r \geq 40$; at least 40 occupied sites

8. $4.5(x + 3) \leq 45$; $x \leq 7$

9. $x \geq 8$;



10. $v < -0.56$;



11. a. $750 + 6x \geq 1170$; $x \geq 70$; at least 70 animals

- b. $750 + 6x \leq 900$; $x \leq 25$; at most 25 animals

- c. \$950

12. $r \geq 8$

Chapter 5

Review & Refresh

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. $d = -48$

13. $x = 21$

14. $n = 40$

15. $a = -9$

16. $k = -5$

17. $y = -3$

18. $w = 1.8$

19. $z = 90$

20. $4p = 35$; $p = \$8.75$

5.1 Exploration

Exploration 1

- Sample answer:* 9 : 15, 1 : 15, 9 : 5
- Sample answer:* 4.5 : 7.5; 0.5 : 7.5; 4.5 : 2.5; yes; The ratios are equivalent.

Exploration 2

- a. *Sample answer:*

x	5	20	10	15
y	1	4	2	3

x	$\frac{1}{4}$	$\frac{3}{2}$	$\frac{3}{4}$	1
y	$\frac{1}{2}$	3	$\frac{3}{2}$	2

- yes; yes; *Sample answer:* The values of the ratios are the same.
- yes; *Sample answer:* The operations generate equivalent ratios.

5.1 Practice

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

2. $\frac{500}{1}$

3. $\frac{29}{4}$

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

5. Coffee (ounces)	4	8	12	16
Cream (ounces)	$\frac{3}{8}$	$\frac{3}{4}$	$\frac{9}{8}$	$\frac{3}{2}$

The equivalent ratios are $4 : \frac{3}{8}$, $8 : \frac{3}{4}$, $12 : \frac{9}{8}$, and $16 : \frac{3}{2}$.

6. Yards	4	6.25	9.75	25
Seconds	6.4	10	15.6	40

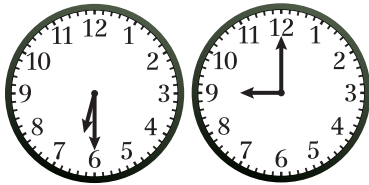
The equivalent ratios are $4 : 6.4$, $6.25 : 10$, $9.75 : 15.6$, and $25 : 40$.

7. 1500 sq ft
8. a. 6 milliliters of essential oils; 144 milliliters of avocado oil
b. $\frac{1}{2}$ milliliter of essential oils, 12 milliliters of avocado oil, 3 milliliters of coconut oil
9. $1\frac{2}{3}$ cups of water

5.2 Exploration

Exploration 1

- a. 90° ; *Sample answer:* $90^\circ : \frac{1}{4}$ h
- b. yes; *Sample answer:* Double the quantities.
- c. $360^\circ : 1$ h; *Sample answer:* Multiply the quantities by 2.5.
- d.



75° ; 30° ; *Sample answer:* The hour hand moves 30° per hour.

5.2 Practice

1. \$0.225 per can 2. \$0.0645 per oz
3. about 1.82 m/sec
- 4.

Distance (centimeters)	14	$\frac{3}{2}$	$\frac{21}{2}$	$\frac{7}{4}$
Time (minute)	$\frac{4}{3}$	$\frac{1}{7}$	1	$\frac{1}{6}$

The equivalent ratios are $14 : \frac{4}{3}$, $\frac{3}{2} : \frac{1}{7}$, $\frac{21}{2} : 1$, and $\frac{7}{4} : \frac{1}{6}$.

5. 53 bacteria per hour
6. a. B b. A c. B
- d. *Sample answer:* protein
- e. calories

7. a. \$6 for 4 scoops b. \$1.50 per scoop
- c. \$18
- d. *Sample answer:* The graph would be a line that would be above the given graph except at point (0, 0).
- e. The point would become (4, 7).

5.3 Exploration

Exploration 1

- a. 180 min; $(9 \text{ ft} \times 25 \text{ ft}) \times \frac{40 \text{ min}}{50 \text{ ft}^2} = 180 \text{ min}$
- b. *Sample answer:* Proportional quantities have an equivalent ratio of one quantity to another quantity.
- c. no; *Sample answer:* The unit rates are not equivalent.
- d. 48 min; *Sample answer:* Four hours of work divided among five people is $\frac{4}{5}$ hour, or 48 minutes per person.

5.3 Practice

1. yes 2. yes
3. no 4. yes
5. no 6. \$2.51
7. yes; $\frac{15}{12} = \frac{5}{4}$ and $\frac{10}{8} = \frac{5}{4}$
8. no; 3 fluid ounces of vinegar
9. a. \$13 per pair b. \$12 per pair
- c. \$11.50 per pair
- d. no; The cost per pair is different for each number of pairs of sandals that are purchased.
- e. *Sample answer:* The buyer will purchase 2 sets of 10 for \$253, getting 2 pairs free, 1 set of 8 for \$96, and two sets of 5 for \$130 for a total cost of \$479.
10. all values of x and y such that $y = 3x$
11. all values of x and y such that $y = \frac{5}{4}x$

5.4 Exploration

Exploration 1

- a. *Sample answer:* Determine the value of the ratio of miles to minutes, then multiply by 90 minutes.
- b. yes; *Sample answer:* To find the value of x , set up the proportion $\frac{50}{40} = \frac{x}{90}$ and solve to get $x = 112.5$ minutes.
- c. 120 mi

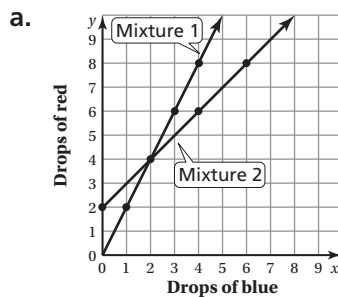
- d. Answers will vary. Some possibilities are using the unit rate and solving by proportions.

