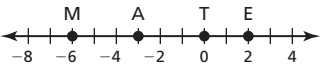



Selected Answers

Section 1.1

Integers and Absolute Value (pages 6 and 7)

1. 9, -1, 15 3. -6; All of the other expressions are equal to 6.
5. 6 7. 10 9. 13 11. 12 13. 8 15. 18
17. 45 19. 125 21. $|-4| < 7$ 23. $|-4| > -6$ 25. $|5| = |-5|$
27. Because $|-5| = 5$, the statement is incorrect. $|-5| > 4$
29. -8, 5 31. -7, -6, $|5|$, $|-6|$, 8 33. -17, $|-11|$, $|20|$, 21, $|-34|$
35. -4
37. a. MATE b. TEAM
-  
39. $n \geq 0$ 41. The number closer to 0 is the greater integer.
43. a. Player 3 b. Player 2 c. Player 1
45. false; The absolute value of zero is zero, which is neither positive nor negative.
47. 144 49. 3170



Section 1.2

Adding Integers (pages 12 and 13)

1. Change the sign of the integer. 3. positive; 20 has the greater absolute value and is positive.
5. negative; The common sign is a negative sign. 7. false; A positive integer and its absolute value are equal, not opposites.
9. -10 11. 7 13. 0 15. 10
17. -7 19. -11 21. -4 23. -34
25. -10 and -10 are not opposites. $-10 + (-10) = -20$
27. \$48 29. -27 31. 21 33. -85
35. Use the Associate Property to add 13 and -13 first. -8
37. *Sample answer:* Use the Commutative Property to switch the last two terms. -12
39. *Sample answer:* Use the Commutative Property to switch the last two terms. 11
41. -13 43. *Sample answer:* $-26 + 1$; $-12 + (-13)$
45. $b = 2$ 47. $6 + (-3) + 8$
49. Find the number in each row or column that already has two numbers in it before guessing.
51. 8 53. 183



Section 1.3

Subtracting Integers (pages 18 and 19)

1. You add the integer's opposite.
5. C
11. -5
17. 17
23. -20
29. 9
35. $c = 15$
41. *Sample answer:* $x = -2, y = -1; x = -3, y = -2$
43. sometimes; It's positive only if the first integer is greater.
45. always; It's always positive because the first integer is always greater.
47. all values of a and b
51. -45
7. B
13. -10
19. 1
25. $-3 - 9$
31. 7
37. 2
3. What is 3 less than -2 ?; $-5; 5$
9. 13
15. 3
21. -22
27. 6
33. $m = 14$
39. 3
49. when a and b have the same sign and $|a| > |b|$ or $|a| = |b|$
53. 468
55. 2378

Section 1.4

Multiplying Integers (pages 26 and 27)

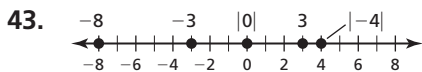
1. a. They are the same. b. They are different.
3. negative; different signs
5. negative; different signs
7. false; The product of the first two negative integers is positive. The product of the positive result and the third negative integer is negative.
9. -21
11. 12
13. 27
15. 12
17. 0
19. -30
21. 78
23. 121
25. -36
27. 54
29. -105
31. 0
33. -1
35. -36
37. 54
39. The answer should be negative. $-10^2 = -(10 \cdot 10) = -100$
41. 32
43. $-7500, 37,500$
45. -12
47. a.

Month	Price of Skates
June	$165 = \$165$
July	$165 + (-12) = \$153$
August	$165 + 2(-12) = \$141$
September	$165 + 3(-12) = \$129$
- b. The price drops \$12 every month.
- c. no; yes; In August you have \$135 but the cost is \$141. In September you have \$153 and the cost is only \$129.
49. 3
51. 14
53. D

Section 1.5

Dividing Integers (pages 32 and 33)

1. They have the same sign. They have different signs. The dividend is zero.
3. *Sample answer:* $-4, 2$ 5. negative 7. negative
9. -3 11. 3 13. 0 15. -6 17. 7 19. -10
21. undefined 23. 12
25. The quotient should be 0 . $0 \div (-5) = 0$ 27. 15 pages
29. -8 31. 65 33. 5
35. 4 37. -21 ft/min 39. 5
41. *Sample answer:* $-20, -15, -10, -5, 0$; Start with -10 , then pair -15 with -5 and -20 with 0 .

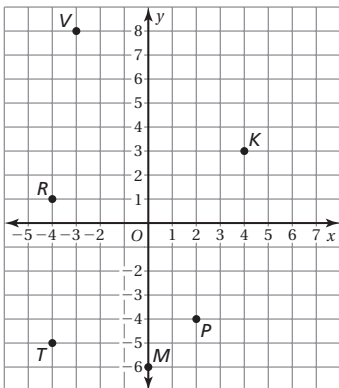


45. B

Section 1.6

The Coordinate Plane (pages 38 and 39)

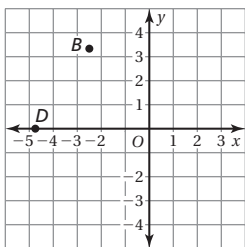
1. 4 3. $(2, -2)$ is in Quadrant IV, $(-2, 2)$ is in Quadrant II.
5. $(3, 1)$ 7. $(-2, 4)$ 9. $(2, -2)$ 11. $(-4, 2)$ 13. $(4, 0)$
- 15–25. See graph below.
15. Quadrant I
17. y -axis
19. Quadrant IV
21. Quadrant II
23. Quadrant III
25. Quadrant II



27. The numbers are reversed. To plot $(4, 5)$, start at $(0, 0)$ and move 4 units right and 5 units up.
29. $(-2, 1)$ 31. sometimes; It is true only for $(0, 0)$.
33. always; The x -coordinate of a point in Quadrant II is negative, and so is the y -coordinate of a point in Quadrant IV.
35. Flamingo Café
37. Because the La Selva Rainforest is in Quadrant IV, the x -coordinate of the point will be positive and the y -coordinate of the point will be negative.
39. $(2, 2)$



41–43. See graph below.



