Answers for Lesson 3-1, pp. 122–124   Exercises

1. -10

2. 6

3. -1

4. -34

5. -3

6. 27

7. -60

8. -2

9. 96

10. 112

11. 3

12. $4\frac{1}{2}$

13. $6\frac{2}{5}$

14. 120

15. 45

16. 50

17. 16

18. -15

19. -8

20. -1

21. $2n + 4028 = 51{,}514;\ 23{,}743$ books

22. $2m + 18 = 60;\ 21$ min

23. $C = 39.95 + 0.35m;\ 85$ min

24. Subtr. Prop. of Eq. Simplify.
     Mult. Prop. of Eq. Simplify.

25. Add. Prop. of Eq. Simplify.
     Mult. Prop. of Eq. Simplify.

26. Subtr. Prop. of Eq. Simplify.
     Mult. Prop. of Eq. Simplify.

27. Subtr. Prop. of Eq. Simplify.
     Div. Prop. of Eq. Simplify.

28. 4

29. 75

30. -30

31. 1

32. 0.382

33. 0

34. $8\frac{3}{4}$

35. -6.4

36. 2

37. 2

38. 2.6

39. 2.6

Answers for Lesson 3-1, pp. 122–124   Exercises (cont.)

40. $8 + \frac{c}{-4} - 8 = -6 - 8$ Subtr. Prop. of Eq.

$\frac{c}{-4} = -14$ Simplify.

$\frac{c}{-4}(-4) = -14(-4)$ Mult. Prop. of Eq.

$c = 56$ Simplify.

41. $7 - 3k - 7 = -14 - 7$ Subtr. Prop. of Eq.

$-3k = -21$ Simplify.

$\frac{-3k}{-3} = \frac{-21}{-3}$ Div. Prop. of Eq.

$k = 7$ Simplify.

42. $14 - 6 = 6 - 2p - 6$ Subtr. Prop. of Eq.

$8 = -2p$ Simplify.

$\frac{8}{-2} = \frac{-2p}{-2}$ Div. Prop. of Eq.

$-4 = p$ Simplify.

43. $\frac{-y}{2} + 14 = -1$

$\frac{-y}{2} + 14 - 14 = -1 - 14$ Subtr. Prop. of Eq.

$\frac{-y}{2} = -15$ Subtraction

$2\left(\frac{-y}{2}\right) = 2(-15)$ Mult. Prop. of Eq.

$-y = -30$ Multiplication

$-1(-y) = -1(-30)$ Mult. Prop. of Eq.

$y = 30$ Multiplication

44. A   **45.** $p = 0.8c - 500$; $6437.50

46. $c = 10{,}000d + 128{,}000{,}000$; about 2200 days

47. 43   **48.** 5   **49.** 2

50. 19   **51.** 25   **52.** 87

53. −28   **54.** −34   **55.** 15.5

Answers for Lesson 3-1, pp. 122–124   Exercises (cont.)

56. 19   **57.** 31.5

58. x is the amount he needs to save each week; in 16 weeks he will save $16x$ dollars and have a total of $(40 + 16x)$ dollars. That amount should equal $129.

59. The neg. sign was dropped; -1.

60. -12 was divided by 3 instead of multiplied by 3; -36.

61. Answers may vary.

62. $5; -1; 6; -9$

63.

Fahrenheit	Celsius
212°	100°
98.6°	37°
68°	20°
32°	0°
–40°	–40°

64. a. $104°F; 30°F; -50°F$

b. Answers may vary. Sample: The formula gives good estimates except for $-40°C$.