5.4 Practice

- The ratio of the length and height for each day should be set equal; $\frac{3.1}{h} = \frac{15.5}{45}$.
- $\frac{3}{16} = \frac{r}{128}$
- $x = 15$
- $y = 136$
- $r = 0.12$
- 120 seashells
- no; $\frac{21}{6.50} = \frac{252}{p}$; $p = \$78$
- $\frac{1}{4}$ cup
- a. $\frac{6}{7}, \frac{12}{14}, \frac{18}{21}$ b. $\frac{6}{11}, \frac{12}{22}$
 - 12 gray keys and 22 black keys
 - 12 gray keys, 22 black keys, 14 blue keys, 1 yellow key, and 1 green key
- Sample answer:* $p = 14$ and $q = 20$; $p = 21$ and $q = 30$

5.5 Exploration

Exploration 1



mixture 1; *Sample answer:* The line goes directly through the origin.

- 2 drops of red per drop of blue; *Sample answer:* The point (1, 2) represents the unit rate.
- Multiply x by 2 to get y ; $y = 2x$

5.5 Practice

- (0, 0); 0 pounds of chicken costs \$0.
(3, 12); 3 pounds of chicken costs \$12.
(5, 20); 5 pounds of chicken costs \$20.
The cost of the chicken is \$4 per pound.
- (0, 0); You earn \$0 for working 0 hours.
(2, 50); You earn \$50 for working 2 hours.
(4, 100); You earn \$100 for working 4 hours.
The earnings are \$25 per hour.
- $y = 2$ 4. $y = 7$

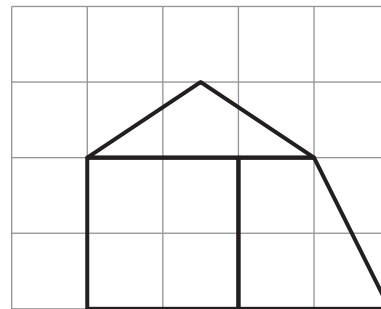
- $y = 6$ 6. $y = 4$
- a. Class A: 80%; Class B: 70%
b. \$60 c. \$7.50
- $k = 2$; $y = 2x$ 9. $k = \frac{3}{2}$; $y = \frac{3}{2}x$
- $k = \frac{11}{2}$; $y = \frac{11}{2}x$

- yes; Two quantities x and y are proportional when $y = kx$, where $k \neq 0$ and the graph of $y = kx$ is a line that passes through the origin;
no; A graph that passes through the origin but is not a line does not represent a proportional relationship.

5.6 Exploration

Exploration 1

- The ratio of the lengths is 1 cm : 4 m.
- Sample answer:* The ratio of the areas is 1 cm² : 16 m².
- no; *Sample answer:* The ratios are not equivalent.
- Sample answer:* 1 cm : 8 m



The shape is the same but the size changes.

5.6 Practice

- a. 12 ft by 20 ft b. 8 ft by 6 ft
c. 14 ft d. 8 : 7
e. 1 : 1; They both have the same number of squares.
- f. closet g. both the same
- 25 km 3. 12.5 in.
- 9.6 ft 5. 13 m
- no; The proportion should be $\frac{1}{8} = \frac{x \text{ ft}}{48 \text{ ft}}$; $x = 6 \text{ ft}$

Chapter 6

Review & Refresh

- $\frac{1}{4}$ 2. $\frac{13}{20}$
- $1\frac{1}{10}$ 4. $2\frac{1}{2}$

5. $\frac{3}{20}$

6. $\frac{3}{50}$

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

8. 20%

9. 25%

10. 84%

11. 140%

12. 265%

13. 150%

14. 60%

6.1 Exploration**Exploration 1**

- a. 7%; *Sample answer:* convert both to decimals, $0.07 > 0.05$
- b. 0.37; *Sample answer:* convert both to decimals, $0.37 > 0.\bar{3}$
- c. $\frac{5}{8}$; *Sample answer:* convert both to decimals, $0.625 > 0.375$
- d. $12\frac{3}{5}$; *Sample answer:* convert both to decimals, $12.6 > 12.56$
- e. $5\frac{5}{6}$; *Sample answer:* convert both to decimals, $5.8\bar{3} > 5.6$

Exploration 2

Answers will vary.

6.1 Practice

1. $\frac{1}{4}$ 2. $\frac{5}{9}$
3. 3.2 4. 1
5. $2.1\bar{6}$; $216.\bar{6}\%$ 6. $2.\bar{27}$; $227.\bar{27}\%$
7. $0.00\bar{3}$; $0.\bar{3}\%$ 8. 0.003; 0.3%
9. 1.333, 133.33%, $\frac{4}{3}$, 1.334; *Sample answer:* Convert every number to a decimal.
10. 81.8%, $\frac{9}{11}$, 0.8182, $0.8\bar{2}$; *Sample answer:* Convert every number to a decimal.
11. a. 3rd grade b. 2nd grade
- c. $\frac{0.69\bar{4}}{0.52} \approx 1.33547$ times more
- d. no; There was an improvement from 2nd grade to 3rd grade, and a decline after 3rd grade.
12. 13 or more students; At least 52% of 25 or $0.52 \times 25 = 13$ students brought their own lunch.

13. *Sample answer:* writing a decimal as a percent; It is easier than finding an equivalent fraction with a denominator of 100 or using long division.

6.2 Exploration**Exploration 1**

- a. 50%; 15; percents of 30
20%; 60%; 30; 60; percents of 75
 $33\frac{1}{3}\%$; $66\frac{2}{3}$; 24; 48; 72; percents of 72
- b. 15; 20%; 72
- c. *Sample answer:* You can make a ratio table comparing the number to the percent. You can write a proportion comparing the ratio of the number to the percent.

Number	30	15	$\frac{30}{100} = \frac{x}{50}$ $1500 = 100x$ $15 = x$
Percent	100	50	

$\div 2$

Both methods show that 50% of 30 is 15.