41. Quadrant II

43. x -axis

45. $-\frac{16}{2} < -\frac{12}{3}$

47. $3.45 > 3\frac{3}{8}$

Section 2.1

Rational Numbers

(pages 54 and 55)

1. A number is rational if it can be written as $\frac{a}{b}$ where a and b are integers and $b \neq 0$.
3. rational numbers, integers
7. repeating
11. 0.875
13. $-0.\overline{7}$
15. $1.8\overline{3}$
17. $-5.58\overline{3}$
19. The bar should be over the entire decimal. $-\frac{7}{11} = -0.\overline{63}$
21. $\frac{9}{20}$
23. $-\frac{39}{125}$
25. $-1\frac{16}{25}$
27. $-12\frac{81}{200}$
29. $-2.5, -1.1, -\frac{4}{5}, 0.8, \frac{9}{5}$
31. $-\frac{9}{4}, -0.75, -\frac{6}{10}, \frac{5}{3}, 2.1$
33. $-2.4, -2.25, -\frac{11}{5}, \frac{15}{10}, 1.6$
35. spotted turtle
37. $-1.82 < -1.81$
39. $-4\frac{6}{10} > -4.65$
41. $-2\frac{13}{16} < -2\frac{11}{14}$
43. Michelle
45. No; The base of the skating pool is at -10 feet, which is deeper than $-9\frac{5}{6}$ feet.
47. a. when a is negative
b. when a and b have the same sign, $a \neq 0 \neq b$
49. $\frac{7}{30}$
51. 21.15

Section 2.2

Adding and Subtracting Rational Numbers (pages 60 and 61)

- Because $|-8.46| > |5.31|$, subtract $|5.31|$ from $|-8.46|$ and the sign is negative.
 - What is 3.9 less than -4.8 ? -8.7 ; -0.9
 - $-\frac{5}{14}$
 - $2\frac{3}{10}$
 - -0.9
 - 1.844
 - $1\frac{1}{2}$
 - $\frac{1}{18}$
 - $-18\frac{13}{24}$
 - -2.6
 - 14.963
 - $\frac{3}{8} - \frac{5}{6} = -\frac{11}{24}$
 - $\frac{1}{18}$
 - $-3\frac{9}{10}$
 - No, the cook needs $\frac{1}{12}$ cup more.
- 31–33. Subtract the smallest number from the largest number.
- $-\frac{n}{4}$
 - $-\frac{b}{24}$
 - 35.88
 - $8\frac{2}{3}$
 - C



Section 2.3

Multiplying and Dividing Rational Numbers (pages 66 and 67)

- The same rules for signs of integers are applied to rational numbers.
- $-\frac{1}{3}$
- $-\frac{3}{7}$
- negative
- positive
- $-\frac{2}{3}$
- $-\frac{1}{100}$
- $2\frac{5}{14}$
- $3.\overline{63}$
- -6
- -2.5875
- $\frac{1}{3}$
- $2\frac{1}{2}$
- $-4\frac{17}{27}$
- 0.025
- 47.43
- -0.064
- The wrong fraction was inverted.
- 8 packages
- 1.3
- $-\frac{1}{4} \div \frac{3}{2} = -\frac{1}{4} \times \frac{2}{3}$
- $-4\frac{14}{15}$
- $-1\frac{11}{36}$
- $= -\frac{2}{12}$
- $191\frac{11}{12}$ yd
- $= -\frac{1}{6}$
- How many spaces are between the boards?
- a. $-2, 4, -8, 16, -32, 64$
- b. When -2 is raised to an odd power, the product is negative.
When -2 is raised to an even power, the product is positive.
- c. negative
- -5.4
- $-8\frac{5}{18}$



Section 2.4

Solving Equations Using Addition or Subtraction (pages 74 and 75)

1. Subtraction Property of Equality
5. $a = 19$
13. $g = -10$
21. The 8 should have been subtracted rather than added.
- $$\begin{array}{r} x + 8 = 10 \\ -8 \quad -8 \\ \hline x = 2 \end{array}$$
23. $c + 10 = 3$; $c = -7$
27. $P + 2.54 = 1.38$; $-\$1.16$ million
31. $x + 22.7 = 34.6$; 11.9 ft
33. Because your first jump is higher, your second jump went a farther distance than your first jump.
35. $m + 30.3 + 40.8 = 180$; 108.9°
37. -9
43. -9
3. No, $m = -8$ not -2 in the first equation.
9. $c = 3.6$
17. $q = -\frac{7}{18}$
11. $q = -\frac{1}{6}$
19. $w = -1\frac{13}{24}$
25. $p - 6 = -14$; $p = -8$
29. $x + 8 = 12$; 4 cm
41. -56
45. B



Section 2.5

Solving Equations Using Multiplication or Division (pages 80 and 81)

1. Multiplication is the inverse operation of division, so it can undo division.
3. dividing by 5
7. $h = 5$
15. $p = -8$
23. They should divide by -4.2 .
- $$\begin{array}{r} -4.2x = 21 \\ \frac{-4.2x}{-4.2} = \frac{21}{-4.2} \\ x = -5 \end{array}$$
- 31–33. Sample answers are given.
31. a. $-2x = 4.4$ b. $\frac{x}{1.1} = -2$
35. $-1.26n = -10.08$; 8 days
41. -7
5. multiplying by -8
11. $m = -2$
19. $g = -16$
25. $\frac{2}{5}x = \frac{3}{20}$; $x = \frac{3}{8}$
27. $\frac{x}{-1.5} = 21$; $x = -31.5$
29. $\frac{x}{30} = 12\frac{3}{5}$; 378 ft
13. $x = -8$
21. $f = 6\frac{3}{4}$
33. a. $4x = -5$ b. $\frac{x}{5} = -\frac{1}{4}$
37. -50 ft
43. 12
39. $-5, 5$
45. B

Section 2.6

Solving Two-Step Equations (pages 86 and 87)

- Eliminate the constants on the side with the variable. Then solve for the variable using either division or multiplication.
- D
- $b = -3$
- $g = 4.22$
- $h = -3.5$
- A
- $t = -4$
- $p = 3\frac{1}{2}$
- $y = -6.4$
- Each side should be divided by -3 , not 3 .

$$-3x + 2 = -7$$

$$-3x = -9$$

$$\frac{-3x}{-3} = \frac{-9}{-3}$$

$$x = 3$$

- $a = 1\frac{1}{3}$
- $b = 13\frac{1}{2}$
- $v = -\frac{1}{30}$
- $2.5 + 2.25x = 9.25$; 3 games
- $v = -5$
- $d = -12$
- $m = -9$
- Sample answer:* You travel halfway up a ladder. Then you climb down two feet and are 8 feet above the ground. How long is the ladder? $x = 20$
- the initial fee
- Find the number of insects remaining and then find the number of insects you caught.
- decrease the length by 10 cm; $2(25 + x) + 2(12) = 54$
- $-6\frac{2}{3}$
- 6.2



Section 3.1

Ratios and Rates (pages 102 and 103)

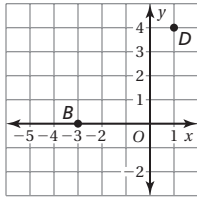
- It has a denominator of 1.
- Sample answer:* A basketball player runs 10 ft down the court in 2 sec.
- \$0.10 per fl oz
- \$72
- 840 MB
- $\frac{5}{9}$
- $\frac{7}{3}$
- $\frac{4}{3}$
- 60 mi/h
- \$2.40 per lb
- 54 words per min
- 90 calories per serving
- 4.5 servings per package
- 4.8 MB per min

29. a. It costs \$122 for 4 tickets.
 b. \$30.50 per ticket
 c. \$305

31. The 9 pack is the best buy at \$2.55 per container.

33. Try searching for “fire hydrant colors.”

35–37.



Section 3.2

Slope (pages 108 and 109)

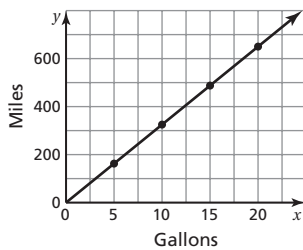
1. yes; Slope is the rate of change of a line.
 3. 5; A ramp with a slope of 5 increases 5 units vertically for every 1 unit horizontally. A ramp with a slope of $\frac{1}{5}$ increases 1 unit vertically for every 5 units horizontally.