65. This eliminates the decimals.

66. $8 - y; 5$ **67.** $1 - 2y; 2$

68. $12 - y; 7$

Answers for Lesson 3-2, pp. 129–131 Exercises

1. 9   **2.** 8   **3.** $5\frac{4}{7}$

4. 3   **5.** $2\frac{6}{7}$ **6.** 7

7. 4   **8.** 3   **9.** -3

10. $x + \frac{1}{2}x = 1725$; $1150

11. $x + 9 + x = 25$; 8 ft by 9 ft

12. 3   **13.** 8   **14.** -2

15. $\frac{2}{3}$ **16.** 2   **17.** 4

18. 4   **19.** $6\frac{4}{5}$ **20.** $13\frac{2}{5}$

21. 11   **22.** $1\frac{1}{2}$ **23.** 46

24. 7   **25.** -26 **26.** $33\frac{3}{5}$

27. $\frac{3}{14}$ **28.** $\frac{1}{3}$ **29.** 3

30. 2   **31.** 21   **32.** 0.5

33. 3.5   **34.** 9   **35.** 4.27

36. 6   **37.** 5   **38.** 28

39. 2   **40.** 9   **41.** 5

42. 20   **43.** 1   **44.** $\frac{1}{12}$

45. $5\frac{3}{5}$ **46.** 44   **47.** 9

48. -0.48 **49.** -3 **50.** 3.08

51. The student forgot to multiply -1 by 8.

52. Answers may vary. Sample: Combine $-3m$ and $5m$ first to simplify the left side of the equation.

53. Answers may vary. Sample: multiply by -2 to eliminate fractions.

Answers for Lesson 3-2, pp. 129–131　Exercises (cont.)

54. 5 　　　　　　　　**55.** $4\frac{2}{3}$ 　　　　　　　　**56.** 7 h

57. 92 mi 　　　　　　　**58.** 120 min

59. Answers may vary. Sample: $3x + 5 - 4x + 9$

60. 64 　　　　　　　　**61.** 25 　　　　　　　　**62.** 20

63. $11.68 　　　　　　　**64.** 5 weeks

65. a. $3(x - 2) = 6$ 　　　　　**66.** about 15 gal
　　b. $(4, 6)$
　　c. $3(4 - 2) = 3(2) = 6$

67. a. $\frac{1}{5}; \frac{1}{7}$ 　　　　　　　**68.** $100,000
　　b. $\frac{1}{5}t$
　　c. $\frac{1}{7}t$
　　d. $\frac{1}{5}t + \frac{1}{7}t = 1; 2\frac{11}{12}$ h

Answers for Lesson 3-3, pp. 136–138 Exercises

1. 3   **2.** 5   **3.** 7

4. 3   **5.** 3   **6.** -2

7. 7   **8.** -3 **9.** 9

10. 7

11. $16.95 + 0.05m = 22.95 + 0.02m$; 200 min

12. $44 + 30m = 99 + 25m$; 11 months

13. 4.25   **14.** 2.5

15. 0   **16.** $5.\overline{6}$

17. a. Answers may vary. Sample:

     0: $9 = 9$

     3: $-9 = -9$

   -4: $33 = 33$

   -6: $45 = 45$

  b. identity

18. identity   **19.** no solution   **20.** identity

21. identity   **22.** no solution   **23.** no solution

24. no solution   **25.** 0   **26.** identity

27. 10   **28.** no solution   **29.** identity

30. $-2\frac{1}{5}$ **31.** 0   **32.** C

33. $1200 + 9b = 25b$; 75 bags

34. $x = 5, w = 3, y = 2, a = 9$

35. $a = 3, b = 6, c = 5, d = \frac{1}{3}$

36. The student forgot a negative sign on the left side of the equation; -5.

Answers for Lesson 3-3, pp. 136–138   Exercises (cont.)

37. The student subtracted y from both sides instead of adding y to both sides; 5.3.

38. **a–b.** no solution

    c. The graphing calculator shows parallel links (no intersection), which indicates that there is no solution. Part (b) also shows that there is no solution.

39. No; an equation with a solution of 0 *has* a solution. An equation with no solution is not true for any value of the variable.