- d. *Sample answer:* 40% of 75 is what number?; 30

6.2 Practice

1. $\frac{33}{w} = \frac{55}{100}$; $w = 60$ 2. $\frac{42}{120} = \frac{p}{100}$; $p = 35$
3. $\frac{36}{w} = \frac{0.8}{100}$; $w = 4500$ 4. $\frac{48}{64} = \frac{p}{100}$; $p = 75$
5. 72 runners 6. $\frac{3.69}{w} = \frac{90}{100}$; $w = \$4.10$
7. $6.25\% = \frac{6.25}{100}$; $\frac{6}{w} = \frac{6.25}{100}$; $w = 96$
8. 30 students; $\frac{21}{w} = \frac{70}{100}$; $w = 30$
9. \$2.88; $\frac{7.2}{w} = \frac{250}{100}$; $w = 2.88$
10. $\frac{27}{100}$ cup; $\frac{a}{\frac{3}{8}} = \frac{72}{100}$; $a = \frac{27}{100}$
11. $\frac{1.4}{1.12} = \frac{p}{100}$; $p = 1.25$ 12. $\frac{86.8}{w} = \frac{140}{100}$; $w = 62$
13. $\frac{1}{2}x$
14. a. $31.5x$
b. 56.25%

6.3 Exploration

Exploration 1

- Person A: 20%, Person B: 25%, Person C: 15%, Person D: 40%; *Sample answer:* Use the percent proportion, division, or ratio tables.
- $\text{part} = \text{percent} \times \text{whole}$; *Sample answer:* Multiplying both sides of the equation by the “whole” provides the equation $\text{part} = \text{percent} \times \text{whole}$.
- Person A: 30, Person B: 24, Person C: 24, Person D: 42
- Sample answer:* Use a proportion to solve; I prefer the percent equation because it is a more efficient method to solve the problem.

6.3 Practice

- $27 = 0.005 \cdot w$; 5400
- $a = 1.25 \cdot 240$; 300
- $28 = 0.014 \cdot w$; 2000
- $27 = p\% \cdot 72$; 37.5%
- 9.44 in.
- 20,000 gal
- yes
- 320 students
 - 80 students
 - 32 students
 - 64 students
- 10.8
- 1000 and 1500
- true; $A = \frac{45}{100} \cdot B$, so $\frac{A}{B} = \frac{45}{100} = \frac{9}{20}$.

6.4 Exploration

Exploration 1

- 880 salmon
- about 360 salmon
- 12%
- Sample answer:* The population of a city increases by 5% every year.

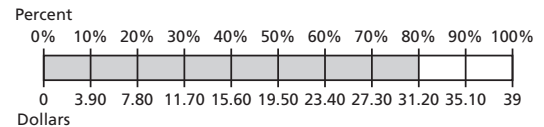
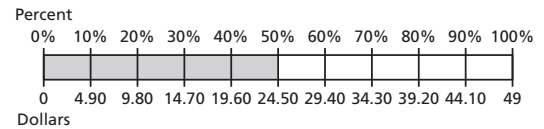
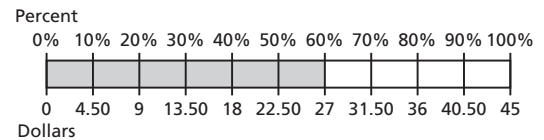
6.4 Practice

- decrease; 25%
- increase; 107.3%
- increase; 100%
- decrease; 60%
- 3.7% decrease
- 2% decrease
 - 1152 hamburgers
- \$36.00
 - 4.2% increase
- 14.3% increase
 - 14.3% increase
 - Troop B
 - neither troop; The percent of change is the same.

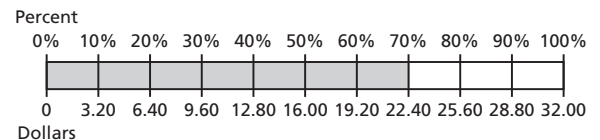
6.5 Exploration

Exploration 1

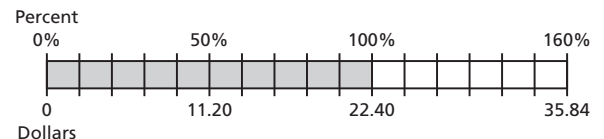
- Store B;



- \$32; *Sample answer:*



- \$35.84; *Sample answer:*



6.5 Practice

- \$71.50
- 65%
- \$72
- \$2128
- 40%
- \$350
- \$31.94
 - \$36.73
 - yes; \$33.05
- \$37.99
 - 39%
 - \$27.99
 - 54%

6.6 Exploration

Exploration 1

- Sample answer:* Every year the balance increases by \$9.
- The amount of interest each year is determined by multiplying the original amount, \$150, by the simple interest rate, 6%.
- Sample answer:* Multiply the initial amount, interest rate, and the period of time together.
- 10%; \$300

6.6 Practice

- \$332.80
 - \$2932.80
- \$1593.75
 - \$76,593.75
- 4.75%
 - 6.5%

5. 6 months 6. 3 years
 7. \$35,000; \$291.67 8. \$7800
 9. 9% 10. 10%
 11. a. \$1208.10 b. \$1220.18 c. \$1228.11
 d. \$28.11 e. 2.3%
 12. 8%

Chapter 7

Review & Refresh

1. 2 : 3 2. 5 : 3
 3. 1 : 2 4. 1 : 4
 5. 3 : 20 6. 2 : 3
 7. 1 : 5 8. 7 : 17
 9. 2 : 3 10. 3 : 7

7.1 Exploration

Exploration 1

- a. Spinner 1: more likely: 1, 5, 6, less likely: 2, 3, 4;
 The numbers 1, 5, and 6 have a greater area than
 the numbers 2, 3, and 4, so you are more likely to
 spin them.
 On Spinner 2, all numbers have the same area, so
 you are equally likely to spin each number.
- b. Answers will vary.
- c. *Sample answer:* Use the area from the spinner
 that each number occupies and divide that area
 by the area of the entire spinner. Turning this
 decimal into a percent can be used to describe the
 likelihood of spinning each number.

7.1 Practice

1. a. 1 b. triangle
 2. a. 4 b. star, star, star, star
 3. a. 8
 b. star, star, star, star, circle, circle, circle, triangle
 4. a. 8
 b. triangle, star, star, star, star, square, square,
 square
 5. a. 18 b. 12 c. 6
 d. unlikely; Choosing a dog has a probability of $\frac{1}{3}$,
 or 33.3%, which is unlikely.
 6. likely 7. certain
 8. unlikely

9. a. equally likely; impossible
 b. unlikely; likely
 c. unlikely; unlikely

7.2 Exploration

Exploration 1

- a. Answers will vary. Students should notice that
 even though their results may differ, they tend to
 be close to each other.
- b. Answers will vary. The results for flipping the
 quarter should be close to equal numbers of heads
 and tails. The results for the thumbtack will vary.
- c. Answers will vary. The prediction for the quarter
 should be close to 500, using the results from
 part (b). The prediction for the thumbtack should
 use the result from part (b) to find the number.
- d. yes; The results of flipping a quarter tend to be
 50% heads and 50% tails, so you can use a uniform
 probability model for flipping the quarter.