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

7. 1

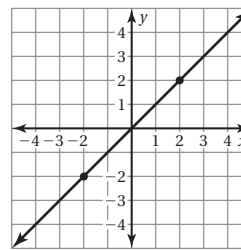
9. $\frac{4}{5}$

11.



slope = 32.5

13.

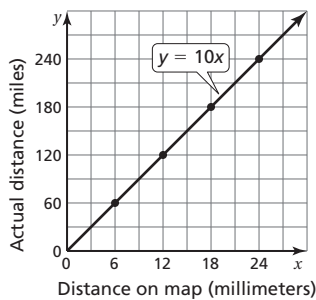


slope = 1

15. The change in y should be in the numerator. The change in x should be in the denominator.

Slope = $\frac{5}{4}$

17. a.



- b. 10; Every millimeter represents 10 miles.
 c. 100 mi
 d. 16 mm

19. $y = 6$

21. $<$

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

25. 3

Section 3.3

Proportions (pages 114 and 115)

- Both ratios are equal.
- yes
- no
- yes
- no
- yes; Both can do 45 sit-ups per minute.
- yes
- yes
- a. J. Nelson b. D. Waechter and K. Gregg
- a. no
- Sample answer:* If the collection has 50 quarters and 30 dimes, when 10 of each coin are added, the new ratio of quarters to dimes is 3 : 2.
- 13
- 18
- D
- Sample answer:* $\frac{6}{10}, \frac{12}{20}$
- no
- yes
- yes; They are both $\frac{4}{5}$.
- no
- yes

Section 3.4

Writing Proportions (pages 120 and 121)

- You can use the columns or the rows of the table to write a proportion.
- Sample answer:* $\frac{x}{12} = \frac{5}{6}$; $x = 10$
- $\frac{x}{50} = \frac{78}{100}$
- $\frac{x}{150} = \frac{96}{100}$
- $\frac{n \text{ winners}}{85 \text{ entries}} = \frac{34 \text{ winners}}{170 \text{ entries}}$
- $\frac{100 \text{ meters}}{x \text{ seconds}} = \frac{200 \text{ meters}}{22.4 \text{ seconds}}$
- $\frac{\$24}{3 \text{ shirts}} = \frac{c}{7 \text{ shirts}}$
- $\frac{5 \text{ 6th grade swimmers}}{16 \text{ swimmers}} = \frac{s \text{ 6th grade swimmers}}{80 \text{ swimmers}}$
- $y = 16$
- $c = 24$
- $g = 14$
- $\frac{1}{200} = \frac{19.5}{x}$; Dimensions for the model are in the numerator and the corresponding dimensions for the actual space shuttle are in the denominator.
- Draw a diagram of the given information.
- $x = 9$
- $x = 140$



Section 3.5

Solving Proportions (pages 126 and 127)

1. mental math; Multiplication Property of Equality; Cross Products Property
3. yes; Both cross products give the equation $3x = 60$.
5. $h = 80$
7. $n = 15$
9. $y = 7\frac{1}{3}$
11. $k = 5.6$
13. $n = 10$
15. $d = 5.76$
17. $m = 20$
19. $d = 15$
21. $k = 5.4$
23. 108 pens
25. $x = 1.5$
27. $k = 4$
29. \$769.50
31. a. 16 mo b. 40 mo
33. Make a table to solve the problem.
35. $2; \frac{1/2}{1/4} = \frac{1}{2} \times \frac{4}{1} = 2$
37. 6400
39. 7920

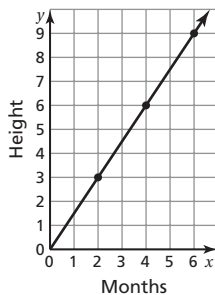


Section 3.6

Converting Measures Between Systems (pages 134 and 135)

1. To convert between measurements, multiply by the ratio of the given relationship such that the desired unit is in the numerator, or set up and solve a proportion using the given relationship as one of the ratios.
3. Find the number of inches in 5 cm; $5 \text{ cm} \approx 1.97 \text{ in.}$; $5 \text{ in.} \approx 12.7 \text{ cm}$
5. >
7. >
9. <
11. 9.5
13. 21.08
15. 3.13
17. 121.92
19. 64.96
21. 2.38
23. 1760 km
25. >
27. >
29. <
31. 72
33. 4.72
35. 77,400 kg
37. A kilometer is shorter than a mile. So, the given speed when converted should be greater than 110.
39. about 3.7 gal

41.



$$\text{slope} = \frac{3}{2}$$

43. C



Section 3.7

Direct Variation (pages 140 and 141)

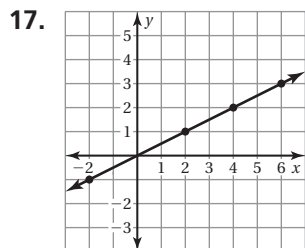
- As one quantity increases, the other quantity increases.
- the second graph; The points do not lie on a line.
- no; The line does not pass through the origin.
- yes; The points lie on a line that passes through the origin.
- no; The line does not pass through the origin.
- yes; The line passes through the origin.
- yes; The equation can be written as $y = kx$.
- yes; The equation can be written as $y = kx$.
- yes
- yes; The equation can be written as $y = kx$.
- no; The equation cannot be written as $y = kx$.
- no; The equation cannot be written as $y = kx$.
- $y = 5x$
- $y = 24x$
- $y = \frac{9}{8}x$
- You can draw the ramp on a coordinate plane and write a direct variation equation.
- no
- Every graph of direct variation is a line; however, all lines are not direct variation because the line must pass through the origin.
- $y = -60$
- $d = -59\frac{1}{2}$



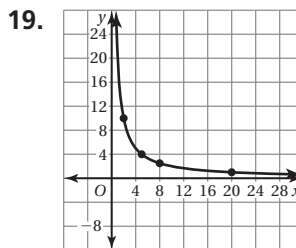
Section 3.8

Inverse Variation (pages 146 and 147)

- As x increases, y decreases.
- Sample answer:* The wingspan of a bird varies inversely with its beat frequency.
- inverse variation; The equation can be written as $y = \frac{k}{x}$.
- direct variation; The equation can be written as $y = kx$.
- neither; The equation cannot be written as $y = kx$ or $y = \frac{k}{x}$.
- direct variation; The equation can be written as $y = kx$.
- inverse variation; The equation can be written as $y = \frac{k}{x}$.
- neither; The equation cannot be written as $y = kx$ or $y = \frac{k}{x}$.



direct variation



inverse variation

21. inverse variation; The equation can be written as $y = \frac{k}{x}$.

