

Answers for Lesson 1-1, pp. 6–8 Exercises

1. $p + 4$

2. $y - 12$

3. $12 - m$

4. $15c$

5. $\frac{n}{8}$

6. $\frac{17}{k}$

7. $x - 23$

8. $v + 3$

9–16. Choice of variable may vary.

9. $2n + 2$

10. $n - 11$

11. $9 - n$

12. $\frac{n}{82}$

13. $5n$

14. $13 + 2n$

15. $\frac{n}{6}$

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

17–20. Choice of variable may vary.

17. $c =$ total cost,
 $n =$ number of cans,
 $c = 0.70n$

18. $p =$ perimeter,
 $s =$ length of a side,
 $p = 4s$

19. $\ell =$ total length in feet,
 $n =$ number of tents,
 $\ell = 60n$

20. $\ell =$ number of slices left,
 $e =$ number of slices eaten,
 $\ell = 8 - e$

21–24. Choices of variables may vary. Samples are given.

21. $w =$ number of workers,
 $r =$ number of radios,
 $r = 13w$

22. $n =$ number of tapes,
 $c =$ cost, $c = 8.5n$

Answers for Lesson 1-1, pp. 6–8 Exercises (cont.)

23. n = number of sales,
 t = total earnings,
 $t = 0.4n$

24. n = number of hours,
 p = pay,
 $p = 8n$

25. $9 + k - 17$

26. $5n + 6.7$

27. $37t - 9.85$

28. $\frac{3b}{4.5}$

29. $15 + \frac{60}{w}$

30. $7 - 3v$

31. $5m - \frac{t}{7}$

32. $\frac{p}{14} + \frac{q}{3}$

33. $8 - 9r$

34–38. Answers may vary. Samples are given.

34. 5 more than q

35. the difference of 3 and t

36. one more than the product of 9 and n

37. the quotient of y and 5

38. the product of 7 times h and b

39–40. Choices of variables may vary. Samples are given.

39. n = number of days,
 c = change in height (m),
 $c = 0.165n$

40. t = time in months,
 ℓ = length in inches,
 $\ell = 4.1t$

41. a. i. yes; $6 = 3 \cdot 2$ ii. yes; $6 = 3 + 3$

b. Answers may vary. Sample: i; it makes sense that an equation relating lawns mowed and hours worked would be a multiple of the number of lawns mowed.

42. A

Answers for Lesson 1-1, pp. 6–8 Exercises (cont.)

43–44. Choices of variables may vary. Samples are given.

43. a. d = drop height (ft),

f = height of first bounce (ft), $f = \frac{1}{2}d$

b. 10 ft

44. s = height of second bounce (ft),

$s = \frac{1}{4}d$

45–47. Answers may vary. Samples are given.

45. You jog at a rate of 5 miles per hour. How far do you jog in 2 hours? Let d = distance in miles and t = time in hours.

46. Anabel is three years older than her brother Barry. How old will Anabel be when Barry is 12? Let a = Anabel's age in years and b = Barry's age in years.

47. The Merkurs have budgeted \$40 for a baby sitter. What hourly rate can they afford to pay if they need the sitter for 5 hours? Let h = the number of hours and c the cost per hour.

Answers for Lesson 1-2, pp. 12–15 Exercises

1. 59 2. 22 3. 7
 4. 113 5. 32 6. 29
 7. 21 8. 27 9. 124
 10. 15 11. 180 12. 169

13.

Original Price p	$p - 0.15p$	Sale Price s
\$12	$12 - 0.15(12)$	\$10.20
\$16	$16 - 0.15(16)$	\$13.60
\$20	$20 - 0.15(20)$	\$17.00
\$25	$25 - 0.15(25)$	\$21.25

14.

Height h	$\frac{1}{2}(8)h$	Area a
6 cm	$\frac{1}{2}(8)6$	24 cm^2
7 cm	$\frac{1}{2}(8)7$	28 cm^2
8 cm	$\frac{1}{2}(8)8$	32 cm^2
9 cm	$\frac{1}{2}(8)9$	36 cm^2

15. 22 16. 3 17. 44
 18. 5 19. 16 20. 4
 21. 704 22. 7744 23. 185
 24. 361 25. 57 26. 9
 27. 1936 28. 3872 29. 18
 30. 186 31. 0 32. 7
 33. 81 34. 36 35. 8 cm^3
 36. 91 in.^3 37. 21 ft^3 38. 28 cm^3
 39. $15,000 \text{ ft}^3$ 40. 2596 m^3 41. 15
 42. 7 43. 111 44. 1
 45. 51 46. 50.4 47. $1\frac{7}{15}$
 48. $7\frac{5}{8}$

Answers for Lesson 1-2, pp. 12–15 Exercises (cont.)

