Selected Answers

Section 1.1 Evaluating Algebraic Expressions *(pages 6 and 7)*

1.

Algebraic Expression	Numbers	Variables	Operations
$x - 8$	8	x	Subtraction
$3w + 9$	3, 9	w	Multiplication and addition
$6y - 12$	6, 12	y	Multiplication and subtraction

3. smaller; When you subtract larger and larger values from 20, you will have less and less left.

5. \$120 **7.** \$8

9. 10 **11.** 9

13. 17 **15.** 2

17. 9 **19.** 24 **21.** \$15; \$105

23.

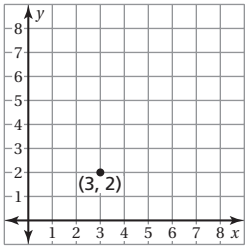
x	3	6	9
$x \cdot 8$	24	48	72

25. 23 **27.** 6 **29.** 22

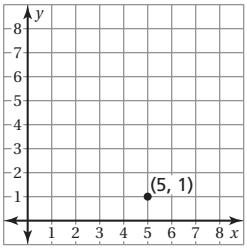
31. 46 **33.** 24

35. What shape could have an area of 128 square feet? What shape could have an area of s^2 square feet?

37.



39.



41. C

Section 1.2 Writing Expressions *(pages 12 and 13)*

1. x take away 12; $x - 12$; $x + 12$ **3.** $8 - 5$ **5.** $28 \div 7$

7. $18 - 3$ **9.** $x - 13$ **11.** $18 \div a$

13. $7 + w$ or $w + 7$ **15.** $y + 4$ or $4 + y$ **17.** $2 \cdot z$ or $z \cdot 2$

19. The expression is not written in the correct order; $\frac{8}{y}$

21. **a.** $x \div 5$

b. *Sample answer:* If the total cost is \$30, then the cost per person is $x \div 5 = 30 \div 5 = \$6$. The result is reasonable.

23–25. Sample answers are given.

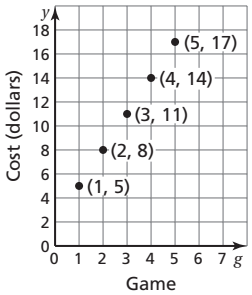
23. The sum of n and 6; 6 more than a number n **25.** A number b less than 15; 15 take away a number b

27. $\frac{y}{4} - 3$; 2 **29.** $8x + 6$; 46

31. a.

Game	1	2	3	4	5
Cost	$5	$8	$11	$14	$17

b.



c. $2 + 3g$

d. $26

33. It might help to see the pattern if you make a table of the data in the bar graph.

35. $\frac{x}{4}$ **37.** 59

39. 140

Section 1.3 Properties of Addition and Multiplication

(pages 18 and 19)

1. *Sample answer:* $\frac{1}{5} + \frac{3}{5} = \frac{3}{5} + \frac{1}{5}$

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

3. *Sample answer:* $(5 \cdot x) \cdot 1 = 5 \cdot (x \cdot 1)$

$= 5x$

5. Comm. Prop. of Mult. **7.** Assoc. Prop. of Mult. **9.** Add. Prop. of Zero

11. The grouping of the numbers did not change. The statement illustrates the Commutative Property of Addition because the order of the addends changed.

13. $(14 + y) + 3 = (y + 14) + 3$ Comm. Prop. of Add.

$= y + (14 + 3)$ Assoc. Prop. of Add.

$= y + 17$ Add 14 and 3.

15. $7(9w) = (7 \cdot 9)w$ Assoc. Prop. of Mult.

$= 63w$ Multiply 7 and 9.

17. $(0 + a) + 8 = a + 8$ Add. Prop. of Zero

19. $(18.6 \cdot d) \cdot 1 = 18.6 \cdot (d \cdot 1)$ Assoc. Prop. of Mult.

$= 18.6d$ Mult. Prop. of One

21. $(2.4 + 4n) + 9 = (4n + 2.4) + 9$ Comm. Prop. of Add.

$= 4n + (2.4 + 9)$ Assoc. Prop. of Add.

$= 4n + 11.4$ Add 2.4 and 9.

23. $z \cdot 0 \cdot 12 = (z \cdot 0) \cdot 12$ Assoc. Prop. of Mult.

$= 0 \cdot 12$ Mult. Prop. of Zero

$= 0$ Mult. Prop. of Zero

25. a. x represents the cost of a box of cookies. **b.** $120x$

27. $7 + (x + 5) = x + 12$ **29.** $(7 \cdot 2) \cdot y$ **31.** $(17 + 6) + 2x$

33. $w \cdot 16$ **35.** 98 **37.** 90

39. 37 is already prime. **41.** 3×7^2 **43.** B

Selected Answers

Section 1.4 The Distributive Property
(pages 26 and 27)

1. *Sample answer:* You must distribute or give the number outside the parentheses to the numbers inside the parentheses.

3. $4 + (x \cdot 4)$ does not belong because it doesn't represent the Distributive Property.

5. 684 **7.** 440 **9.** 216 **11.** 196 **13.** $10b - 60$

15. $56 + 7y$ **17.** $9n + 9$ **19.** $18w + 90$ **21.** $70 + 7x$ **23.** $78 + 6z$

25. $29 + 8x$ **27.** $5x + 52$

29. **a.** $30(8 + x) = 240 + 30x$
b. *Sample answer:* \$2; It is less than the regular price to the exhibit.
c. *Sample answer:* \$300; yes

31. $10(103 - x) = 1030 - 10x$ **33.** $13(7 - x) = 91 - 13x$

35. $x = 8$ **37.** $x = 3$

39. $2(3 + x)$ **41.** $7(1 + 2x + 3)$

43. The expression for the profit will contain an expression for the large candles and an expression for the small candles.

45. 14 **47.** 120

49. no; $\frac{2}{3}$ **51.** no; $\frac{19}{31}$

53. C

Section 1.5 Using Formulas to Solve Problems
(pages 32 and 33)

1. *Sample answer:* You substitute value(s) for the variable(s) to find the value of the formula.

3. 48 in.^{2} **5.** 108 in.^{2} **7.** 30 ft^2

9. **a.** 234 ft^2 **b.**

c. 26 ft; The base of the parking space is related to the length of the car.

11. **a.** 192 in.^{3} **b.** almost 13 bowls

13. $4x - 9$ **15.** $32x - 40 - x^2$

17. 24 karats; If you let $k = 24$, then $P = 100$.

19. Area of black = 252 in.^{2}
Area of yellow = 244 in.^{2}
Area of each blue stripe = 328 in.^{2}

21. $\frac{1}{2}$ **23.** 1

Section 2.1 Fractions and Estimation
(pages 48 and 49)

1. rounding; The product will be easier to compute.

3. rounding; The product will be easier to compute.

5.

How to Round	Estimate
Round 77 to the nearest hundred.	$100 \div 4 = 25$
Round 77 to the nearest ten.	$80 \div 4 = 20$
Round 77 to the nearest compatible number.	$76 \div 4 = 19$

7. 0 **9.** 0

11. $\frac{1}{2}$ **13.** $\frac{1}{3}$

15. $\frac{1}{2}$ **17.** $\frac{1}{2}$

19. 27 **21.** 6

23. $\frac{5}{12}$ is closer to $\frac{1}{2}$ than to 0. $\frac{5}{12} \times \frac{9}{10} \approx \frac{1}{2} \times 1 = \frac{1}{2}$

25. 8 **27.** 203 **29.** 7 **31.** 20

33. Which operation should you use?

35. 27 in.^{2}; underestimate

37. 18 **39.** 5

41. *Sample answer:* low estimate: 234 in.^{2}; high estimate: 320 in.^{2}
To find a low estimate, round the dimensions down.
To find a high estimate, round the dimensions up.