40. **a.** no

    b. 1 and 3; at 3, $4 - 3(x + 1)$ is less than $5(x - 3)$, while at 1 the opposite is true. The values must be the same for some value of x between 1 and 3.

    c. for values of x greater than 2

41. Answers may vary. Sample: $3x = 12x$

42. Answers may vary. Sample: $4x + 4 = 3x + 7$

43. Answers may vary. Sample: $-\frac{x}{2} + 4 = 2x + 7$

44. Answers may vary. Sample: $3x + 1 = 3(x + \frac{1}{3})$

45. Answers may vary. Sample: $14x - 12 = 7(2x + 3)$

46. Answers may vary. Sample: $7x - 2 = 5x$

47. 18 units

48. rectangle: 6 units, 2 units, 4 units, 4 units

Answers for Lesson 3-4, pp. 145–148   Exercises

1. $9.50/h

2. $.40/lb

3. 131 cars/week

4. 400 cal/h

5. $0.24; $0.22; 12-oz.

6. Mario

7. a. $0.97/mile
   $c = 0.97m$
   b. $1164
   c. 845 miles

8. a. $0.25 mi/mm; $d = 0.25m$
   b. 48 min

9. A

10. A

11. B

12. A

13. 480

14. 1.2

15. 10,800

16. 7.5

17. 11.25

18. 5

19. 25.2

20. 7.5

21. 6

22. -20

23. 14.4

24. 700

25. 105.6 km

26. 0.5

27. $8\frac{11}{12}$

28. $7\frac{1}{3}$

29. $-3\frac{1}{2}$

30. 8

31. 165

32. 12.5

33. 18.75

34. 14.60

35. 18.25

36. 504

37. 2520

38. 20 mi/h

39. 15 mi/h

40. 12 mi/h

41. 1 mi/h

42. 1 mi/h

43. about 0.28 mi/h

44. 3

45. $5.\overline{3}$

46. -16

47. 10.5 mm

48. 246.4 ft/s

49. about 646 students

50. about 750 students

51. about 1000 students

Answers for Lesson 3-4, pp. 145–148   Exercises (cont.)

52. Answers may vary. Sample: Multiply the numerator of each side by the denominator of the other side. Set the products equal to each other and solve the equation.

$\frac{7}{5} = \frac{x}{15}$, $(7)(15) = 5x$, $x = 21$

53. A

54. 5 people/mi^2, 2775 people/mi^2, 84 people/mi^2

55. Check students' work.

56. Bonnie: $56.00, Tim: $32.00

57. 48 V
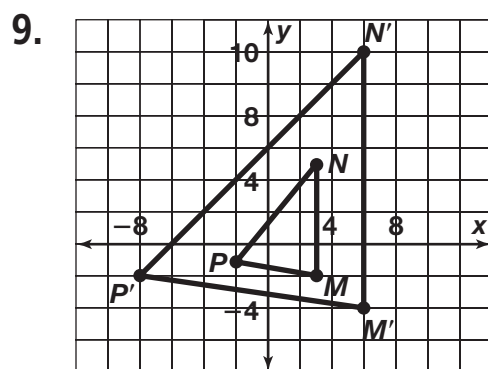
58. -7.5

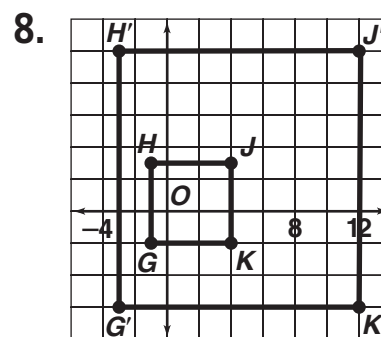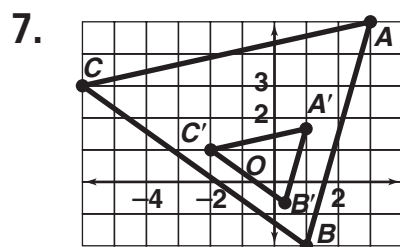**59.** 9

60. -32

61. a. 5.47 min/mi
   b. 5.37 min/mi

Answers for Lesson 3-5, pp. 152–155   Exercises

1. $\overline{AB}$ and $\overline{PQ}$, $\overline{BC}$ and $\overline{QR}$, $\overline{CA}$ and $\overline{RP}$, $\angle A$ and $\angle P$, $\angle B$ and $\angle Q$, $\angle C$ and $\angle R$

2. $\overline{ED}$ and $\overline{JH}$, $\overline{DF}$ and $\overline{HK}$, $\overline{FE}$ and $\overline{KJ}$, $\angle D$ and $\angle H$, $\angle E$ and $\angle J$, $\angle F$ and $\angle K$

3. 3.125 ft

4. $13.3\overline{3}$ cm

5. 80 in.