7.2 Practice

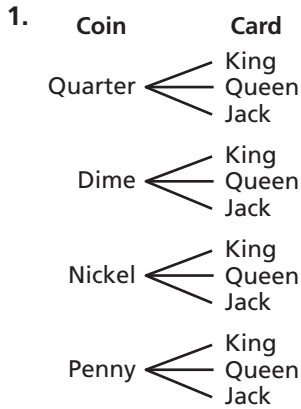
1. $\frac{7}{20}$ 2. $\frac{9}{20}$
 3. $\frac{4}{5}$ 4. $\frac{13}{20}$
 5. a. $\frac{7}{30}$
 b. 28 containers; $120 \cdot \frac{7}{30} = 28$
 6. a. $\frac{1}{8}$ b. $\frac{7}{8}$ c. $\frac{7}{50}$ d. $\frac{3}{25}$
 e. 24 times; $200 \cdot \frac{3}{25} = 24$
 7. $\frac{3}{21} = \frac{1}{7}$
 8. a. $\frac{3}{5}$ b. 14 dogs

7.3 Exploration

Exploration 1

- a. 10 outcomes; 1000 combinations
- b. *Sample answer:* Multiply to find the total number
 of possible combinations:
 $10 \times 10 \times 10 = 1000$ combinations.
- c. 64,000 combinations
- d. 10,000 combinations
- e. The lock in part (c) is most difficult to guess
 because it has the greatest number of possible
 combinations compared to the other two locks.

7.3 Practice



Sample space: Quarter King, Quarter Queen, Quarter Jack, Dime King, Dime Queen, Dime Jack, Nickel King, Nickel Queen, Nickel Jack, Penny King, Penny Queen, Penny Jack; 12 possible outcomes

- 18 possible outcomes
- 2,176,782,336; 1,402,410,240
- $\frac{1}{78,960,960}$
- a. 5040
b. $720; 6 \cdot 5 \cdot 4 \cdot 1 \cdot 3 \cdot 2 \cdot 1 = 720$
- 6,760,000; 60,840,000

7.4 Exploration

Exploration 1

- Sample answer:* yes; If the player makes 80% of her free throws, she can be expected to make $0.8 \cdot 3 = 2.4$ of her next three shots.
- Sample answer:* The digits 0 to 7 represent made shots and the digits of 8 and 9 represent missed shots.
- $\frac{13}{30}$, or 43.3%; $\frac{1}{6}$, or 16.6%; $\frac{5}{6}$, or 83.3%; $\frac{7}{10}$, or 70%
- Sample answer:* Randomly generate 30 numbers from 0 to 9999. Let 0–5 represent made shots and 6–9 represent missed shots.

7.4 Practice

- Sample answer:* $\frac{23}{30}$
- Sample answer:* $\frac{0}{30} = 0$

- Sample answer:* Use a simulation with randomly generated numbers from 0 to 99,999. Let the digits 1 through 9 represent hitting the head pin. Use the random number generator on a graphing calculator to generate 30 numbers. The table shows the results. Find the number of outcomes that represent hitting the head pin in exactly 4 of the next 5 times.

70108	88222	37091	11757	45059
98905	69774	54406	63783	92951
67423	79802	55220	33769	21873
62173	88110	12430	45003	46658
28603	81688	98168	49197	40419
22910	62789	61740	80684	77343

The experimental probability is $\frac{13}{30} = 43.\bar{3}\%$.

- Sample answer:* Use a simulation with randomly generated numbers from 0 to 999. Let the digits 1 through 4 represent a pineapple plant producing a pineapple this year. Use the random number generator on a graphing calculator to generate 30 numbers. The table shows the results. Find the number of outcomes that represent a pineapple plant producing a pineapple this year in at most 2 of the next 3 pineapples.

463	925	624	333	454
804	867	257	716	468
477	212	094	361	634
137	666	012	597	277
011	920	835	255	725
246	100	730	221	593

The experimental probability is $\frac{27}{30} = \frac{9}{10} = 90\%$.

5. *Sample answer:* Use a simulation with randomly generated numbers from 0 to 99. Let the digits 0 and 1 represent receiving a workout towel. Let the digits 2 and 3 represent receiving a water bottle. Let the digits 4 and 5 represent receiving a heart monitor. Let the digits 6 and 7 represent receiving a T-shirt. Let the digits 8 and 9 represent receiving a gift card. Use the random number generator on a graphing calculator to generate 30 numbers. The table shows the results. Find the number of outcomes that represent one customer receiving a heart monitor and one receiving a gift card.

81	93	49	09	40
64	35	81	72	02
38	36	23	18	23
78	45	33	71	94
72	13	37	56	58
33	22	27	89	19

The experimental probability is $\frac{3}{30} = \frac{1}{10} = 10\%$.

6. *Sample answer:* Use a simulation with number cubes. Rolls of 1 through 2 represent a finished dinner plate. Roll 3 number cubes to generate 20 numbers. The table shows the results. Find the number of outcomes that represent a finished dinner plate for at least 2 of the next 3 dinner plates.

426	434	125	262	531
313	212	246	134	512
552	641	546	446	616
512	265	132	533	232

The experimental probability is $\frac{7}{20} = 35\%$.

7. *Sample answer:* Use a simulation with number cubes. Rolls of 1 through 5 represent a win. Roll 4 number cubes to generate 20 numbers. The table shows the results. Find the number of outcomes that represent a win for exactly 3 of the next 4 times you play the game.

2153	5656	1331	4566	4264
4461	4524	5315	2611	1324
2232	2642	1664	4535	4125
5463	4563	2653	5453	3613

The experimental probability is $\frac{8}{20} = \frac{2}{5} = 40\%$.