43. 36 **45.** $4\frac{1}{2}$

Section 2.2 Multiplying Fractions and Whole Numbers
(pages 54 and 55)

1. Multiply the numerator of the fraction by the whole number. Then write the product over the denominator.

3. $\frac{1}{3} \times 24$; because $\frac{1}{3} > \frac{1}{4}$

5. $\frac{5}{8}$ **7.** $1\frac{7}{9}$ **9.** 15 **11.** $17\frac{1}{2}$

13. $2\frac{1}{10}$ **15.** 26 **17.** 9 **19.** $13\frac{1}{2}$

21. 9 should be multiplied by 3, not 7. $9 \times \frac{3}{7} = \frac{9 \times 3}{7} = \frac{27}{7}$, or $3\frac{6}{7}$

23. $2\frac{2}{3}$ cups **25.** 6 **27.** 20

29. Multiply $25 \times \frac{2}{5}$ first by the Comm. Prop. of Mult.; 60

31. Multiply $\frac{3}{7} \times 14$ first by the Comm. Prop. of Mult.; 78

Section 2.2 Multiplying Fractions and Whole Numbers *(continued)* *(pages 54 and 55)*

33. $1\frac{1}{2}$ **35.** $2\frac{2}{3}$ **37.** $22\frac{1}{2}$ **39.** $4\frac{1}{6}$

41. yes; If you have more money than your friend, then $\frac{1}{3}$ of your money could be greater than $\frac{1}{2}$ of your friend's money.

43. $1\frac{7}{8}$ **45.** $\frac{32}{175}$ **47.** D

Section 2.3 Multiplying Fractions *(pages 60 and 61)*

1. Multiply numerators and multiply denominators, then simplify the fraction.

3. 4 **5.** $\frac{2}{21}$ **7.** $\frac{1}{10}$ **9.** $\frac{8}{15}$ **11.** $\frac{1}{24}$

13. $4\frac{1}{6}$ **15.** $\frac{2}{5}$ **17.** $\frac{9}{49}$ **19.** $\frac{13}{21}$

21. You did not multiply the denominators. $\frac{2}{5} \times \frac{3}{10} = \frac{2 \times 3}{5 \times 10} = \frac{{}^{1}\cancel{2} \times 3}{5 \times \cancel{10}_{5}} = \frac{3}{25}$

23. $\frac{1}{4}$ **25.** $\frac{2}{21}$ **27.** $\frac{3}{10}$ **29.** $\frac{7}{10}$ **31.** $\frac{21}{40}$

33. $\frac{9}{80}$ **35.** $\frac{7}{45}$ **37.** $\frac{27}{125}$ **39.** $\frac{25}{196}$

41. $\left(\frac{5}{8} \times \frac{22}{15}\right) > \frac{5}{8}$; Because $\frac{22}{15} > 1$, the product will be greater than $\frac{5}{8}$.

43. *Sample answer:* $\frac{1}{3}$ **45.** **a.** $\frac{3}{50}$ **b.** 45 people

47. $\frac{35}{8}$ **49.** $\frac{23}{6}$

Section 2.4 Multiplying Mixed Numbers *(pages 66 and 67)*

1. a fraction with a numerator that is greater than or equal to the denominator

3. *Sample answer:* $3\frac{1}{2} \times 3\frac{1}{7} = 11$

5. 2 **7.** $\frac{3}{4}$ **9.** 2 **11.** 2 **13.** 2

15. $1\frac{1}{2}$ **17.** $1\frac{3}{14}$ **19.** $36\frac{2}{3}$ **21.** $6\frac{4}{9}$ **23.** $11\frac{3}{8}$

25. You must first rewrite the mixed numbers as improper fractions and then multiply.

$$2\frac{1}{2} \times 7\frac{4}{5} = \frac{5}{2} \times \frac{39}{5}$$
$$= \frac{{}^{1}\cancel{5} \times 39}{2 \times \cancel{5}_{1}}$$
$$= \frac{39}{2}, \text{ or } 19\frac{1}{2}$$

27. **a.** 7 ft^2 **b.** $10\frac{1}{3} \text{ ft}^2$

29. $13\frac{3}{4}$ **31.** $8\frac{13}{24}$ **33.** 155 **35.** $26\frac{2}{5}$

37. No; Positive mixed numbers are greater than 1 and the product of two numbers greater than 1 is always greater than 1.

39. **a.** $5\frac{1}{10}$ hours **b.** 11:39 A.M.

41. $\frac{1}{6}$ **43.** $\frac{7}{36}$ **45.** $9x - 27$ **47.** $12x - 96$

Section 2.5 Dividing Fractions *(pages 75–77)*

1. *Sample answer:* $\frac{2}{5}, \frac{5}{2}$ **3.** B **5.** A

7. $\frac{1}{8}$ **9.** $\frac{5}{2}$ **11.** $\frac{1}{2}$ **13.** 16 **15.** $\frac{1}{14}$

17. $\frac{1}{3}$ **19.** 3 **21.** $\frac{2}{27}$ **23.** $\frac{27}{28}$ **25.** $20\frac{1}{4}$

27. You need to invert the second fraction before you multiply.

$$\frac{4}{7} \div \frac{13}{28} = \frac{4}{7} \times \frac{28}{13} = \frac{4 \times \cancel{28}^{4}}{\cancel{7}_{1} \times 13} = \frac{16}{13}, \text{ or } 1\frac{3}{13}$$

29. Round $\frac{2}{5}$ to $\frac{1}{2}$ and $\frac{8}{9}$ to 1. $\frac{1}{2} \div 1 = \frac{1}{2}$, which is not close to the incorrect answer of $\frac{20}{9}$.

31. $5\frac{5}{8}$ times **33.** $\frac{5}{16}$ **35.** $2\frac{1}{2}$ **37.** yes **39.** yes **41.** $\frac{1}{3}$

43. >; When you divide a number by a fraction less than 1, the quotient is larger than the number.

45. >; When you divide a number by a fraction less than 1, the quotient is larger than the number.

47. $\frac{1}{216}$ **49.** $1\frac{1}{6}$ **51.** 2 **53.** $\frac{3}{26}$ **55.** $\frac{2}{3}$

57. when the fraction has, or can be simplified to have, a 1 in the numerator; The reciprocal will have, or can be simplified to have, a 1 in the denominator, so it is a whole number.

59. It might help to make a table to find how many bowls and plates you can glaze so there is no glaze left over.

61. 3 **63.** 10 **65.** C

Section 2.6 Dividing Mixed Numbers
(pages 82 and 83)

1. $\frac{3}{22}$

3. sometimes; The reciprocal of $\frac{2}{2}$ is $\frac{2}{2}$, which is improper.

5. 3

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

9. $3\frac{18}{19}$

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

13. $12\frac{1}{2}$

15. $1\frac{1}{5}$

17. $\frac{2}{7}$

19. $1\frac{5}{18}$

21. The mixed number $1\frac{2}{3}$ was not written as an improper fraction before inverting.

$$3\frac{1}{2} \div 1\frac{2}{3} = \frac{7}{2} \div \frac{5}{3}$$
$$= \frac{7}{2} \times \frac{3}{5}$$
$$= \frac{7 \times 3}{2 \times 5}$$
$$= \frac{21}{10}, \text{ or } 2\frac{1}{10}$$

23. 14 hamburgers

25. $\frac{8}{15}$

27. $\frac{22}{27}$

29. $1\frac{1}{3}$

31. $5\frac{1}{6}$

33. $\frac{7}{54}$

35. $12\frac{1}{2}$

37. $\frac{22}{35}$

39. **a.** 6 ramps; *Sample answer:* The estimate is reasonable because $12\frac{1}{2}$ was rounded down.

b. 6 ramps; $1\frac{1}{4}$ feet left over

41. 0.43

43. 3.8

45. C

Section 2.7 Writing Decimals as Fractions
(pages 88 and 89)

1. *Sample answer:* $0.3 = \frac{3}{10}$

3. $6\frac{7}{10}$

5. $7\frac{9}{10}$

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

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

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

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

15. $\frac{11}{100}$

17. $\frac{87}{200}$

19. $2\frac{3}{4}$

21. $8\frac{113}{1000}$

23. Because 3 is in the thousandths' place, the denominator should be 1000. $0.073 = \frac{73}{1000}$

25. $2\frac{3}{10}$ hours

27. $\frac{36}{5}$

29. $\frac{341}{50}$

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

33. $\frac{138}{25}$

35. 0.05; $\frac{1}{20}$

37. 0.08; $\frac{2}{25}$

39. 0.32; $\frac{8}{25}$

41. 0.55; $\frac{11}{20}$

43. It may help to organize the information in a table.

45. 5

47. 17

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

51. $\frac{2}{7}$

53. B

Section 2.8

Writing Fractions as Decimals

(pages 94 and 95)