6. 40 m

7.

8.

9.

10. 4.8 ft

11. 10.8 in.

12. 87.5 mi

13. 145.25 mi

14. 325.5 mi

15. 350 mi

16. a. Lincoln to San Paulo $= 16$ mi
Lincoln to Duncanville $= 26$ mi
San Paulo to Duncanville $= 18$ mi

b. 26 mi roundtrip

17. 1 cm : 8 km

18. 4 in. by 6 in.

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

20. 2 in. by 3 in.

21. 3.2 in. by 4.8 in.

22. 33.75 in.

Answers for Lesson 3-5, pp. 152–155 Exercises (cont.)

23. 22.5 ft by 27 ft

24. **a.** Answers may vary. Sample: GK and RQ are not corresponding sides.
   b. $\frac{GH}{PQ} = \frac{HL}{RQ}$

25. 1 in. : 12 ft   **26.** 9 ft by 12 ft

27. 3 ft   **28.** 216 ft^2

29. yes; because it is 6 ft wide and 9 ft long

30. no; $\frac{JH}{DC} \neq \frac{FG}{AB}$

31. Check students' work.

32. 48 cm, 20 cm

33. C

34. $a = 8$ cm, $b = 6$ cm, $c = 10$ cm

35. about 1 in. : 30.5 mi

36. 400,400 km

37. **a.** $\frac{8}{8 + x} = \frac{5}{7}$
   b. 3.2
   c. 11.2 in.
   d. 39.2 in.^2

Answers for Lesson 3-6, pp. 162–165 Exercises

1. a. Let w = width.

  b. $\ell = w + 3$

  c. $2w + 2(w + 3) = 30$; 6

  d. 9 in.

2. 2 in.; 10 in.

3. 9 cm; 18 cm

4. 5 yd; 13 yd

5. 304, 305, 306

6. a. Let n = the first integer.

  b. 2

  c. $n + 2$

  d. $n + n + 2 = 118$; 58, 60

7. $-148, -150$

8. a. Let n = the first integer.

  b. 2

  c. $n + 2$

  d. $n + n + 2 = 56$; 27, 29

9. a. Let t = time for the moving van.

  b. $t - \frac{1}{2}$

  c.

Vehicle	Rate	Time	Distance Traveled
Moving van	■ 40	■ t	■ 40t
Car	■ 60	■ $t - \frac{1}{2}$	■ $60\,(t - \frac{1}{2})$

  d.

t	van	car	
1	40	30	
$1\frac{1}{2}$	60	60	✔

$t = 1\frac{1}{2}$
$t - \frac{1}{2} = 1$
The car catches the van after traveling 1 hour.

10. $1\frac{17}{30}$ h

11. a. $x; 2\frac{1}{4} - x$

    b. $22x = 32(2\frac{1}{4} - x); 1\frac{1}{3}$ h

12. a. $x; 3 - x$

    b. $320x = 280(3 - x); 1\frac{2}{5}$ h

13. a. $x; x - 20$

    b. $4x + 4(x - 20) = 250; 41\frac{1}{4}$ mi/h; $21\frac{1}{4}$ mi/h

14. 15mi/h; 20mi/h

15. $-31, -29, -27$

16. a. $1.5 + 2x + x$

    b. 15.5 ft

    c. $3x + 1.5 = 15.5; 10\frac{5}{6}$ ft or 10 ft 10 in.

17. 12:30 P.M.

18. 3:45

19. a. II.

    b. They are all multiples of three.

20. 2:30 P.M.

21. 175 mi/h; 375 mi/h

22. a. 4 P.M.

    b. the distance traveled

23. 1993, 1994, 1995

Answers for Lesson 3-6, pp. 162–165 Exercises (cont.)