Chapter 8

Review & Refresh

- 19.8
- 103.5
- 47.5
- In Exercise 2, 198 is an outlier and it increased the value of the mean.
- median: 45; Q1: 29.5; Q3: 55; IQR: 25.5
- median: 199.5; Q1: 183; Q3: 213.5; IQR: 30.5
- median: 3.8; Q1: 2.6; Q3: 6.8; IQR: 4.2
- In Exercise 6, 110 is an outlier.

8.1 Exploration

- Population: all students at your school; *Sample answer:* boys, girls, your art class, band members, basketball players
- Sample answer:* In all of the samples, each member of the population is not equally likely to be selected.
- Sample answer:* The first sample is not random, but the second sample is random; no; In the first sample, students selected are more likely to choose band due to already being a band member. In the second sample, $\frac{1}{10}$ of the students in the random sample chose glee club, so the conclusion that 10% of the students in your school chose glee club is valid.
- Sample answer:* What percent of students in your school like math?; Sample every tenth student who enters the school on a given day.

8.1 Practice

- fans at the Miami Dolphins and Dallas Cowboys game
 - 50 fans with season tickets for the Dolphins
 - biased; Dolphins fans are more likely to say that the Dolphins will win. You must also survey the Cowboy fans.
- sample B; surveyed your town, rather than just your neighborhood
- sample; It would not be easy to survey every student at your school.
- population; It is possible for you to ask all the students in your history class.
- 12 students
- 92 students
 - yes; *Sample answer:* Adults in their 70s are less likely to prefer rap music.

8.2 Exploration

Exploration 1

- a. a seventh grader that has visited a planetarium
- b. Answers will vary.
- c. Answers will vary.
- d. Answers will vary, but will be close to the stated probability of 60%.

8.2 Practice

1.
 - a. Check students' work.
 - b. Check students' work.
 - c. Check students' work. *Sample answer:* yes; increase the number of random samples
2.
 - a. Check students' work.
 - b. Check students' work.
 - c. Check students' work.
 - d. Check students' work.
 - e. Check students' work.

8.3 Exploration

Exploration 1

- a. yes; *Sample answer:* The data set for female students completely overlaps the data set for male students.
yes; Sample answer: The data sets for male and female students partially overlap.
no; The oldest person in the 8 P.M. class is 40. The youngest person in the 10:00 A.M. class is 42.
- b. *Sample answer:* talk about how many values are in both data distributions and how much overlap there is; using measures of center and measures of variation
- c. *Sample answer:* the stem-and-leaf plot; The more the two graphs overlap, the less significant the differences are.

8.3 Practice

1.
 - a. Garden A: median: 54; IQR: 18
Garden B: median: 42; IQR: 18
The variation in the height of the corn stalks is the same, but Garden A had 12 more inches than Garden B.
 - b. The difference in the medians is about 0.67 times the IQR.
 - c. no; The quotient in part (b) is less than 2, so the difference in the medians is not significant.

2.
 - a. Team A: median: 3; IQR: 3
Team B: median: 10; IQR: 3
 - b. Team A
 - c. yes; The difference in the medians is about 2.3 times the IQR. This quotient is greater than 2, so the difference in the medians is significant.

8.4 Exploration

Exploration 1

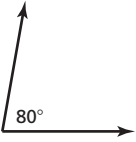
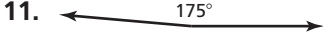
- a. male students: median = 2.5, IQR = 4
female students: median = 3, IQR = 4
The female students had a greater median homework time than the male students. The variation in the time spent on homework was the same for both male and female students.
- b. no; *Sample answer:* The sample taken was random, but the sample size is not large enough to provide accurate data.
- c. The medians in the double box-and-whisker plot are greater and the IQRs in the double box-and-whisker plot are lesser.
- d. female students spend more time on homework each week than male students; *Sample answer:* 75% of female students spend more than 3.5 hours on homework. Only 25% of male students spend more than 3.5 hours on homework.
- e. *Sample answer:* If your sample size is too small, take multiple random samples so that you can compare two populations.

8.4 Practice

1.
 - a. Football: mean: 189, median: 178, mode: 178, range: 158, IQR: 28, MAD: 22.89
Basketball: mean: 199, median: 194, no mode, range: 145, IQR: 47, MAD: 31.67
 - b. The median and the IQR; both distributions are skewed.
 - c. The basketball pep rallies have greater measures of central tendency because the mean and median are greater. Football has a greater range, but basketball has greater interquartile range and mean absolute deviation.
 - d. no; Basketball has greater measures of center and greater measures of variation. Also, the sample size of 18 is small.
2. no; A sample size of 10 is too small to make a conclusion. Also, only 12 of the 120 frozen food products were sampled.

Chapter 9

Review & Refresh

1. trapezoid, triangle 2. rectangles
3. rectangle, trapezoids
4. trapezoid, rectangles, circles
5. trapezoids, rectangle
6. 60° ; acute 7. 120° ; obtuse
8. 65° ; acute 9. 165° ; obtuse
10. 
11. 

9.1 Exploration

Exploration 1

- a. 4 in.
- b. about 12.5 in.; *Sample answer:* The circumference of the circle was estimated to be a little over 3 times the length of the diameter.

Exploration 2

- a. Check students' work.
- b. circumference; *Sample answer:* roughly 3.14 times greater
- c. *Sample answer:* All students have the same ratio no matter what cylindrical object was used.
- d. multiply the diameter by 3.14; 12.56 in.

9.1 Practice

1. about 81.64 m 2. about 37.68 ft
3. about 264 in. 4. about 72 yd
5. about 38.55 ft 6. about 28.27 cm
7. a. Circle C; *Sample answer:* Circle C has the greatest radius.
b. Circle B; *Sample answer:* Circle B has the smallest radius.
c. Circle A: about 15.7 ft, Circle B: about 6.28 ft, Circle C: about 200.96 ft, Circle D: about 21.98 ft; 32 times larger; *Sample answer:* You can compare the radii. The radius of Circle C is 32 times the radius of Circle B.
8. about 9.42 in.
9. yes; The diameter of each of the small circles in diagram B is 2 feet. Because there are 5 circles along each side of the square, the length of each side is $5 \cdot 2 = 10$ feet.