1. When the remainder is 0 or the decimal begins repeating

3. terminating **5.** repeating **7.** $0.\overline{1}$ **9.** $0.5\overline{3}$

11. 0.7 **13.** 0.62 **15.** $0.9\overline{4}$ **17.** 0.84

19. 0.15 **21.** 0.375 **23.** $0.6\overline{3}$ **25.** 4.56

27. The digit 5 does not repeat; $\frac{8}{15} = 0.5\overline{3}$.

29. $0.7\overline{3}$ **31.** > **33.** $\frac{5}{8}$; 0.625 **35.** $\frac{9}{14}$, $0.6\overline{428571}$

37. *Sample answer:* $\frac{3}{5}$; 0.6

39. **a.** $\frac{3}{9} = 0.333\ldots$; $\frac{4}{9} = 0.444\ldots$; $\frac{5}{9} = 0.555\ldots$; $\frac{6}{9} = 0.666\ldots$;

$\frac{7}{9} = 0.777\ldots$; $\frac{8}{9} = 0.888\ldots$; $\frac{9}{9} = 0.999\ldots$

b. 1; $\frac{9}{9} = 1$

41. $0.00\overline{345}$ **43.** 0.00125125 **45.** 7 **47.** 12

Section 3.1

Decimals and Estimation

(pages 110 and 111)

1. *Sample answer:* You use an estimate to approximate the price of an item after a 25% discount.

3. $3.9 \div 1.1$, $7\frac{3}{5} \div 1\frac{7}{8}$, $11.3 \div 2.9$

5. Compatible numbers, because rounding does not give numbers that are easy to use.

7. Rounding, because it gives numbers that are easy to use.

9. 21 **11.** 25 **13.** 30 **15.** 90

17. 27 **19.** 9 **21.** 72 **23.** 2

25–39. Sample answers are given.

25. 600 **27.** 6 **29.** 450 **31.** 6

33. 320 lb; too much **35.** 35 m^2 **37.** 96 ft^2 **39.** 36

41. The calories burned in the table are for five minutes, not one minute.

43. *Sample answer:* Your cousins, from out of town, leave at 9:00 A.M. to visit you. To be sure you are home when they arrive, you underestimate their travel time.

45. 192 **47.** 195 **49.** 8.92 **51.** 10.004

Selected Answers

Section 3.2 Multiplying Decimals and Whole Numbers
(pages 116 and 117)

1. 4; The decimal factor has 4 decimal places. **3.** 7.6 is how much more than 3?; 4.6; 22.8

5. 5.6 **7.** 40.3 **9.** 54.9 **11.** 22.29 **13.** 47.5 **15.** 2.48

17. 31.5 **19.** 18.27 **21.** 29.45 **23.** 98.256 **25.** 0.091 **27.** 0.085

29. 0.076 **31.** 0.0558

33. The decimal is in the wrong place. $0.32 \times 5 = 1.60$

35. 8.75 ft **37.** 28.3 **39.** 9670 **41.** $5x + 1.55$

43. $7b + 0.364$ **45.** $12w + 0.0264$ **47.** 28.4 **49.** 282.24

51. $7.12 \times 8.22 \times 100 = 7.12 \times 822 = 5852.64$

53. *Answers should include, but are not limited to:*

a. menu with main items, desserts, beverages, and prices

b. guest check for 5 people showing items, prices, and subtotal

c. tax and total with tax are shown

d. amount rounded to nearest dollar, 20% tip, and total amount paid are shown

55. 18,272 **57.** 47,107

Section 3.3 Multiplying Decimals
(pages 122 and 123)

1. Place the decimal point so that there are two decimal places. $1.2 \times 2.4 = 2.88$

3. 6.2832 **5.** 3 **7.** 5 **9.** 0.024 **11.** 0.000072 **13.** 0.03

15. 0.000012 **17.** 109.74 **19.** 3.886 **21.** 7.677824 **23.** 51.358363 **25.** $3.24

27. $741.79 **29.** 0.576 **31.** 0.0222 **33.** 0.2664 **35.** 6.2

37. Each number is 0.1 times the previous number; 0.0015, 0.00015, 0.000015

39. Each number is 1.5 times the previous number; 25.3125, 37.96875, 56.953125

41. $0.45 \times 0.75 = 0.3375$ **43.** $5.525 \times 6.64 = 36.686$

45. **a.** 190.06 miles **b.** 91.29 miles

47. Which framing is thicker?

49. 5 **51.** 7

Section 3.4 Dividing Decimals by Whole Numbers

(pages 130 and 131)

1. 4.3; 12.9; 3

3. $18.6 \div 4 = 4.65$

5. $88.27 \div 7 = 12.61$

7. $43.254 \div 9 = 4.806$

9. 4.2

11. 0.5

13. 4.3

15. 6.2

17. 5.58

19. 0.15

21. 2.165

23. 8.757

25. They brought down 2 zeros instead of 1.

$$\begin{array}{r} 3.112 \\ 9\overline{)28.008} \\ \underline{27} \\ 10 \\ \underline{9} \\ 10 \\ \underline{9} \\ 18 \\ \underline{18} \\ 0 \end{array}$$

27. \$0.12

29. 7.945

31. 25.2

33. 2.35

35. the 12-pack; The price per unit is \$0.74 for the 4-pack, \$0.72 for the 12-pack, and \$0.73 for the 24-pack. So, the 12-pack is the best buy.

37. Swimming a quarter second faster means to subtract 0.25 second from each swimmer's time.

39. 6

41. 7

43. A

Section 3.5 Dividing Decimals

(pages 136 and 137)

1. 10

3. $21\overline{)1766}$

5. $156 \div 47$

7. $5590 \div 647$

9. 12

11. 12

13. 12

15. 36.5

17. 18.7

19. 52.1

21. 3.525

23. 7.2

25. The decimal point in the dividend should be moved to the right instead of the left;

$0.32\overline{)146.4} \longrightarrow 32\overline{)14{,}640}$

27. 4.8 ft

29. 35.84

31. 3.11

33. about 6.04

35. about 0.78

37. =

39. <

41. 5357 bees

43. When dividing, make sure your units cancel.

45. 25%

47. 21%

49. B

Selected Answers

Section 4.1

Percents and Fractions
(pages 152 and 153)

1. $\frac{2}{12}$, because it is equal to $0.1\overline{6}$, and the others are equal to 0.16.

3. yes; You can rewrite $1\frac{1}{4}$ as the improper fraction $\frac{125}{100}$, which is equal to 125%.

5. $\frac{9}{10}$ **7.** $\frac{31}{40}$ **9.** $\frac{79}{100}$ **11.** $1\frac{22}{25}$ **13.** $2\frac{6}{25}$ **15.** $\frac{1}{250}$

17. 10%; method of Example 2

19. 55%; method of Example 2

21. 54%; method of Example 2

23. 37.5%; method of Example 3

25. 85%; method of Example 2

27. 82.5%; method of Example 3

29. The decimal point should not have been added to the percent expression.

$$\frac{14}{25} = \frac{14 \times 4}{25 \times 4} = \frac{56}{100} = 56\%$$

31. 40% **33.** $\frac{13}{25} = 52\%$ **35.** 294% **37.** 392%

39. The answer depends on the goals for each year.

41. $8\frac{1}{3}\%$ or $8.\overline{3}\%$; *Sample answer:* Multiply the numerator and the denominator by $\frac{25}{3}$. Then write the result as a mixed number.

43. 0.225 **45.** 0.9375

Section 4.2

Percents and Decimals
(pages 158 and 159)

1. B **3.** C

5. *Sample answer:* 0.11, 0.13, 0.19

7. 0.78 **9.** 0.185 **11.** 0.33 **13.** 0.4763 **15.** 1.66 **17.** 0.0006

19. 74% **21.** 89% **23.** 99% **25.** 48.7% **27.** 368% **29.** 3.71%

31. The decimal point was moved in the wrong direction. $0.86 = \underset{\smile}{0.86} = 86\%$

33. 34% **35.** $\frac{9}{25} = 0.36$ **37.** $\frac{203}{1250} = 0.1624$ **39.** 10%

41. **a.** $16.\overline{6}\%$ or $16\frac{2}{3}\%$ **b.** $\frac{5}{6}$ **43.** $\frac{31}{100}$ **45.** $4\frac{8}{25}$

47.
$$\begin{aligned} (7 + y) + 14 &= (y + 7) + 14 && \text{Comm. Prop. of Add.} \\ &= y + (7 + 14) && \text{Assoc. of Add.} \\ &= y + 21 && \text{Add 7 and 14.} \end{aligned}$$

49.
$$\begin{aligned} 6 \cdot c \cdot 5 &= 6 \cdot 5 \cdot c && \text{Comm. Prop. of Mult.} \\ &= 30c && \text{Multiply 6 and 5.} \end{aligned}$$

Section 4.3

Comparing and Ordering Fractions, Decimals, and Percents *(pages 164 and 165)*

1.