24. Answers may vary. Sample: Define a variable to represent the first integer. Use this variable to write expressions for the other integers. Write an equation that describes how the integers are related. Solve this equation to find the integers.

25. Answers may vary. Sample: Jeff and Anne both left school for the city at the same time. Jeff drove 35 mi/h and Anne drove 20 mi/h. Jeff arrived 1 h before Anne. How long did each drive?

26. a. $n + n + 1 + n + 2 = 126$; 41, 42, 43

    b. Yes; if n is the middle integer, $n - 1$ is the previous integer and $n + 1$ is the next integer. The three integers would be consecutive.

27. 6 6-V; 4 12-V

28. $x + 2x - 65 + x - 10 = 165$; 60; 55 cm, 60 cm, 50 cm

29. a. $\frac{5}{6}$ h

    b. 10:15 A.M.

30. $-9, -7, -5, -3, -1$

Answers for Lesson 3-7, pp. 171–173   Exercises

1. 50%; increase

2. $33\frac{1}{3}$%; decrease

3. 25%; increase

4. 20%; decrease

5. $33\frac{1}{3}$%; increase

6. 25%; decrease

7. 25%; increase

8. 20%; increase

9. 84.4%; increase

10. 71.1%; increase

11. 60.7%; decrease

12. 14.4%; increase

13. 39%

14. 60%

15. 0.5 ft

16. 0.05 cm

17. 0.005 g

18. 0.5 in.

19. 19.25 cm^2, 29.25 cm^2

20. 48.75 mi^2, 63.75 mi^2

21. 46.75 in.^{2}, 61.75 in.^{2}

22. 51.75 km^2, 68.75 km^2

23. 253.75 in.^{2}, 286.75 in.^{2}

24. 303.75 km^2; 340.75 km^2

25. 25%

26. 25%

27. 12.5%

28. 12.5%

29. a. 48 cm^3
   b. 74.375 cm^3
   c. 28.125 cm^3
   d. 26.375 cm^3
   e. 55%

30. 23%; decrease

31. 22%; decrease

32. 157%; increase

33. 175%; increase

34. 4%; increase

35. 3%; decrease

36. 56%; decrease

37. 9%; decrease

Answers for Lesson 3-7, pp. 171–173   Exercises (cont.)

38. 17%; increase   **39.** 2%

40. 19%   **41.** 1 mm

42. no; 16% increase but a 14% decrease

43. no; increases to $70.40 but decreases to $63.36

44. Answers may vary. Sample: Joan bought shoes for $10. Sarah bought the same shoes 3 days later for $7. What was the percent change? 30% decrease

45. 24.5 cm^2, 25.5 cm^2 **46.** 58 mi^2, 59.6 mi^2

47. 54.1 in.^{2}, 54.3 in.^{2}

48. Answers may vary. Sample: Use the greatest possible error to calculate the maximum, minimum, and measured areas. Find the amounts by which the maximum and minimum differ from the measured area. Divide the greater difference by the measured area.

49. Jorge found the change of $5 but divided by the final price instead of the original price.

50. a. 100%
   b. 100%
   c. 50%
   d. 50%

51. 11%   **52.** 34%

53. a. 9%, 3%
   b. Answers may vary. Sample: The larger a measure, the smaller is the percent error.

54. Yes; 148.3 > 3 (48.7) = 146.1, and $\frac{148.3 - 48.7}{48.7} \approx 205\%$.

Answers for Lesson 3-7, pp. 171–173   Exercises (cont.)

55. a. 21%

    b. 21%

    c. 21%; answers may vary. Sample:
$1.1a \cdot 1.1a = 1.21a^2$, which is 21% greater than $a \cdot a = a^2$.
Relationship between % increase of side and area of the
square doesn't depend on the side length.