10. about 9.6 times

9.2 Exploration

Exploration 1

Sample answer: 12 cm^2 ; 12.5 cm^2 ; 12.5625 cm^2 ; The grid with the smallest squares should be closest to the actual area of the circle because you can better estimate the number of squares in the circle.

Exploration 2

- a. $A = \pi r^2$; height of parallelogram = r , base of parallelogram = $\frac{C}{2} = \frac{2\pi r}{2} = \pi r$,
Area = $bh = \pi r^2$.
- b. $r = 2 \text{ cm}$; $A = \pi(2)^2 \approx 12.56 \text{ cm}^2$

9.2 Practice

1. about 962.5 in.² 2. about 19.625 m²
3. about 7234.56 mm² 4. about 157 in.²
5. about 100.48 m² 6. about 693 ft²
7. about 2464 ft² 8. about 28.26 ft²
9. a. $A = \pi r^2$ b. $A = \pi \left(\frac{r}{2}\right)^2$
c. The area of a circle is one fourth of the area of the circle whose radius is twice as large; *Sample answer:* The area formula for the smaller circle can be rewritten as $A = \pi \left(\frac{r}{2}\right)^2 = \frac{1}{4}\pi r^2$. So, this is one fourth of the area of the larger circle.
10. 2 units; Set the circumference equal to the area to get $2\pi r = \pi r^2$. So, $\pi \cdot r \cdot 2 = \pi \cdot r \cdot r$ and the value of r must be 2.

9.3 Exploration

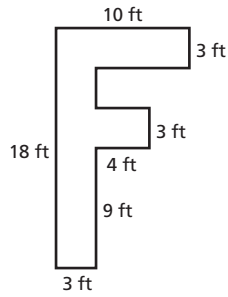
Exploration 1

Answers will vary.

9.3 Practice

1. perimeter: about 22 units, area: about 20 units
2. perimeter: 28 units, area: 16 units
3. perimeter: about 22 units, area: about 36 units
4. perimeter: 27 m, area: 42.5 m²
5. perimeter: about 140.76 cm, area: about 1485.46 cm²
6. perimeter: 28 in., area: about 22.87 in.²
7. The perimeter calculation included the circumference of the circle instead of the perimeter of the semicircle.
Perimeter $\approx 2 + 7 + 2 + 10.99$
 $= 21.99 \text{ ft}$

8. *Sample answer:*



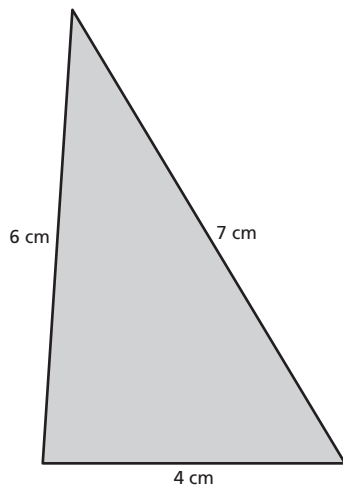
yes; For example, if the 11 ft by 3 ft rectangle on the bottom of the F is shortened to be a 6 ft by 3 ft rectangle, the perimeter decreases by 10 ft.

9. about \$211.31

9.4 Exploration

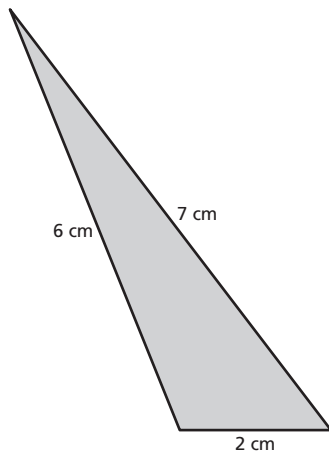
Exploration 1

a. i.



1 triangle

ii.

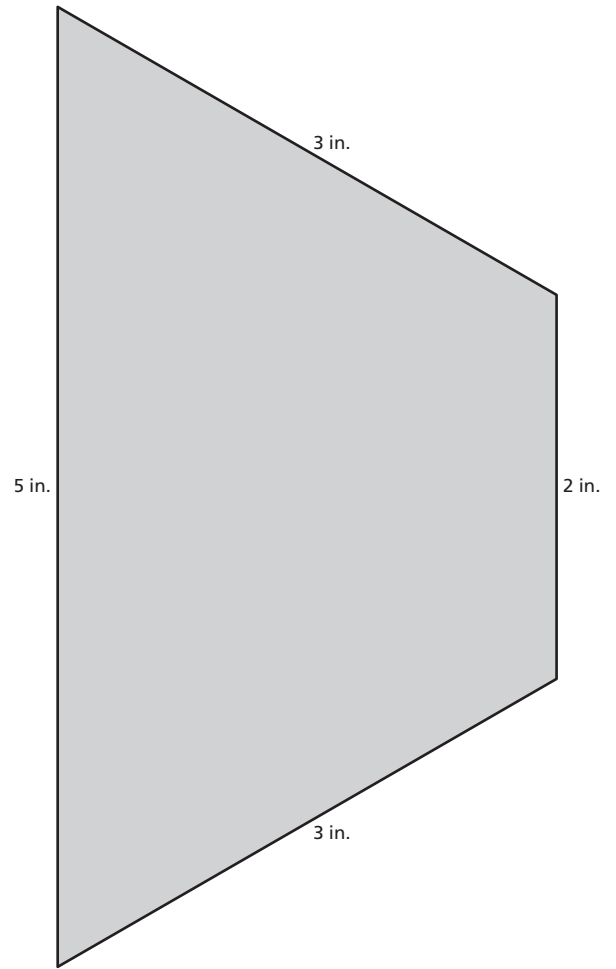


1 triangle

iii. none

iv. none

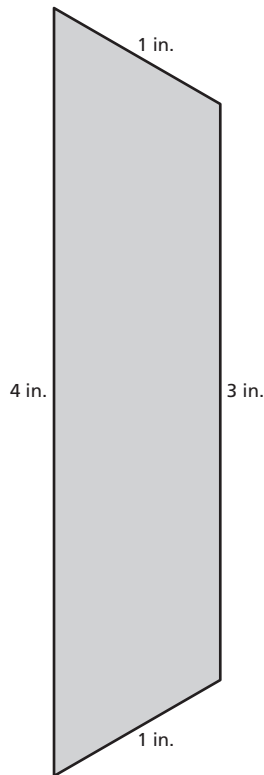
v. *Sample answer:*



infinitely many quadrilaterals

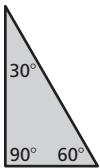
vi. none

vii. *Sample answer:*



infinitely many quadrilaterals

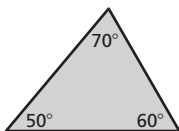
viii.



infinitely many triangles

ix. none

x.