Fraction	Decimal	Percent
$\frac{18}{25}$	0.72	72%
$\frac{17}{20}$	0.85	85%
$\frac{13}{50}$	0.26	26%
$\frac{31}{50}$	0.62	62%
$\frac{9}{20}$	0.45	45%

3. 0.04; $0.04 = 4\%$, but 40%, $\frac{2}{5}$, and 0.4 are all equal to 40%.

5. 20%

7. $\frac{13}{25}$

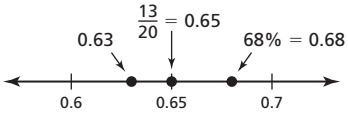
9. 76%

11. 0.12

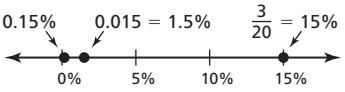
13. 140%

15. 80%

17.



19.



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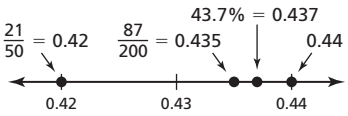


23. Japan, Brazil, United States, China

25. 21%, $0.2\overline{1}$, $\frac{11}{50}$, $\frac{2}{9}$

27. *D*

29. *C*

31. Write the numbers as percents or decimals to make the ordering easier.

33. 4.8

35. 6.66

37. C

Section 4.4

Finding the Percent of a Number *(pages 172 and 173)*

1. What is 20 multiplied by 30?; 600; 6

3. 12

5. 12.6

7. 7.2

9. 13

11. 21

13. 20.25

15. 24

17. 14

19. The percent was not written as a decimal or fraction before multiplying: $40\% \times 75 = 0.40 \times 75 = 30$.

21. 35.2 in.

23. 84

25. 94.5

27. 2.25

29. 4.2

31. =

33. >

35. 48 min

37. **a.** 432 in.^{2} **b.** 37.5%

39. *Sample answer:* Because 30% of n is equal to 2 times 15% of n and 45% of n is equal to 3 times 15% of n, you can write 30% of $n = 2 \times 12 = 24$ and 45% of $n = 3 \times 12 = 36$.

41. **a.** 243 points **b.** 97.2%

43. $1\frac{1}{2}$

45. 10

Selected Answers

Section 4.5 Percents and Estimation
(pages 178 and 179)

1–3. Sample answers are given.

1. 25%

3. 40%

5. 64% of 37 does not belong because it is about 24, and the others are about 8.

7–29. Sample answers are given.

7. 15 **9.** 4 **11.** 207 **13.** 12

15. 45 **17.** 1 **19.** about \$2 **21.** **a.** 150 **b.** 280

23. 80 **25.** 30 **27.** 180 **29.** 70

31. sometimes true; It depends on how much the percent is rounded down compared to how much the number is rounded up.

33. *Sample answer:* Northeast: 100 children
Midwest: 50 children
South: 80 children
West: 160 children

35. Your friend's estimate is closer, because $\frac{1}{3} = 0.3\overline{3}$, which is closer to 33% (0.33) than 0.3.

37. $\frac{5}{6}$ **39.** $\frac{2}{7}$

Section 5.1 Ratios
(pages 194 and 195)

1. 3 to 7, 3 : 7

3. *Sample answer:* Smith: vowels to consonants $= \frac{1}{4}$.

5. $\frac{6}{4}$, 6 : 4, 6 to 4 or $\frac{3}{2}$, 3 : 2, 3 to 2; There are 3 basketballs for every 2 soccer balls.

7. $\frac{3}{7}$, 3 : 7, 3 to 7; There are 3 shirts for every 7 pants.

9. $\frac{3}{4}$ **11.** $\frac{7}{5}$

13–19. Sample answers are given.

13. $\frac{1}{3}, \frac{2}{6}$ **15.** $\frac{1}{3}, \frac{22}{66}$ **17.** $\frac{18}{20}, \frac{27}{30}$ **19.** $\frac{3}{2}, \frac{6}{4}$

21. The numerator and denominator should be multiplied by the same number; $\frac{2}{3} = \frac{2 \times 2}{3 \times 2} = \frac{4}{6}$

23. 6 black pieces; The ratio of black to red is 3 : 5, so the ratio of black to all is 3 : 8. An equivalent ratio is 6 : 16.

25. It may be helpful to organize your results in a table.

27. 5 girls **29.** 3.29 **31.** 1.478

Section 5.2 Rates
(pages 200 and 201)

1. *Sample answer:* You walk at a rate of $\frac{2 \text{ blocks}}{1 \text{ min}}$, so you walk 12 blocks in 6 minutes.

3. $\frac{105 \text{ words}}{35 \text{ min}}$ **5.** $\frac{36 \text{ students}}{16 \text{ computers}}$ **7.** $\frac{3 \text{ baskets}}{45 \text{ min}}$ **9.** $\frac{\$48}{6 \text{ tickets}}$

11. $\frac{\$7}{1 \text{ week}}$ **13.** $\frac{45 \text{ mi}}{1 \text{ h}}$ **15.** $\frac{140 \text{ kilobytes}}{1 \text{ sec}}$ **17.** $\frac{72 \text{ mi}}{1 \text{ gal}}$

19. 6000 strikes per minute

21. The 15-pack of energy bars is the better buy because it has a smaller unit rate ($1.28 per bar) than the 10-pack ($1.35 per bar).

23. equivalent **25.** not equivalent

27. Use Guess, Check, and Revise to find how many more items Homeroom B needs to collect.

29. 66

31 and 33. Sample answers are given.

31. $\frac{2}{6}, \frac{3}{9}$ **33.** $\frac{4}{10}, \frac{8}{20}$ **35.** B

Section 5.3 Solving Rate Problems
(pages 206 and 207)

1. Distance equals speed times time.

3. 105 mi **5.** 276 ft **7.** 5 in./sec

9. 58 ft/min **11.** 12 m **13.** 7240 ft

15. $6 **17.** 50 city blocks **19.** $18.\overline{6}$ in./min

21. Time is given in two different units. Be sure to convert one of them.

23. 86 **25.** 141

Section 5.4 Mean
(pages 214 and 215)

1. No; Dividing the sum of the data by the number of data values to find the mean does not necessarily result in one of the data values.

3. Add the data values then divide by the number of data values.

5. The "average" could be 0 if you consider the most common value, or $\frac{8}{7}$ if you consider the mean.

7. 3 brothers and sisters **9.** 16 visits **11.** 3.45 minutes

13. *Sample answer:* 20, 21, 21, 21, 21, 22; 20, 20.5, 20.5, 21.5, 21.5, 22

Section 5.4

Mean *(continued)*
(pages 214 and 215)

15. 3.9 inches; No, neither team has a height that is much shorter or taller than the other heights. So, you can say that the Tigers are taller than the Dolphins on average.

17. 11 pounds; Use the mean of each collection to work backwards to find the total weight of the collection. Divide the sum of the weights of the two collections by the total number of backpacks (20) to find the mean.

19. 30

21. 15.5

Section 5.5

Median, Mode, and Range
(pages 220 and 221)

1. *Sample answer:* 1, 2, 3, 4, 5, 6

3. The greatest and least data values; The range is the difference of these values.

5. 25.4; No, the mode would be better because most of the data values are the mode of 30.

7. median: 7; mode: 3; range: 8

9. median: 92.5; mode: 94; range: 28

11. median: 17; mode: 12; range: 31

13. The data was not ordered from least to greatest; The median is 55.
49, 50, 51, 55, 58, 59, 63; The range is $63 - 49 = 14$.

15. singing

17. *Sample answer:* An outlier increases the range of a data set because there is a wider spread between the greatest and least value.