Answers for Lesson 3-8, pp. 178–180   Exercises

1. 13

2. 20

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

4. 30

5. 0.5

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

7. -1.1

8. 1.4

9. 0.6

10. -12

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

12. ±0.1

13. irrational

14. rational

15. irrational

16. rational

17. 5 and 6

18. 5 and 6

19. -12 and -11

20. 13 and 14

21. 3.46

22. -14.25

23. 107.47

24. -12.25

25. 0.93

26. ±20

27. 0

28. ±25

29. $\pm\frac{3}{7}$

30. ±1.3

31. $\pm\frac{1}{9}$

32. ±27

33. ±1.5

34. ±16

35. ±0.1

36. $\pm\frac{8}{11}$

37. ±202

38. 1

39. C

40. 21

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

42. 1.41

43. 1.26

44. -5.48

45. -33

46. -0.8

47. 6.40

48. 8.66

49. Answers may vary. Sample: The first expression means the neg. square root of 1 and the second expression means the pos. square root of 1.

50. Answers may vary. Sample: 3 and 4

51. 4

52. a. 5 s

 b. 10 s

 c. No; the object takes twice as long to fall.

53. False; zero has one square root.

54. false; $\sqrt{1} = 1$ **55.** true

56. False; answers may vary. Sample: $\sqrt{4} + \sqrt{9} \neq \sqrt{4 + 9}$.

57. a. 4 units^2
   b. $\frac{1}{2}$ unit^2
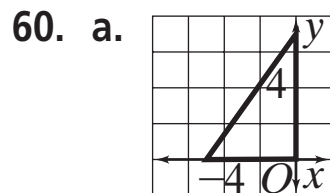   **c.** 2 units^2
   d. $\sqrt{2}$ units

Answers for Lesson 3-9, pp. 184–187 Exercises

1. 10

2. 25

3. 17

4. 26

5. 2.5

6. 1

7. 4

8. 5

9. 12

10. 7.1

11. 7.5

12. 0.6

13. 1.2 m

14. about 15.5 ft

15. about 5.8 km

16. yes

17. no

18. no

19. yes

20. no

21. yes

22. yes

23. no

24. no

25. yes

26. 1.5

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

28. 1.7

29. 1.25

30. 2.6

31. 7.0

32. a. 13.4 ft

   b. 80.5 ft^2

33. C

34. 1000 lb

35. 559.9

36. 9.0

37. 9.7

38. a. These lengths could be 2 legs or one leg and the hypotenuse.

   b. about 12.8 in. or 6 in.

39. a. $6^2 + 8^2 = 36 + 64 = 100 = 10^2$

   b. 5; 12; 7; 41

   c. Answers may vary. Sample: 10, 24, 26

40. a. 6.9 ft

   b. about 89.2 ft^2

   c. 981 watts

41. about 12.8 ft

42. a. Answers may vary.
Sample: $\sqrt{5}, \sqrt{20}, 5$
b. 5 units^2

43. a. ≈ 13.4 ft; ≈ 17.0 ft
b. ≈ 10.6 ft
c. No; the hypotenuse d must be longer than each leg.

44. An integer has 2 as a factor; the integer is even; if an integer is even, then it has 2 as a factor; true.

45. A figure is a square; the figure is a rectangle; if a figure is a rectangle then the figure is a square; false.

46. You are in Brazil; you are south of the equator; if you are south of the equator you are in Brazil; false.

47. An angle is a right angle; its measure is 90°; if the measure of an angle is 90°, then it is a right angle; true.

48. 52 units^2 **49.** 6 in.   **50.** 15

51. 14.0   **52.** 10   **53.** 11.3

54. 2.8   **55.** 8.1   **56.** 10

57. $4\sqrt{3}$ **58.** 5

59. $n^2 + (n + 1)^2 = (n + 2)^2; 3, 4, 5$

60. a.

b. $\sqrt{74}$

61. a. $a^2 + 2ab + b^2$

    b. c^2

    c. $\frac{ab}{2}$

    d. $(a + b)^2 = c^2 + 4\left(\frac{1}{2}ab\right); a^2 + 2ab + b^2 = 2ab + c^2; a^2 + b^2 = c^2$

    e. This equation is the same as the Pythagorean Thm.