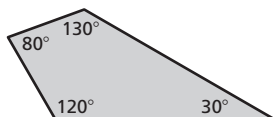


infinitely many triangles

xi. none

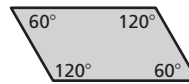
xii. none

xiii. *Sample answer:*



infinitely many quadrilaterals

xiv. *Sample answer:*

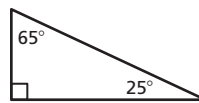


infinitely many quadrilaterals

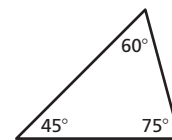
- when the sum of the angle measures is 180° ; when the sum of the lengths of any two sides is greater than the length of the third side; *Sample answer:* All triangles that could be formed in part (a) follow these guidelines.
- when the sum of the angle measures is 360° ; when the sum of the lengths of any three sides is greater than the length of the fourth side; *Sample answer:* All quadrilaterals that could be formed in part (a) follow these guidelines.

9.4 Practice

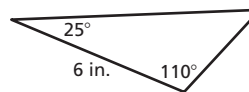
1.



2.

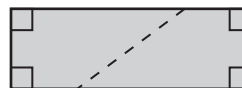


3.

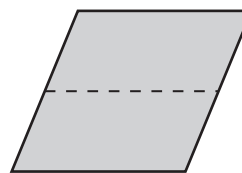


- one triangle; Only one triangle can be drawn with a 2-inch side, 4-inch side, and 5-inch side.
- no triangles; None of the sides of a scalene triangle are equal.
- many triangles; The other two sides of the triangle can be many different lengths.
- false; The width needs to be half the length.
 - true; Each square has a side length of 10 inches.
 - true; Each rhombus has a side length of 3 feet.

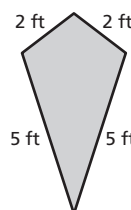
d. true; *Sample answer:*



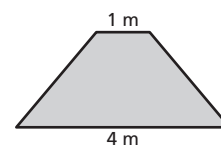
e. true; *Sample answer:*

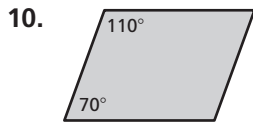


8.



9.





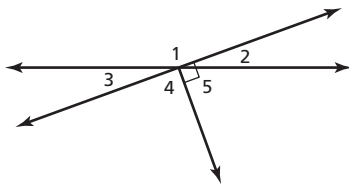
9.5 Exploration

Exploration 1

- $\angle BAE$ and $\angle BAC$, $\angle BAE$ and $\angle EAD$, $\angle CAD$ and $\angle BAC$, $\angle CAD$ and $\angle EAD$; *Sample answer:* All adjacent angles share a common side and have the same vertex.
- $\angle BAC$ and $\angle EAD$, $\angle BAE$ and $\angle CAD$; *Sample answer:* All vertical angles are opposite angles formed by the intersection of two lines.
- $y = 155$; *Sample answer:* vertical angle to $\angle BAC$
 $x = 25$; *Sample answer:* supplementary angle to $\angle BAC$
 $z = 25$; *Sample answer:* Supplementary angle to $\angle BAC$
- Sample answer:* Vertical angles have the same measure.
- Check students' work.

9.5 Practice

- Sample answer:* adjacent: $\angle IED$ and $\angle DEF$;
 $\angle FEG$ and $\angle GEH$; vertical: $\angle DEF$ and $\angle GEH$;
 $\angle FEG$ and $\angle DEH$
- Sample answer:* adjacent: $\angle SUT$ and $\angle SUZ$;
 $\angle XUY$ and $\angle WUX$; vertical: $\angle SUZ$ and $\angle WUX$;
 $\angle YUZ$ and $\angle VUW$
- adjacent; $x = 123$ 4. complementary; $x = 6$
- supplementary; $x = 11$
- vertical; $x = 30$
- Sample answer:*



- $x = 5; y = 5$ 9. 75°
- a. $x + c = 90$ b. $x + s = 180$

Chapter 10

Review & Refresh

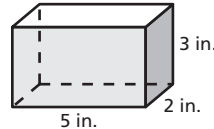
- 64 cm^2 2. 84 yd^2
- 58.88 in.^2 4. $\frac{25}{36} \text{ m}^2$
- $3\frac{1}{9} \text{ mm}^2$ 6. 321.63 ft^2

- 6.25 ft^2 8. 20 cm^2
- 12 ft^2 10. 21 m^2
- 30 yd^2 12. 10 in.^2
- 9 mm^2 14. 24 ft^2

10.1 Exploration

Exploration 1

- $S = 2wh + 2\ell h + 2\ell w$; The surface area of a rectangular prism is the sum of the areas of the faces of the prism.
- Sample answer:* $h = 3 \text{ in.}$, $w = 2 \text{ in.}$, $\ell = 5 \text{ in.}$;



62 in.^2

Exploration 2

- triangular prism; 48 units^2
- Sample answer:* Find the sum of the areas of the faces shown by the net.

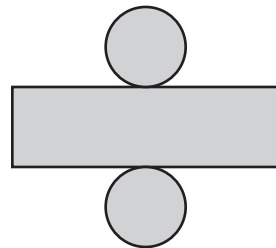
10.1 Practice

- 2520 cm^2 2. 136 ft^2
- 85.6 in.^2 4. 1544 m^2
- 600 cm^2 6. 456 ft^2
- a. 482 cm^2 b. 452.75 cm^2
- 5.3 in.