19. mean: 14.9; median: 17.5; modes: 5, 19; range: 28

21. mean: 7.61; median: 7.42; no mode; range: 4.94

23. median: 11 years; mode: 12 years; range: 2 years

25. Find the mean, median, and mode with the original values and then again with the new value.

27. *Sample answer:* 18, 21, 28, 30, 35, 36

29. Outlier: 35; With outlier: 62.125; Without outlier: 66

Section 5.6

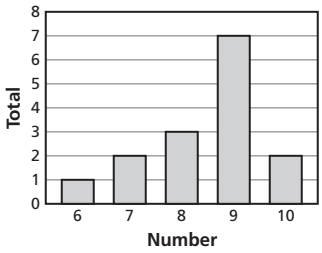
Analyzing Data Sets
(pages 226 and 227)

1. The mean is likely to be most affected unless the middle values are far apart, because then the median can be affected more by removing the outlier. The mode is unaffected unless the mode consists of outliers.

3. *Sample answer:* 190, 190, 190, 190, 192, 192, 195, 195

5.

Number	Tally	Total
6	|	1
7	||	2
8	|||	3
9	𝍸 ||	7
10	||	2



7. mean: 50; median: 40; mode: 95
Sample answer: The mean is probably best, because the mode is the greatest value and the median is too far from the greater values.

9. mean: 110; median: 114.5; mode: 144
Sample answer: Either the mean or median is best, because they are both at the middle of the data, while the mode is the greatest value.

11.

With Outlier	*Without Outlier*
mean: 83	mean: 69.14
median: 69.5	median: 67
mode: 72	mode: 72

The outlier makes the mean greater than most of the data, increases the median slightly, and does not change the mode.

13.

With Outlier	*Without Outlier*
mean: 102	mean: 84
median: 85	median: 85
mode: 85	mode: 85

The outlier makes the mean greater than all of the other values, but does not affect the median or mode.

15. *Answer should include, but is not limited to:* Prices of 10 cereals with 1 outlier; unit prices calculated.

a. Calculation of mean, median, and mode and explanation of which is best.

b. Outlier identified; mean, median, and mode calculated; measure most affected described.

17. **a.** No; The price is the mode, but it is the lowest price. Most cameras cost more.

b. By advertising the lowest price, they are likely to draw more customers to the store.

c. Knowing all the measures can help you to know whether the store has many models in your price range.

19. The mean, median, and mode increase by 2, but the range does not change.

21. 5.2 **23.** 55.2

Section 6.1

Circles and Circumference
(pages 243–245)

1. The radius is one-half the diameter.

3. *Sample answer:* A lawn game has two circular targets with 28-inch diameters. You lost one. You want to use a length of wire to make a replacement.

$C = \pi d \approx \frac{22}{7} \cdot 28 = 88$

You need a piece of wire 88 inches long.

5. 14 mm

7. 12 cm

9. 1.6 ft

11. about 44 in.

13. about 75.36 m

15. about 7.71 ft

17. about 31.4 cm; about 62.8 cm

19. about 69.08 m; about 138.16 m

21. yes; Because

$$\frac{\text{circumference}}{\text{radius}} = \frac{2\pi r}{r}$$
$$= \frac{2\pi \not{r}}{\not{r}}$$
$$= 2\pi,$$

the ratio is the same for every circle.

23. **a.** small tire: about 127 rotations; large tire: about 38 rotations

b. *Sample answer:* A bicycle with large wheels would allow you to travel farther with each rotation of the pedal.

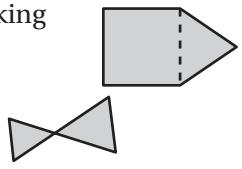
25. 22 ft

27. 65 in.

Section 6.2

Perimeters of Composite Figures
(pages 250 and 251)

1. less than and equal to; The perimeter is *less than* when figures making up a composite figure share a common side (dashed line).



The perimeter is *equal to* when the figures making up a composite figure share a common vertex.

3. 19.5 in.

5. 25.5 in.

7. 19 in.

9. 56 m

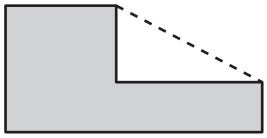
11. 30 cm

13. about 26.85 in.

15. about 36.84 ft

17. Remember to subtract the original garden side that you now cover up with the new portion of the flower garden when trying to add 15 feet to the perimeter.

19. Yes; *Sample answer:* By adding the triangle shown by the dashed line to the L-shaped figure, you *reduce* the perimeter.



21. 279.68

23. 205

Section 6.3 Areas of Circles
(pages 258 and 259)

1. Divide the diameter by 2 to get the radius. Then use the formula $A = \pi r^2$ to find the area.

3. about 254.34 mm^2 **5.** about 314 $in.^2$ **7.** about 3.14 cm^2

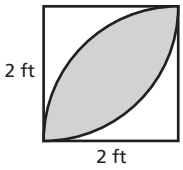
9. about 2461.76 mm^2 **11.** about 200.96 $in.^2$ **13.** about 628 cm^2

15. about 1.57 ft^2

17. What fraction of the circle is the dog's running area?

19. about 9.8125 $in.^2$; The two regions are identical, so find one-half the area of the circle.

21. about 4.56 ft^2; Find the area of the shaded regions by subtracting the areas of both unshaded regions from the area of the quarter-circle containing them. The area of each unshaded region can be found by subtracting the area of the smaller shaded region from the semicircle. The area of the smaller shaded region can be found by drawing a square about the region.



Subtract the area of a quarter-circle from the area of the square to find an unshaded area. Then subtract both unshaded areas from the square's area to find the shaded region's area.

23. 53 **25.** D

Section 6.4 Areas of Composite Figures
(pages 264 and 265)

1. *Sample answer:* You could add the areas of an 8-inch × 4-inch rectangle and a triangle with a base of 6 inches and a height of 6 inches. Also you could add the area of a 2-inch × 4-inch rectangle to the area of a trapezoid with a height of 6 inches, and base lengths of 4 inches and 10 inches.

3. 28.5 $in.^2$ **5.** 25 $in.^2$ **7.** 25 $in.^2$ **9.** 132 cm^2

11. *Answer will include but is not limited to:* Tracings of a hand and foot on grid paper, estimates of the areas, and a statement of which is greater.

13. 23.5 $in.^2$ **15.** 24 m^2

17. Each envelope can be broken up into 5 smaller figures to find the area.

19. $y \div 6$ **21.** $7w$

Section 7.1 Writing Equations in One Variable *(pages 280 and 281)*

1. An equation has an equal sign and an expression does not.

3. *Sample answer:* A number n subtracted from 28 is 5.

5. What is the circumference of a circular pond ripple with radius 3 feet? about 18.84 ft

7. $y - 9 = 8$ **9.** $w \div 5 = 6$ **11.** $5 = \frac{1}{4}c$ **13.** $n - 9 = 27$

15. $6042 = 1780 + a$ **17.** $16 = 3x$ **19.** $326 = 12(14) + 6(5) + 16x$

21. It might be helpful to organize the given information visually.

23. 13 **25.** 28 **27.** C

Section 7.2 Solving Equations Using Addition or Subtraction *(pages 287–289)*

1. Substitute your solution back into the original equation and see if you obtain a true statement.

3. subtraction **5.** So x is by itself. So the two sides remain equal.

7. yes **9.** no **11.** yes **13.** $t = 9$

15. What number plus 5 equals 12?; $a = 7$ **17.** 20 is what number minus 6?; $d = 26$

19. $z = 16$ **21.** $p = 3$ **23.** $h = 34$ **25.** $q = 11$ **27.** $x = \frac{7}{30}$ **29.** $a = 11.8$

31. They must apply the same operations to both sides.

$$\begin{array}{rr} 34 = y - 12 & \\ +\ 12 & +\ 12 \\ \hline 46 = y & \end{array}$$

33. $x - 8 = 16$; 24th floor

35. Subtraction Property of Equality; Subtract.; Addition Property of Zero

37. $k + 7 = 34$; $k = 27$ **39.** $93 = g + 58$; $g = 35$

41. $y = 15$ **43.** $v = 28$ **45.** $d = 54$

47. $x + 34 + 34 + 16 = 132$; 48 in. **49.** Addition is commutative.