23. $y = \frac{4}{x}$

25. a. yes; $t = \frac{12}{s}$ b. 3 h

27. decreases

29. 88

31. 63

33. yes

35. yes

37. B

Section 4.1

The Percent Equation (pages 162 and 163)

1. A part of the whole is equal to a percent times the whole.

3. 55 is 20% of what number?; 275; 11

5. 37.5%

7. 84

9. 64

11. $45 = p \cdot 60$; 75% 13. $a = 0.32 \cdot 25$; 8 15. $12 = 0.005 \cdot w$; 2400 17. $102 = 1.2 \cdot w$; 85

19. 30 represents the part of the whole.

$$30 = 0.6 \cdot w$$

$$50 = w$$

21. \$5400

23. 26 years old

25. 56 signers

27. If the percent is less than 100, the percent of a number is less than the number. If the percent is equal to 100, the percent of a number will equal the number. If the percent is greater than 100, the percent of a number is greater than the number.

29. Remember when writing a proportion that either the units are the same on each side of the proportion, or the numerators have the same units and the denominators have the same units.

31. 92%

33. 0.88

35. 0.36



Section 4.2

Percents of Increase and Decrease (pages 168 and 169)

- If the original amount decreases, the percent of change is a percent of decrease. If the original amount increases, the percent of change is a percent of increase.
- The new amount is now 0.
- decrease; 66.7% 7. increase; 225% 9. decrease; 12.5% 11. decrease; 37.5%
- 10 m 15. 37 points 17. 153 students 19. 42.16 kg
- They should have subtracted 10 in the last step because 25 is decreased by 40%.
 $40\% \text{ of } 25 = 0.4 \cdot 25 = 10$
So, $25 - 10 = 15$.
- increase; 100% 25. increase; 133.3%
- Increasing 20 to 40 is the same as increasing 20 by 20. So, it is a 100% increase. Decreasing 40 to 20 is the same as decreasing 40 by one-half of 40. So, it is a 50% decrease.
- a. 100% increase b. 300% increase
- less than; *Sample answer:* Let x represent the number. A 10% increase is equal to $x + 0.1x$, or $1.1x$. A 10% decrease of this new number is equal to $1.1x - 0.1(1.1x)$, or $0.99x$. Because $0.99x < x$, the result is less than the original number.
- 10 girls 35. 35% 37. 56.25

Section 4.3

Discounts and Markups (pages 176 and 177)

- Sample answer:* Multiply the original price by $100\% - 25\% = 75\%$ to find the sale price.
- a. 6% tax on a discounted price; The discounted price is less, so the tax is less.
b. 30% markup on a \$30 shirt; 30% of \$30 is less than \$30.
- \$35.70 7. \$76.16 9. \$53.33 11. \$450 13. \$172.40 15. 20%
- no; Using the percent of increase $\frac{105 - 60}{60} = 0.75$. So, the markup is 75%.
- \$36
- “Multiply \$45.85 by 0.1” and “Multiply \$45.85 by 0.9, then subtract from \$45.85.” Both will get the sale price of \$4.59. The first method is easier because it is only one step.
- no; \$31.08 25. \$30 27. 180 29. C

Section 4.4

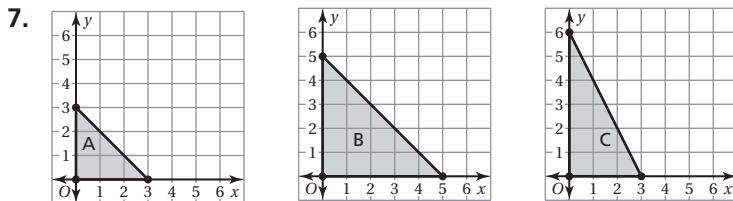
Simple Interest (pages 182 and 183)

- I = simple interest, P = principal, r = annual interest rate (in decimal form), t = time (in years)
- You have to change 6% to a decimal and 8 months to years.
- \$300
 - \$1800
- \$292.50
 - \$2092.50
- \$308.20
 - \$1983.20
- \$1722.24
 - \$6922.24
- 3%
- 4%
- 2 yr
- 1.5 yr
- \$1440
- 2 yr
- \$2720
- \$6700.80
- \$8500
- 5.25%
- 4 yr
- 12.5 yr; Substitute \$2000 for P and I , 0.08 for r , and solve for t .
- Year 1 = \$520; Year 2 = \$540.80; Year 3 = \$562.43
- $n = 5$
- $z = 9$

Section 5.1

Identifying Similar Figures (pages 198 and 199)

- They have the same measure.
- Sample answer:* A photograph of size 3 in. \times 5 in. and another photograph of size 6 in. \times 10 in.
- $\angle A$ and $\angle W$, $\angle B$ and $\angle X$, $\angle C$ and $\angle Y$, $\angle D$ and $\angle Z$;
Side AB and Side WX , Side BC and Side XY , Side CD and Side YZ , Side AD and Side WZ



A and B; Corresponding side lengths are proportional and corresponding angles have the same measure.

- similar; Corresponding angles have the same measure. Because $\frac{4}{6} = \frac{6}{9} = \frac{8}{12}$, the corresponding side lengths are proportional.
- no
- 48°
- 42°
- Simplify the ratios of length to width for each photo to see if any of the photos are similar.
- yes; One could be a trapezoid and the other could be a parallelogram.



- yes
 - yes; This is true for all similar triangles because the height of a triangle is a dimension of the triangle like the side lengths.
- $\frac{16}{81}$
- $\frac{49}{16}$
- B



Section 5.2

Perimeters and Areas of Similar Figures (pages 204 and 205)

- The ratio of the perimeters is equal to the ratio of the corresponding side lengths.
- 120 in.^2 ; Because the ratio of the corresponding side lengths is $\frac{1}{2}$, the ratio of the areas is equal to $\left(\frac{1}{2}\right)^2$. To find the area, solve the proportion $\frac{30}{x} = \frac{1}{4}$.
- $\frac{5}{8}; \frac{25}{64}$
- $\frac{14}{9}; \frac{196}{81}$
- perimeter triples
- Area is 16 times larger.
- 45 in.
- false; $\frac{\text{Area of } \triangle ABC}{\text{Area of } \triangle DEF} = \left(\frac{AB}{DE}\right)^2$
- 39,900%; The ratio of the corresponding lengths is $\frac{6 \text{ in.}}{120 \text{ in.}} = \frac{1}{20}$. So, the ratio of the areas is $\frac{1}{400}$ and the area of the actual merry-go-round is 180,000 square inches. The percent of increase is $\frac{180,000 - 450}{450} = 399 = 39,900\%$.
- $\frac{3}{4}$
- 25% increase
- 42.7% decrease

Section 5.3

Finding Unknown Measures in Similar Figures (pages 210 and 211)

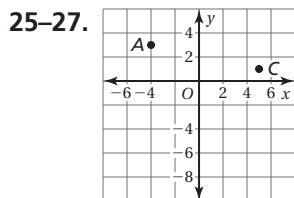
- You can set up a proportion and solve for the unknown measure.
- 15
- 14.4
- 8.4
- 35 ft
- 108 yd
- 3 times
- 12.5 bottles
- 31.75
- 3.88
- 41.63

Section 5.4

Scale Drawings (pages 216 and 217)

- A scale is the ratio that compares the measurements of the drawing or model with the actual measurements. A scale factor is a scale without any units.
 - Convert one of the lengths into the same units as the other length. Then, form the scale and simplify.
 - 10 feet by 10 feet
 - 112.5%
 - 225 mi
 - 175 mi
 - 15 in.
 - 21.6 yd
 - The 5 cm should be in the numerator.
 - 2.4 cm; 1 cm : 10 mm
- $$\frac{1 \text{ cm}}{20 \text{ m}} = \frac{5 \text{ cm}}{x \text{ m}}$$
- $$x = 100 \text{ m}$$

21. a. Answer should include, but is not limited to: Make sure words and picture match the product.
 b. Answers will vary.
23. Find the size of the object that would represent the model of the Sun.