10.2 Exploration

Exploration 1

- Sample answer:*



two circles and one rectangle

- One dimension of the paper is the circumference of the can, and the other dimension of the paper is the height of the can.
- $S = 2\pi rh + 2\pi r^2$
- tuna can: radius $\approx 1.75 \text{ in.}$, height $\approx 1.5 \text{ in.}$, surface area $\approx 36 \text{ in.}^2$; tomato soup can: radius $\approx 1.5 \text{ in.}$, height $\approx 4 \text{ in.}$, surface area $\approx 52 \text{ in.}^2$

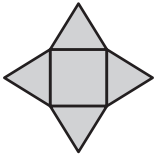
10.2 Practice

- $408\pi \approx 1281.1 \text{ ft}^2$
- $20\pi \approx 62.8 \text{ cm}^2$
- $260\pi \approx 816.4 \text{ m}^2$
- 552.6 in.^2
- $\frac{255}{512}\pi \approx 1.56 \text{ in.}^2$
 - $\frac{189}{256}\pi \approx 2.32 \text{ in.}^2$
 - $\frac{\$0.25}{1.56 \text{ in.}^2} \neq \frac{\$0.50}{2.32 \text{ in.}^2}; 0.16 \neq 0.22$
 - $\frac{\$0.25}{1.56 \text{ in.}^2} = \frac{\$0.50}{x \text{ in.}^2}; x = 3.12 \text{ in.}^2$

10.3 Exploration

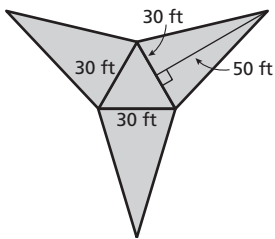
Exploration 1

- Answer should include, but is not limited to:



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

- Cheops Pyramid: $85,560 \text{ m}^2$, Louvre Pyramid: 1960 m^2 ; Find the area of a lateral face and multiply that by the number of lateral faces, 4.
- Sample answer:



2250 ft^2 ; Find the area of a lateral face and multiply that by 3.

10.3 Practice

- 70.09 cm^2
- 525.7 ft^2
- 52 ft
 - 3640 ft^2
 - $\$12,740.00$
- 7.8 m
 - 7 yd

10.4 Exploration

Exploration 1

- prism 1: $V = 6 \text{ units}^3, B = 6 \text{ units}^2$;
 - prism 2: $V = 12 \text{ units}^3, B = 6 \text{ units}^2$;
 - prism 3: $V = 18 \text{ units}^3, B = 6 \text{ units}^2$;
 - prism 4: $V = 24 \text{ units}^3, B = 6 \text{ units}^2$;
 - prism 5: $V = 30 \text{ units}^3, B = 6 \text{ units}^2$;

The volume of the rectangular prism is the area of the base times the height of the prism.

- prism 1: $V = 2 \text{ units}^3, B = 2 \text{ units}^2$;
 - prism 2: $V = 4 \text{ units}^3, B = 2 \text{ units}^2$;
 - prism 3: $V = 6 \text{ units}^3, B = 2 \text{ units}^2$;
 - prism 4: $V = 8 \text{ units}^3, B = 2 \text{ units}^2$;
 - prism 5: $V = 10 \text{ units}^3, B = 2 \text{ units}^2$;

The volume of the triangular prism is the area of the base times the height of the prism.

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

10.4 Practice

- $12,000 \text{ cm}^3$
- 1875 m^3
- 10.8 yd^3
 - 5.4 yd^3
- The volume in part (b) is equal to the volume in part (a) divided by 2.
- 5.4 yd^3
- yes; The volume in part (d) is equal to the volume in part (b).
- $238,548.1 \text{ gal}$
- 936 in.^3
- 0.85 L
- 27 ft^3

10.5 Exploration

Exploration 1

- Sample answer: The volume of the cube is 3 times larger than the volume of the pyramid.
- $V = \frac{1}{3}Bh$, where B is the area of the base of the pyramid and h is the height of the pyramid.
- Volume of prism = $2 \cdot 3 \cdot 5 = 30$

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

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

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

$$10 + 10 + 10 = 30$$

10.5 Practice

- 600 mm^3
- 140 ft^3
- Pyramid A container: $\$6.88$, Pyramid B container: $\$12.29$; Pyramid A container: The volume is 1375 cm^3 , which costs $\$6.88$. Pyramid B container: The volume is $200 \text{ in.}^3 \approx 3277.4128 \text{ cm}^3$, which costs $\$16.39$. Pyramid B is the large container, so after the 25% discount the cost is $\$12.29$.

4. a. 400 ft^3 b. 400 ft^3
- c. same as; All three pyramids have the same height of 10 feet. The base of the original pyramid has an area of 120 square feet. The two pyramids each have a base with an area of 60 square feet, which have a sum of 120 square feet.
5. *Sample answer:* The triangular base has a base length of 3.5 centimeters and a height of 60 centimeters.

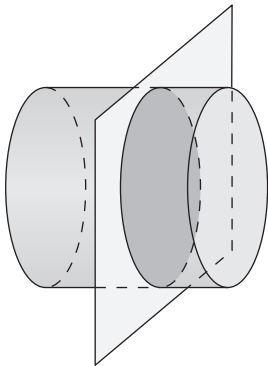
10.6 Exploration

Exploration 1

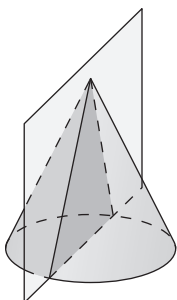
- a. rectangle
- b. rectangle
- c. triangle
- d. yes; A slice can be made vertically through the bread from the top to the bottom near the corner at an angle.
- e. *Sample answer:* rectangle, horizontal slice; triangle, vertical slice through top vertex; trapezoid, vertical slice not through top vertex; kite, diagonal slice through one of the bottom vertices; pentagon, diagonal slice through none of the vertices

10.6 Practice

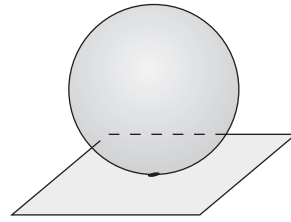
1. square 2. triangle
3. triangle 4. circle
5. circle;



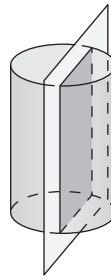
6. triangle;



7. possible;



8. not possible
9. possible;



10. not possible