51. Begin by writing the characteristics of each problem.

53. **a.** $r = f + 1.25$; $g = 1.75 - 0.5$; $f = g + 1.5$
$r = \$4$; $g = \$1.25$; $f = \$2.75$

b. \$5.25

55. 96 **57.** 5 **59.** B

Section 7.3

Solving Equations Using Multiplication or Division *(pages 294 and 295)*

1. 12

3. $\frac{4x}{4} = \frac{24}{4}$

5. $8 \cdot 3 = (n \div 3) \cdot 3$

7. $s = 70$

9. $x = 16$

11. $a = 4$

13. $y = 10$

15. $x = 15$

17. $d = 78$

19. $b = 54$

21. $n = 2.56$

23. They should have multiplied by 4.

$x \div 4 = 28$

$(x \div 4) \cdot 4 = 28 \cdot 4$

$x = 112$

25. $900 = 150y$; 6 yr

27. 9 units

29. 8 units

31. 20 cards

33. length: 20 in.; width: 5 in.

35. $t = 23$

37. $s = 16$

Section 7.4

Solving Two-Step Equations *(pages 301–303)*

1. There are two different operations.

3. $11(x - 1) = 22$; The others all can be rewritten as $11x = 22$.

5. $z = 60$

7. $c = 6$

9. $b = 3$

11. $t = 418$

13. $t = 108$

15. $s = 5.4$

17. Subtraction should be the first step.

$4 = \frac{y}{8} + 1$

$3 = \frac{y}{8}$

$24 = y$

19. 16 lb

21. $c = 4$

23. $y = 3$

25. $a = 6$

27. $x = 4$

29. $s = 10$

31. $6d + 12d = 351$; 19.5 cm

33. $g = 16$

35. $x = 22$

37. $z = 103$

39. $s = 5$

41. $2x + 5 + 7 = 18$; 3 in.

43. $3x + 4x + 4x = 132$; 12 yd

45. 4.5 cups

47. The measurements are given in two different units.

49. $\frac{17}{20}$

51. $1\frac{7}{25}$

53. B

Selected Answers

Section 7.5

Finding Dimensions of Plane Figures

(pages 310 and 311)

1. Square centimeters represents an area, not a length.

3. $42 = 7x$; 6 mm

5. $36 = \frac{1}{2}(8w)$; 9 in.

7. $40 = 2c + 24$; 8 m

9. $27 = 4a$; 6.75 ft

11. $15 = \frac{1}{2}(6 + 4)s$; 3 km

13. 0.76 m

15. 24 in.

17. Draw a diagram and label all of the dimensions you know.

19. $x = 16$

21. $h = 4.5$

23. B

Section 7.6

Finding Dimensions of Prisms

(page 316 and 317)

1. cubic units

3. 32 cubes

5. 27 cubes

7. 225 ft^3

9. $1620 = h \cdot 9 \cdot 9$; 20 cm

11. $177{,}500 = 142 \cdot 10 \cdot h$; 125 mm

13. $936 = 3 \cdot 13 \cdot \ell$; 24 in.

15. 216 cubes

17. Try to find the length of the largest shell and use that to estimate the length and width of the shadow box.

19. **a.** *Sample answer:* 324 $in.^3$

b. no; The container only holds 196 cubic inches.

21. yes

23. no

Section 8.1

Writing and Graphing Inequalities

(page 333–335)

1. Both phrases refer to numbers that are larger than a given number. The difference is that "greater than or equal to" includes the number itself, whereas "greater than" does not.

3. The graph of $x \leq 6$ has a closed circle at 6. The graph of $x < 6$ has an open circle at 6.

5. $k < 10$

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

9. $1 + y \leq 13$

11. yes

13. yes

15. no

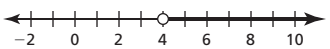
17. B

19. D

21. $x < 1$; A number x is less than 1.

23. $x \geq -4$; A number x is at least -4.

25.



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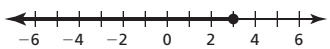

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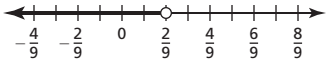

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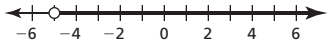
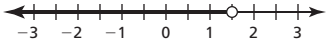
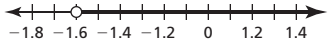


33.



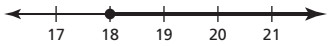
35.



37. $x \geq 1$ means that 1 is also a solution, so a closed circle should be used.

39. **a.** $b \leq 3$;

b. $\ell \geq 18$;



41. The cost of the necklace and another item should be less than or equal to \$33.

43. sometimes; The only time this is not true is if $x = 5$.

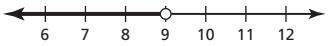
45. $p \leq 375$ **47.** $x = 9$ **49.** $x = 28$ **51.** D

Section 8.2 Solving Inequalities Using Addition or Subtraction *(pages 340 and 341)*

1. *Sample answer:* $x + 7 \geq 143$

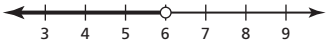
3. By solving the inequality to obtain $x \leq 1$, the graph has a closed circle at 1 and an arrow pointing in the negative direction.

5. $x < 9$;

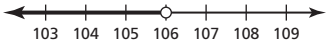


7. $5 \geq y$;

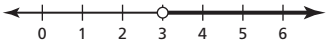
9. $6 > x$;



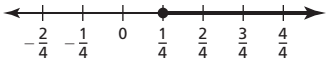
11. $y < 106$;



13. $3 < x$;



15. $\frac{1}{4} \leq n$;



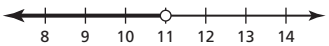
17. To solve the inequality, 9 should be added to both sides, not subtracted.

$$\begin{array}{r} 28 \geq t - 9 \\ +\ 9 \quad\quad +\ 9 \\ \hline 37 \geq t \end{array}$$

19. $x + 18.99 \leq 24$; $x \leq \$5.01$

21. $x - 3 > 15$; $x > 18$

23. $11 > s$;



25. $34{,}280 + d + 1000 > 36{,}480$; $d > 1200$ dragonflies

27. The estimate for running a mile should be greater than 4 minutes, because the world record is under 4 minutes.

29. $t = 48$ **31.** $x = 9$ **33.** A

Selected Answers

Section 8.3

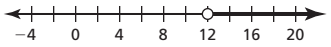
Solving Inequalities Using Multiplication or Division *(pages 348 and 349)*

1. The solution to $2x \geq 10$ includes the solution to $2x = 10$, $x = 5$, and all other x values that are greater than 5.

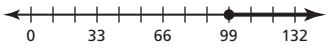
3. Div. Prop. of Ineq.

5. *Sample answer:* $\frac{x}{2} \geq 4$, $2x \geq 16$

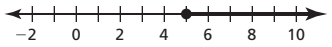
7. $n > 12$;



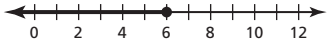
9. $c \geq 99$;



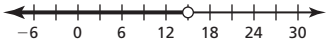
11. $x \geq 5$;



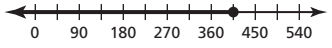
13. $p \leq 6$;



15. $x < 15$;

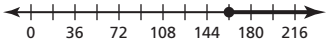


17. $v \leq 405$;



19. $q \leq 175$;

21. $x \geq 162$;



23. $8x < 168$; $x < 21$ ft

25. $8n < 72$; $n < 9$

27. $225 \geq 12w$; $18.75 \geq w$

29.

31. $80x > 2 \cdot 272$; $x > 6.8$ yards per play

33. *Sample answer:* The number of gallons of milk you can buy with \$20.; The length of a park that has an area of at least 500 square feet.

35. yes; Because $a > b$ and $x > y$.

37. yes; Because $a > b$ and $x > y$.

39. $x = 5$

41. $x = 12$

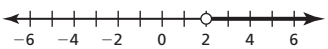
Section 8.4

Solving Two-Step Inequalities *(pages 354 and 355)*

1. Add 9 to each side to get $4x$ by itself.

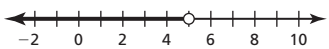
3. $s - 7 \leq 12$ does not belong because the solution is $s \leq 19$ and the solutions of the other three are all $s \leq 40$.