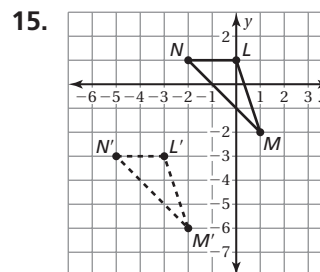
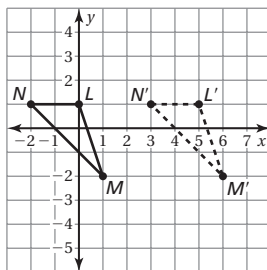
29. C



Section 5.5

Translations (pages 224 and 225)

1. A
 3. yes; Translate the letters T and O to the end.
 5. no
 7. yes
 9. no
 11. $A'(-3, 0)$, $B'(0, -1)$,
 $C'(1, -4)$, $D'(-3, -5)$
 13.



17. 2 units left and 2 units up
 19. 6 units right and 3 units down
 21. a. 5 units right and 1 unit up
 b. no; It would hit Drayton Island.
 c. 4 units right and 4 units up
 23. If you are doing more than 10 moves and have not moved the knight to g5, you might want to start over.
 25. no
 27. yes



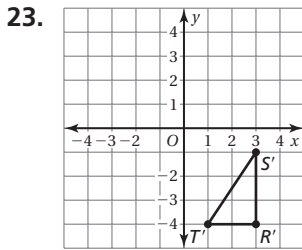
Section 5.6

Reflections (pages 230 and 231)

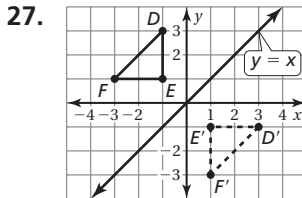
1. The third one because it is not a reflection.
 3. Quadrant IV
 5. yes
 7. no
 9. no
 11. $M'(-2, -1)$, $N'(0, -3)$, $P'(2, -2)$
 13. $D'(-2, 1)$, $E'(0, 2)$, $F'(1, 5)$, $G'(-1, 4)$
 15. $T'(-1, -1)$, $U'(-4, 2)$, $V'(-6, -2)$
 17. $J'(-2, 2)$, $K'(-7, 4)$, $L'(-9, -2)$, $M'(-3, -1)$
 19. x -axis
 21. y -axis

Section 5.6

Reflections (continued) (pages 230 and 231)



25. the first one; The left side of the face is a mirror image of the right side.



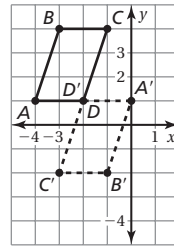
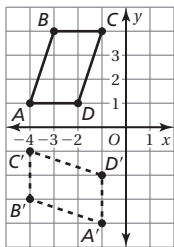
The x -coordinate and y -coordinate for each point are switched in the image.

29. straight 31. acute

Section 5.7

Rotations (pages 236 and 237)

1. a. reflection b. rotation c. translation
 3. Quadrant I 5. Quadrant III 7. No
 9. yes; 180° clockwise or counterclockwise
 11. It only needs to rotate 90° to produce an identical image.
 13. $A'(-1, -4)$, $B'(-4, -3)$,
 $C'(-4, -1)$, $D'(-1, -2)$ 15. $A'(0, 1)$, $B'(-1, -2)$,
 $C'(-3, -2)$, $D'(-2, 1)$



17. because both ways will produce the same image
 19. Use Guess, Check, and Revise to solve this problem.
 21. triangular prism 23. C



Section 6.1

Drawing 3-Dimensional Figures (pages 254 and 255)

1. Prisms and cylinders both have two parallel, identical bases. The bases of a cylinder are circles. The bases of a prism are polygons. A prism has lateral faces that are parallelograms or rectangles. A cylinder has one smooth, round lateral surface.

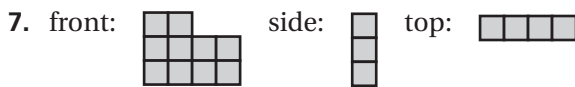
3. *Sample answer:* Prisms: A cereal box is a rectangular prism. A pup tent with parallel triangular bases at the front and back is a triangular prism.

Pyramids: The Egyptian pyramids are rectangular pyramids. A house roof forms a pyramid if it has lateral faces that are triangles that meet at a common vertex.

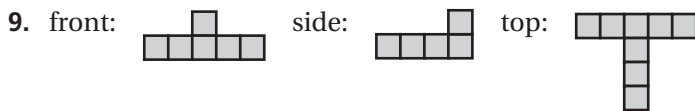
Cylinders: Some examples of cylinders are a soup can, a tuna fish can, and a new, unsharpened, round pencil.

Cones: some examples of cones are a traffic cone, an ice cream sugar cone, a party hat, and the sharpened end of a pencil.

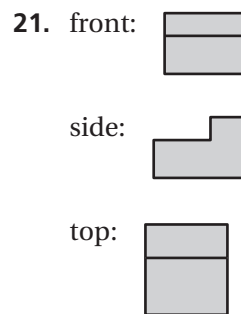
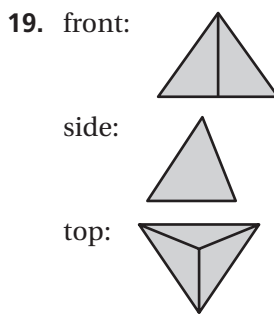
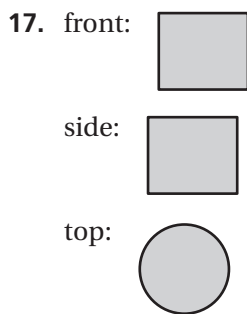
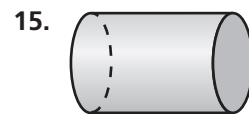
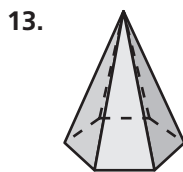
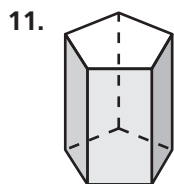
5. base: circle; solid: cylinder



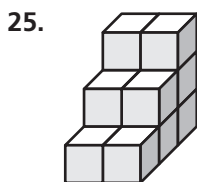
surface area: 34 units^2 ; volume: 10 units^3



surface area: 38 units^2 ; volume: 9 units^3



23. The Washington Monument is made up of a square pyramid sitting at the bottom half of a very tall and narrow square pyramid.



27. Use cubes to create solids that are possible.



29. 28 m^2

31. 15 ft^2

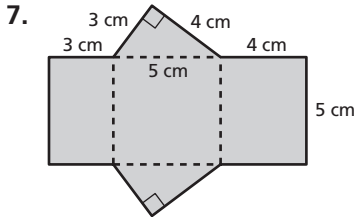
Section 6.2

Surface Areas of Prisms (pages 260 and 261)

1. *Sample answer:* You want to paint a large toy chest in the form of a rectangular prism, and in order to know how much paint to buy, you need to know the surface area.

3. 18 cm^2

5. 108 cm^2



72 cm^2

9. 130 ft^2

11. 76 yd^2

13. 136 m^2

15. 448 in.^2 ; The surface area of the box is 448 square inches, so that is the least amount of paper needed to cover the box.

17. 156 in.^2

19. 83 ft^2

21. 2 qt

23. $S = 2B + Ph$

25. 48 units

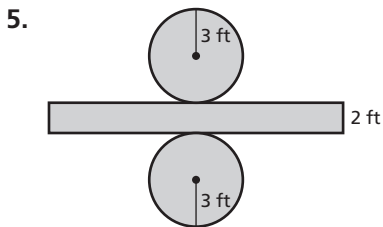
27. C

Section 6.3

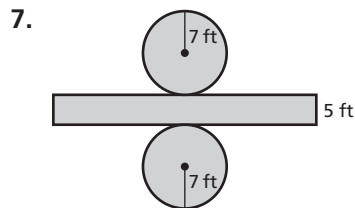
Surface Areas of Cylinders (pages 266 and 267)

1. $2\pi rh$

3. $36\pi \approx 113.0 \text{ cm}^2$



$30\pi \approx 94.2 \text{ ft}^2$



$168\pi \approx 527.5 \text{ ft}^2$

9. $156\pi \approx 489.8 \text{ ft}^2$

11. $120\pi \approx 376.8 \text{ ft}^2$

13. $28\pi \approx 87.9 \text{ m}^2$

15. The error is that only the lateral surface area is found. The areas of the bases should be added;

$$\begin{aligned} S &= 2\pi r^2 + 2\pi rh \\ &= 2\pi(6)^2 + 2\pi(6)(11) \\ &= 72\pi + 132\pi \\ &= 204\pi \text{ ft}^2 \end{aligned}$$

17. The surface area of the cylinder with the height of 8.5 inches is greater than the surface area of the cylinder with the height of 11 inches.

19. After removing the wedge, is there any new surface area added?

21. 117

23. 56.52



Section 6.4

Surface Areas of Pyramids (pages 274 and 275)

- the triangle and the hexagon
- Knowing the slant height helps because it represents the height of the triangle that makes up each lateral face. So, the slant height helps you to find the surface area of each lateral face.
- 178.3 mm² 7. 144 ft² 9. 170.1 yd²
- 1240.4 mm² 13. 6 m
- Determine how long the fabric needs to be so you can cut the fabric most efficiently.
- 124 cm²
- $A \approx 452.16$ units²; $C \approx 75.36$ units
- $A \approx 572.265$ units²; $C \approx 84.78$ units



Section 6.5

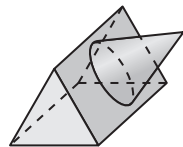
Surface Areas of Cones (pages 280 and 281)

- no; The base of a cone is a circle. A circle is not a polygon.
- $\ell > r$ 5. $36\pi \approx 113.0$ m² 7. $119\pi \approx 373.7$ ft²
- $64\pi \approx 201.0$ yd² 11. 15 cm 13. $130\pi \approx 408.2$ in.²
- $360\pi \approx 1130.4$ in.²; $2.5\pi \approx 7.85$ ft² 17. $96\pi \approx 301.44$ ft²; $\frac{32}{3}\pi \approx 33.49\bar{3}$ yd²
- 12% 21. the lateral surface area
- 45 in.² 25. 16 ft²

Section 6.6

Surface Areas of Composite Solids (pages 286 and 287)

- Sample answer:



- three cylinders
- rectangular prism, half of a cylinder
- cones; $104\pi \approx 326.6$ m²
- trapezoidal prism, rectangular prism; 152 cm² 11. two rectangular prisms; 308 ft²
- 63.4% 15. $144\pi \approx 452.2$ in.² 17. $806\pi \approx 2530.84$ mm²
- 10 ft² 21. 47.5 in.²

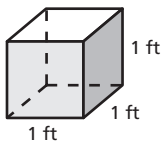
Section 7.1

Volumes of Prisms (pages 302 and 303)

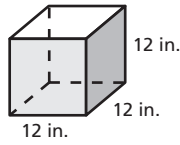
1. cubic units
3. *Sample answers:* Volume because you want to make sure the product will fit inside the package. Surface area because of the cost of packaging.
5. 288 cm^3
7. 160 yd^3
9. 420 mm^3
11. 645 mm^3
13. The area of the base is wrong.
15. 225 in.^3
17. 7200 ft^3

$$V = \frac{1}{2}(7)(5) \cdot 10 \\ = 175 \text{ cm}^3$$

19. 1728 in.^3



$$1 \times 1 \times 1 = 1 \text{ ft}^3$$



$$12 \times 12 \times 12 = 1728 \text{ in.}^3$$

25. reflection
27. rotation

21. 20 cm

23. You can convert the volume of the tank to cubic feet, so it is easier to find the dimensions.



Section 7.2

Volumes of Cylinders (pages 308 and 309)

1. How much does it take to cover the cylinder?; $170\pi \approx 533.8 \text{ cm}^2$; $300\pi \approx 942 \text{ cm}^3$
3. $486\pi \approx 1526.0 \text{ ft}^3$
5. $245\pi \approx 769.3 \text{ ft}^3$
7. $90\pi \approx 282.6 \text{ mm}^3$
9. $63\pi \approx 197.8 \text{ in.}^3$
11. $256\pi \approx 803.8 \text{ cm}^3$
13. $\frac{125}{8\pi} \approx 5 \text{ ft}$
15. $\frac{240}{\pi} \approx 76 \text{ cm}$
17. Divide the volume of one round bale by the volume of one square bale.
19. $8325 - 729\pi \approx 6036 \text{ m}^3$
21. $a = 0.5 \cdot 200$; 100
23. D



Section 7.3

Volumes of Pyramids (pages 314 and 315)

1. The volume of a pyramid is $\frac{1}{3}$ times the area of the base times the height. The volume of a prism is the area of the base times the height.
3. 3 times greater
5. 20 mm^3
7. 80 in.^3
9. 252 mm^3
11. 700 mm^3
13. 30 in.^2
15. 7.5 ft

Section 7.6

Surface Areas and Volumes of Similar Solids (pages 335–337)

- Similar solids are solids of the same type that have proportional corresponding linear measures.
- a. $\frac{4}{9}$ b. $\frac{8}{27}$
- no
- no
- $b = 18$ m; $c = 19.5$ m; $h = 9$ m
- 1012.5 in.²
- $13,564.8$ ft³
- 673.75 cm²
- a. yes; Because all circles are similar, the slant height and the circumference of the base of the cones are proportional.
b. no; because the ratio of the volumes of similar solids is equal to the cube of the ratio of their linear measures
- Choose two variables, one to represent the surface area of the smallest doll and one to represent the volume of the smallest doll. Use these variables to find the surface areas and volumes of the other dolls.
- 1
- C



Section 8.1

Stem-and-Leaf Plots (pages 352 and 353)

- 3 is the stem; 4 is the leaf
- From the leaves, you can see where most of the data lies and whether there are many values that are low or high.
- 4; 42
- no; There is no 2 as a leaf for the stem 3.