5. $t > 2$;

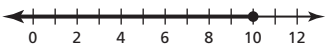


7. $s < 30$;

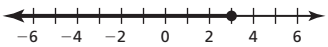
9. $a < 5$;



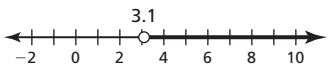
11. $y \leq 10$;



13. $c \leq 3$;



15. $k > 3.1$;



17. They should have subtracted first.

$1 + \frac{a}{6} > 2$

$\frac{a}{6} > 1$

$a > 6$

19. $10x + 240 \geq 400$; $x \geq 16$ m

21. $10x + 157 \geq 400$; $x \geq 24.3$ m

23. $22p + 180 \geq 250$; $p \geq 3.18$; Each student needs 4 more pledges.

25. $7x > 35$; $x > 5$ visits a year; An individual membership is better if you go 6 or more times a year. When you visit more than 9 times a year.

27. 2 ft

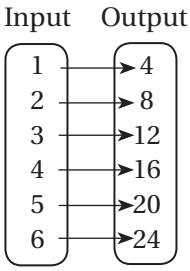
29. 6.5 m

Section 9.1

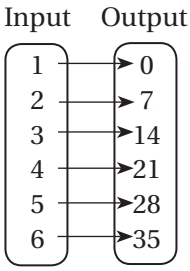
Mapping Diagrams
(pages 370 and 371)

1. the first number; the second number

3. As each input increases by 1, the output increases by 4.

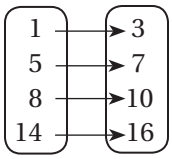


5. As each input increases by 1, the output increases by 7.

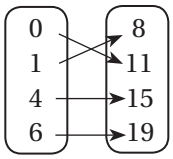


7. (1, 8), (3, 4), (5, 6), (7, 2)

9. Input Output

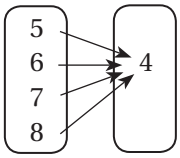


11. Input Output

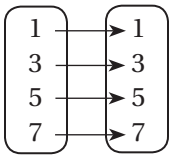


13. The first number of each ordered pair should be an input and the second number should be the output that corresponds to the input.

Input Output

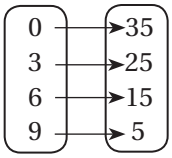


15. Input Output



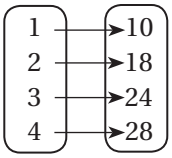
As each input increases by 2, the output increases by 2.

17. Input Output



As each input increases by 3, the output decreases by 10.

19. a. Input Output



b. The pattern is that for each input increase of 1, the output increases by $2 less than the previous increase. For each additional movie you buy, your cost per movie decreases by $1.

21. $x + 7 = 15$; $x = 8$

23. C

Selected Answers

Section 9.2

Functions as Words and Equations
(pages 376 and 377)

1. input variable: x; output variable: y

3. $y = 4x$

5. $y = x - 5$

7. $y = 6x$

9. $y = x + 11$

11. 42

13. 3.5

15. 13

17. no

19. no

21. yes

23. **a.** $d = 18s$ **b.** 540 ft

25. 5

27. The profit is equal to the revenue minus the expenses.

29. no; Many rectangles have the same perimeter but different areas.

31.

x	1	2	3
$x + 7$	8	9	10

33. C

Section 9.3

Input-Output Tables
(pages 382 and 383)

1. Choose the inputs that represent the situation or show the pattern of the function. Pair each input in the table with its resulting output.

3.

Input, x	1	2	3	4
Output, y	6	7	8	9

5. $y = x + 3$

Input, x	0	1	2	3
Output, y	3	4	5	6

7. $y = x + 8$

9. $y = \frac{x}{3}$

11. Each output in the table is one-fourth of the input, but the equation would make each output four times each input; $y = \frac{x}{4}$

13.

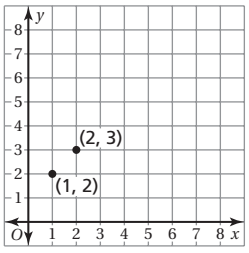
Input, x	0	2	4	10	16	26
Output, y	4	5	6	9	12	17

15. *Sample answer:*

GMT, x	6:00	7:00	8:00	9:00	10:00
Eastern Standard Time, y	1:00	2:00	3:00	4:00	5:00

$y = x - 5$

17 and 19.



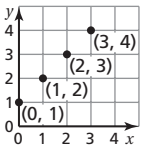
21. B

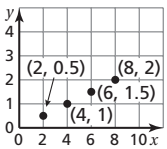
Section 9.4

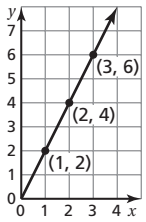
Graphs
(pages 390 and 391)

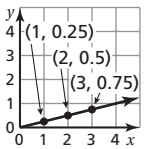
1. Make an input-output table. Plot the ordered pairs. Draw a line through the points.

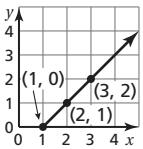
3. Find points on the graph. Make a mapping diagram or input-output table to show the pattern. Use the pattern to write a function rule.

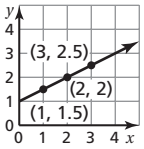
5.


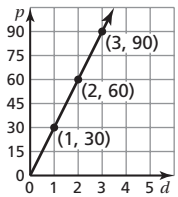
7.


9.


11.


13.


15.


17.


19. C

21. Part (c) asks for the sale price, not the discount.

23. 17

25. 6

27. 19

29. C

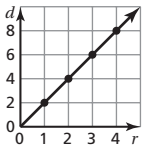
Section 9.5

Analyzing Graphs
(pages 396 and 397)

1. A function is called a linear function if its graph is a line.

3.

Radius, r	1	2	3	4
Diameter, d	2	4	6	8



$d = 2r$

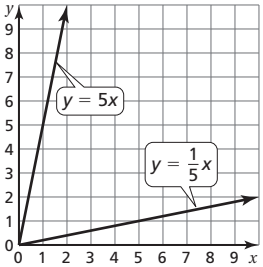
5. yes; The graph is a line.

7. no; The graph is *not* a line.

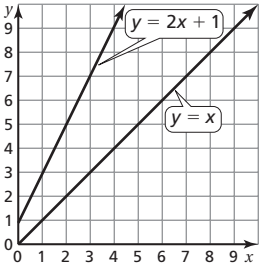
9. no; The graph is *not* a line.

11. yes; The graph is a line.

13. no; The graph is *not* a line.

15.


$y = 5x$; 5 is greater than $\frac{1}{5}$.

17.


$y = 2x + 1$; 2 is greater than 1.

19.

Figure, x	Area, y
1	1
2	2
3	4
4	8

no; The graph is *not* a line.

21. Pompano Beach; about 100 flights; *Sample answer:* From the graph, Pompano Beach has about 350 flights each day and Gainesville has about 250 flights each day.

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

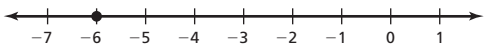
25. 0.802

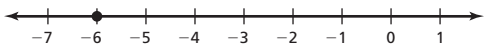
27. C

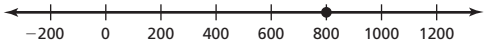
Section B.1 The Number Line
(pages A14 and A15)

1. 8, −9, 22

3. −2 does not belong because the value of each of the other expressions is 2.

5.


7.


9.


11. 6 **13.** 5 **15.** 20 **17.** 8

19. 3 **21.** 17 **23.** 110 **25.** 11

27. **a.** diver: −15; scientist: 12
b. 15, 12
c. the diver

29. 1 **31.** >

33. $-2, 0, |-1|, |4|, 5$ **35.** $-11, 0, |3|, |-6|, 9, 10$ **37.** 0

39. −1

41. sometimes; If the number is negative then its absolute value is greater, but if the number is positive then it is equal to its absolute value.

43. **a.** Florida, Louisiana, Arkansas, Tennessee, California

b. California, Louisiana, Florida, Arkansas, Tennessee

45. If x and y are both positive, or if x is negative and y is positive, or if x is 0 and y is positive, then $x < y$. If x and y are both negative, or if x is positive and y is negative, or if x is 0 and y is negative, then $x > y$.