9. Hours Online

Stem	Leaf
0	0 2 6 8
1	2 2 4 5 7 8
2	1 4

Key: 2 | 1 = 21 hours

11. Points Scored

Stem	Leaf
3	8
4	2 2 3 3 5
5	0 1 6 8 8
6	
7	0 1 1 5

Key: 3 | 8 = 38 points

13. Weights

Stem	Leaf
0	8
1	2 5 7 8
2	4 4
3	1

Key: 2 | 4 = 24 pounds

Most of the weights are in the middle.

15. Minutes in Line

Stem	Leaf
1	6 9
2	0 2 6 7 9
3	1 1 6 8
4	0

Key: 4 | 0 = 4.0 minutes

- mean: 56.6; median: 53; mode: 41, 43, 63; range: 56

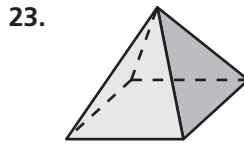
- 97; It increases the mean.

21. *Sample answer:* Points by a basketball player in his first 8 games

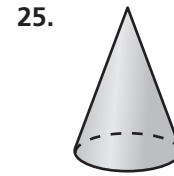
Points

Stem	Leaf
2	1 3 4
3	2 4
4	0 1 5

Key: 3 | 2 = 32 points



27. B



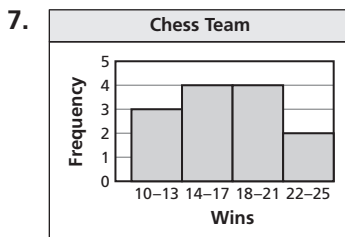
Section 8.2

Histograms (pages 358 and 359)

1. The *Test Scores* graph is a histogram because the number of students (frequency) achieving the test scores are shown in intervals of the same size (20).

3. No bar is shown on that interval.

5. flat



9. a. 4-5

b. 20 students

c. 85%

11. Florida has the greater area because the intervals represent much greater areas in terms of square miles. Also, notice that all of the data for Indiana would fit in one interval in the Florida graph.

13. Don't use a smaller interval because the distribution will appear flat.

15. 27 17. 51.2



Section 8.3

Circle Graphs (pages 366 and 367)

1. Multiply the decimal form of each percent by 360° to find the angle measure for each section.

3. $\frac{1}{2}$ does not belong because it does not represent an entire circle.

5. orange

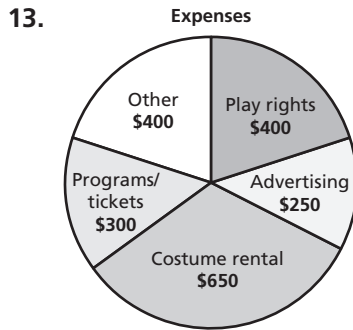
7. 20 students

9. 54°

11. 10.8°

Section 8.3

Circle Graphs (continued) (pages 366 and 367)



15. no; The sum of the percentages is greater than 100%. This would occur when students like more than one of these activities.

17. *Sample answer:* Knowledge of percentages, proportions, and degrees of a circle. How to convert from one form to another.

19. $x = 40$

21. $w = 1.5$

Section 8.4

Samples and Populations (pages 372 and 373)

1. Samples are easier to obtain.
3. *Sample answer:* The results may be similar for middle school students, but not for children in first grade. Children in first grade probably do not know all of these nuts.
5. *Sample answer:* You could send a survey home with your classmates and have them ask one of their parents what their favorite nut is.
7. Population: All quarters in circulation
Sample: 150 quarters
9. Population: All books in library
Sample: 10 books
11. a. Population: All students at your school
Sample: First 15 students at band class
b. no; Your sample includes 15 students arriving at band class, and students who take band class play a musical instrument.
13. Sample A because it is representative of the population.
15. A population because there are few enough students in your homeroom to not make the surveying difficult.
17. 1260 students
19. Use the survey results to find the number of students in the school that plan to attend college.
21. 31.25%
23. $81.\overline{81}\%$



Section 9.1

Introduction to Probability (pages 388 and 389)

1. event; It is a collection of several outcomes.
3. *Sample answer:* flipping a coin and getting both heads and tails; rolling a number cube and getting a number between 1 and 6
5. no; They both have the same number of forward outcomes.
7. 6
9. 6, 7, 8, 9
11. 1, 2
13. a. 2 ways b. blue, blue
15. a. 2 ways b. purple, purple
17. a. 6 ways b. yellow, green, blue, blue, purple, purple
19. There are 7 marbles that are *not* purple, even though there are only 4 colors. Choosing *not* purple could be red, red, red, blue, blue, green, or yellow.
21. false; five
23. false; red
25. no; More sections on a spinner does not necessarily mean you are more likely to spin red. It depends on the size of the sections of the spinner.
27. Do the number of outcomes increase, decrease, or stay the same?
29. 30
31. $-3\frac{1}{2}$



Section 9.2

Theoretical Probability (pages 394 and 395)

1. There is a 50% chance you will get a favorable outcome.
3. Spinner 4; The other three spinners are fair.
5. $\frac{1}{6}$, or about 16.7%
7. $\frac{1}{2}$ or 50%
9. 0 or 0%
11. 9 chips
13. not fair, your friend
15. $\frac{1}{44}$ or about 2.3%
17. a. $\frac{4}{9}$ or about 44.4% b. 5 males
19. There are 2 combinations for each.
21. $\frac{1}{4}$
23. $-\frac{21}{40}$
25. C

Section 9.3

Experimental Probability (pages 402 and 403)

1. Perform an experiment several times. Count how often the event occurs and divide by the number of trials.
3. $\frac{2}{5}$ or 40%
5. $\frac{2}{5}$ or 40%
7. $\frac{7}{50}$ or 14%
9. $\frac{21}{25}$ or 84%
11. $\frac{17}{50}$ or 34%
13. The theoretical probability was found, not the experimental probability. $P(4) = \frac{11}{50}$
15. 45 tiles
17. 30
19. The experimental probability of 60% is close to the theoretical probability of 50%.
21. Make a list of all the possible ways to get each sum.
23. *Sample answer:* Roll two number cubes 50 times and find each product. Record how many times the product is at least 12. Divide this number by 50 to find the experimental probability.
25. $x = 5$
27. $x = 24$



Section 9.4

Independent and Dependent Events (pages 409–411)

1. Draw a tree diagram or multiply $P(A)$ by $P(B)$.
3. *Sample answer:* independent events: a traffic jam and a sunny day; dependent events: temperatures below freezing and ice
5. independent; The outcome of the first roll does not affect the outcome of the second roll.
7. independent; You replace the marble, so the probability doesn't change.
9. dependent; There is one less person to choose from on the second draw.
11. $\frac{2}{9}$
13. $\frac{2}{9}$
15. $\frac{1}{20}$ or 5%
17. $\frac{3}{20}$ or 15%
19. $\frac{1}{42}$ or about 2.4%
21. $\frac{1}{21}$ or about 4.8%
23. $\frac{4}{21}$ or about 19%
25. $\frac{1}{2520}$ or about 0.04%
27. a. $\frac{1}{100}$ or 1%
b. It increases the probability that your choice is correct to $\frac{1}{25}$ or 4%, because each digit could be 0, 2, 4, 6, or 8.
29. a. $\frac{1}{9}$ or about 11.1%
b. It increases the probability that your guesses are correct to $\frac{1}{4}$, or 25%, because you are only choosing between 2 choices for each question.
31. $\frac{16}{25}$ or 64%
33. 1 : 5; 5 : 1
35. 1 : 35; 35 : 1
37. $n = -10.8$
39. B

Section B.1

Solving Multi-Step Equations (pages A14 and A15)

1. Add $6x$ and $3x$, subtract 2 from each side, and divide each side by 9.
3. 313 K
5. $K = C + 273$
7. $x = 3$
9. $m = -4$
11. $y = 3$
13. 15
15. a. \$7.25 b. \$1.75
17. The question asks for the sale price of the skirt, not the original price of the skirt.
19. $x = 12$; *Sample answer:* The left side has more steps, but does not deal with fractions like the right side does.
21. 12



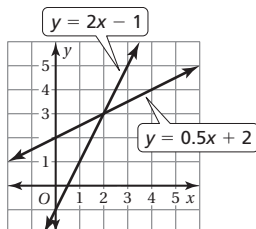
Section B.2

Solving Equations with Variables on Both Sides (pages A20 and A21)

1. Subtract $3x$ from each side and divide each side by 2.
3. Add $3x$ to each side so the constant is by itself.
5. $c = -3$
7. $a = -\frac{1}{2}$
9. $z = -2$
11. $p = -8\frac{1}{2}$
13. $d = -2$
15. $h = 2\frac{1}{2}$
17. $k = -6$
19. $f = -2\frac{2}{7}$
21. $b = 1$
23. They did not distribute the negative sign on the right side.
$$2(v - 5) = -(3v + 5)$$
$$2v - 10 = -3v - 5$$
$$5v = 5$$
$$v = 1$$
25. 27
27. 18
29. $5n - 3 = 8 - 6n; n = 1$
31. Use $d = rt$ and the fact that the distance is the same to write an equation with variables on both sides.
33. perimeter of $\triangle ABC$: 27; perimeter of $\triangle DEF$: 45



35–37.



Section B.3

Solving Equations Using Tables and Graphs (pages A26 and A27)

- $3x - 2 = x + 2; x = 2$
- Sample answer:* A table because graphs have to be accurate to find the point of intersection.
- $h = 2$ 7. $g = 5$ 9. $a = -2$ 11. $p = -3$
- $x = -3$ 13. $x = -2$ 15. 3 months 17. $x = 16; P = 24$ units
- Sample answer:* From the table, you can see that the solution is between 2 and 3. Then, you can use *Guess, Check, and Revise* to find the solution, which is 2.2.
- Use $d = rt$ and the fact that both of you will have travelled the same distance when your friend catches you to write an equation with variables on both sides.
- triangle: 27 square units; rectangle: 54 square units
- $\frac{1}{2}$ 27. B



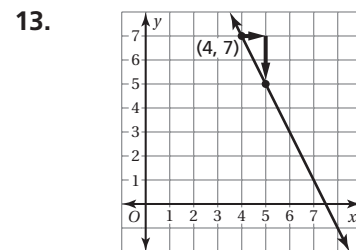
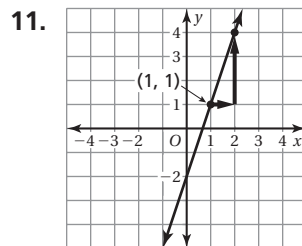
Section B.4

Slope of a Line (pages A34 and A35)

- Sample answer:* The rise is the difference of the distance from the ground to the peak of the roof and the distance from the ground to the lowest point on the roof. The run is the horizontal distance from the peak to the lowest point on the roof. The slope is the ratio of the rise to the run.
- Sample answer:* (5, -8), (-1, -4)

	Two Points	Change in y	Change in x	Slope of Line
5.	(-10, 4), (5, -20)	-24	15	$-\frac{8}{5}$
7.	(1, 9), (7, 6)	-3	6	$-\frac{1}{2}$

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



15. (-3, -7)

17. a. Daytona: $\frac{21}{34}$; Talladega: $\frac{13}{20}$

b. Talladega Superspeedway

c. *Sample answer:* So they can maintain a high speed through turns.

19. In part (b), you can change the height or the length of the roadway.

21. $x = -4$

23. $x = 7$



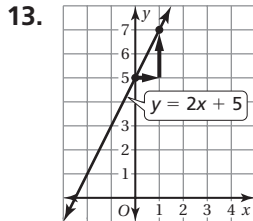
Section B.5

Linear Functions (pages A40 and A41)

1. the y -coordinate of the point where the line crosses the y -axis

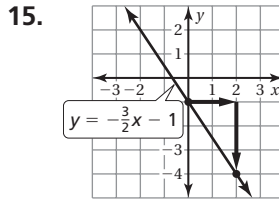
3. B

7. slope: -2 ; y -intercept: 6

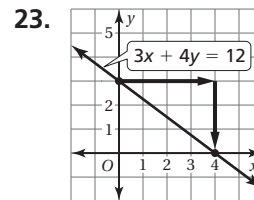
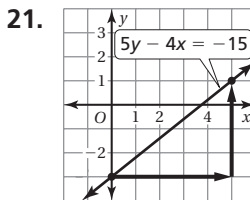
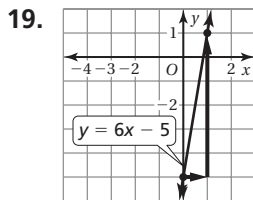
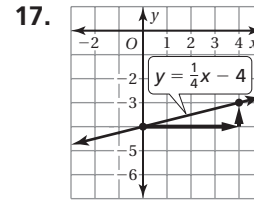


5. A

9. slope: -5 ; y -intercept: 3



11. slope: $\frac{5}{2}$; y -intercept: -9



25. the number of cartoons the cartoonist has already completed

27. $y = -3x + 2$

29. a. slope: 2; y -intercept: 7

c. no; The value of y is 5 when $x = -1$.
The value of x cannot be negative because the side length of a rectangle is never negative.

31. slope: $-\frac{A}{B}$, y -intercept: $\frac{C}{B}$

33. $v = \frac{1}{2}$

35. A