47. 11

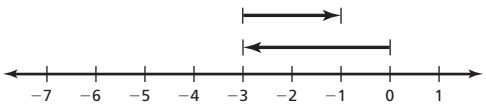
49. 21

Section B.2 Number Line Operations
(pages A20 and A21)

1. 2 **3.** 3 **5.** −8 **7.** −9 **9.** −4 **11.** −13

13. −8 **15.** −3 **17.** −2

19. When adding a positive number, 2, you move to the right, not the left.
$-3 + 2 = -1$

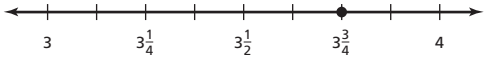


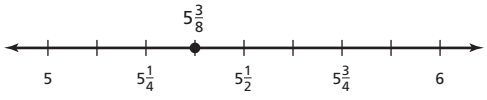
21. 9 **23.** −7 **25.** 5 **27.** 2 **29.** 8

31. To find the next term, subtract 3 from the previous term. The next three numbers in the pattern are −7, −10, and −13.

33. Find the number of points you would have if you answered the four remaining questions correctly and then write an equaiton to find your opponent's score.

35. $x < y$

37.


39.


Section B.3

Fractions on the Number Line
(pages A26 and A27)

1. a

3. *Sample answer:* $\frac{1}{2}$

5. *Sample answer:* $-2\frac{1}{4}$

7. $\frac{1}{4}$; Any positive number is greater than any negative number.

9. $-\frac{7}{2}$; $-\frac{7}{2}$ is to the right of $-\frac{15}{4}$ on a number line.

11. $-3\frac{1}{3}$; $-3\frac{1}{3}$ is to the right of $-3\frac{2}{3}$ on a number line.

13. $-1\frac{3}{4}$; $-1\frac{3}{4}$ is to the right of $-1\frac{5}{6}$ on a number line.

15. The larger sand dollar burrowed farther.

17. $-1\frac{3}{8}$

19. $-2\frac{3}{10}$

21. Write the numbers as decimals, instead of finding a common denominator.

23. $\frac{1}{4}, \frac{1}{3}, \frac{1}{2}, \frac{2}{3}, \frac{3}{4}, 1\frac{1}{4}, 1\frac{1}{3}, 1\frac{1}{2}, 1\frac{2}{3}, 1\frac{3}{4}, 2\frac{1}{4}, 2\frac{1}{3}, 2\frac{1}{2}, 2\frac{2}{3}$; NEVER ODD OR EVEN

25. 1.2

27. 0.61

29. B

Section B.4

Decimals on the Number Line
(pages A34 and A35)

1. never; A negative decimal is to the left of 0 on a number line and a positive decimal is to the right of 0 on a number line.

3. −2.5

5. 0.2

7. 3.7; Any positive number is greater than any negative number.

9. −0.9; −0.9 is to the right of −1.1 on a number line.

11. 4.9; Any positive number is greater than any negative number.

13. −0.05; −0.05 is to the right of −0.12 on a number line.

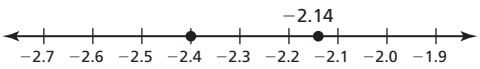
15. no

17. no

19. no

21. no

23. They compared the absolute values of the two numbers instead of using a number line.



–2.14 is greater than −2.4 because it is to the right of −2.4 on the number line.

25. $2\frac{3}{10}$; Any positive number is greater than any negative number.

27. −0.52; −0.52 is to the right of $-\frac{5}{8}$ on a number line.

29. Sirius

31. If a guitar string is tuned to its correct pitch, how far is it from the correct pitch?

33. −11

35. −5

37. C

Section B.5 Fractions and Decimals on the Number Line

(pages A40 and A41)

1. left; You are taking away that amount.

3. The sum is negative because the absolute value of the negative number is greater than the absolute value of the positive number.

5. $3\frac{1}{2}$ **7.** 2.2 **9.** -8 **11.** -7.2

13. $-3\frac{1}{2}$ **15.** $-3\frac{2}{3}$ **17.** -3.2 **19.** $2\frac{2}{3}$

21. $-2\frac{1}{2} - 2 = -4\frac{1}{2}$; $-4\frac{1}{2}$ feet

23. 0.75 **25.** $-2\frac{1}{3}$ **27.** $-1\frac{2}{3}$

29. Yes, the motor needs to run because the temperature is $-16.5°C$, which is greater than $-17.5°C$.

31. Let 0 represent the goal line and let -1 represent the 1-yard line. Start at -1, subtract $2\frac{1}{2}$, subtract $3\frac{1}{4}$, and add $1\frac{1}{2}$. Then find the distance between where you are on the number line and $-1\frac{1}{2}$. 3.75 yards were gained on fourth down.

33. 0.09, $\frac{8}{10}$, 85% **35.** 64%, $\frac{2}{3}$, 0.7

Section B.6 The Coordinate Plane

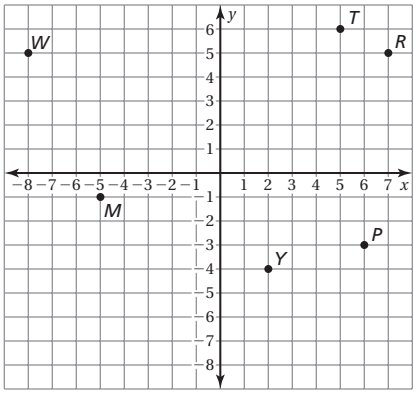
(pages A46 and A47)

1. 4

3. *Sample answer:* For $(-3, 1)$, you move 3 units left and 1 unit up. For $(1, -3)$, you move 1 unit right and 3 units down. The point $(-3, 1)$ is in Quadrant II and the point $(1, -3)$ is in Quadrant IV.

5. $(1, 2)$ **7.** $(-2, -4)$ **9.** $(-4, 1)$ **11.** $(3, -3)$ **13.** $(-2, 3)$

15–25.



15. Quadrant III

17. Quadrant IV

19. Quadrant I

21. Quadrant I

23. Quadrant II

25. Quadrant IV

27. They switched the x- and y-coordinate in their directions. To plot $(3, 5)$, start at $(0, 0)$ and move 3 units right and 5 units up.

29. $(-4, 2)$

31. 108 in.; 720 in.^{2}

33. *Sample answer:* $(-6, 3)$, $(-2, 3)$, $(-2, -9)$, $(2, -9)$

35. $y = x + 3$

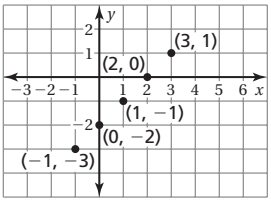
37. C

Section B.7 Graphing in the Coordinate Plane

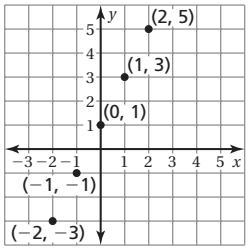
(pages A52 and A53)

1. x is the input and y is the output.

3. $y = x$

5. 

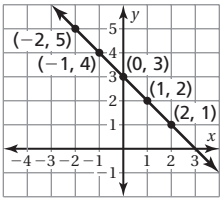
The points lie on a line.

7. 

The points lie on a line.

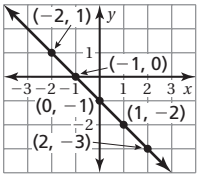
9.

Input, x	−2	−1	0	1	2
Output, y	5	4	3	2	1



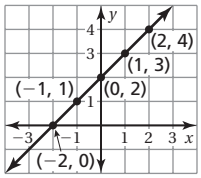
11.

Input, x	−2	−1	0	1	2
Output, y	1	0	−1	−2	−3



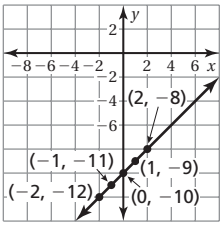
13.

Input, x	−2	−1	0	1	2
Output, y	0	1	2	3	4



15.

Input, x	−2	−1	0	1	2
Output, y	−12	−11	−10	−9	−8



17. The x-values are not subtracted correctly.

x	$4 - x$	y	(x, y)
−3	$4 - (-3)$	7	(−3, 7)
−2	$4 - (-2)$	6	(−2, 6)
−1	$4 - (-1)$	5	(−1, 5)
0	$4 - 0$	4	(0, 4)

19. D

21. B

23. $y = x - 1$

25. $y = 2x$

27. The point (0, 0) can be used to write the function because if a car is not moving, then there is no reaction time needed to stop.

29. 31

31. 114

33. D

Selected Answers