49. a. left side = 1
right side = 1
- b. left side = 4
right side = 2
- c. Answers may vary.
Sample: For $a = 2$ and $b = 3$, left side = 25,
right side = 13
- d. No; as seen in part (b), $(a + b)^2 = a^2 + b^2$ is not true for all values of a and b .
50. A
51. 17
52. 9
53. 143
54. 135
55. 143
56. 27
57. $14\frac{3}{4}$
58. 308
59. \$.16
60. a. 523.60 cm^3
b. 381.70 cm^3
c. about 73%
61. 41, 241, 316, 496
62. 1.2, 0.9, 0.5, 0.2
63. a. 23.89 in.^3
b. 2.0 in.^3
c. 47.38 in.^2
64. 407.72 cm^3
65. Yes; the rules for simplifying are designed to produce exactly one result.
66. $(10 + 6) \div 2 - 3 = 5$
67. $14 - (2 + 5) - 3 = 4$
68. $(3^2 + 9) \div 9 = 2$
69. $(6 - 4) \div 2 = 1$
70. a. 22; 22
b. No; part (a) shows the value is unaffected for the given numbers.
71. a. 16, 2
b. Yes; part (a) shows that the placement of parentheses can affect the value of the expression, when both add. and subtr. are involved.

Answers for Lesson 1-2, pp. 12–15 Exercises (cont.)

72. Answers may vary. Samples:

$$2(4 - 1) - 5 = 1$$

$$5 + 2 - (1 + 4) = 2$$

$$(2^4 - 1) \div 5 = 3$$

$$1 + 2 + 5 - 4 = 4$$

$$2 \cdot 5 - (1 + 4) = 5$$

$$(5^2 - 1) \div 4 = 6$$

$$5 + 4 - 1 \cdot 2 = 7$$

$$2^5 \div (4 \cdot 1) = 8$$

$$2^5 \div 4 + 1 = 9$$

$$4^2 - (1 + 5) = 10$$

$$(4^2 - 5) \div 1 = 11$$

$$1 + 2 + 4 + 5 = 12$$

$$2^{(4-1)} + 5 = 13$$

$$2 \cdot 5 + 1 \cdot 4 = 14$$

$$5(4 - 1^2) = 15$$

$$2(1 + 5) + 4 = 16$$

$$5 + 4(2 + 1) = 17$$

$$4(5 - 1) + 2 = 18$$

$$4 \cdot 5 - 1^2 = 19$$

$$4^2 + 5 - 1 = 20$$

Answers for Lesson 1-2, pp. 12–15 Exercises (cont.)

73. a. 38 ft^2

b. Yes; $2h\left(\frac{b_1 + b_2}{2}\right) = 2\left[h\left(\frac{b_1 + b_2}{2}\right)\right]$.

No; $h\left(\frac{2b_1 + b_2}{2}\right) \neq 2h\left(\frac{b_1 + b_2}{2}\right)$

since $b_2 \neq 0$.

Yes; $h\left(\frac{2b_1 + 2b_2}{2}\right) = h\left(\frac{2(b_1 + b_2)}{2}\right) =$
 $2\left[h\left(\frac{b_1 + b_2}{2}\right)\right]$.

Answers for Lesson 1-3, pp. 20–23 Exercises

1. integers, rational numbers
2. rational numbers
3. rational numbers
4. natural numbers, whole numbers, integers, rational numbers
5. rational numbers
6. integers, rational numbers
7. whole numbers, integers, rational numbers
8. rational numbers
9. rational numbers
10. irrational numbers
11. Answers may vary.
Sample: -17
12. Answers may vary.
Sample: 53
13. Answers may vary.
Sample: 0.3
14. rational numbers
15. whole numbers
16. integers
17. whole numbers
18. rational numbers
19. true
20. False; answers may vary. Sample: $-\frac{2}{3}$
21. False; answers may vary.
Sample: 6
22. true
23. False; answers may vary.
Sample: $-6 < |-6|$
24. $>$
25. $<$
26. $>$
27. $=$
28. $2.001, 2.01, 2.1$
29. $-9\frac{3}{4}, -9\frac{2}{3}, -9\frac{7}{12}$
30. $-\frac{5}{6}, -\frac{1}{2}, \frac{2}{3}$
31. $-1.01, -1.001, -1.0009$
32. $0.63, 0.636, \frac{7}{11}$
33. $\frac{22}{25}, 0.8888, \frac{8}{9}$
34. 4

Answers for Lesson 1-3, pp. 20–23 Exercises (cont.)

35. 9
36. $\frac{9}{14}$
37. 0.5
38. $\frac{3}{5}$
39. 0
40. 1295
41. $\frac{4}{5}$
42. Answers may vary.
Sample: $\frac{1}{5}$
43. Answers may vary.
Sample: $\frac{5}{1}$
44. Answers may vary.
Sample: $\frac{213}{10}$
45. Answers may vary.
Sample: $\frac{1034}{1000}$
46. Answers may vary.
Sample: $\frac{-4}{1}$
47. natural numbers, whole numbers, integers, rational numbers
48. natural numbers, whole numbers, integers, rational numbers
49. rational numbers
50. rational numbers
51. =
52. >
53. <
54. >
55. =
56. >
57. 6
58. 9
59. a
60. 28
61. 48
62. 5
63. a. irrational
b. No; π has no final digit.
64. D
65. Yes; all can be expressed as ratios of themselves to 1.
66. sometimes
67. sometimes
68. sometimes
69. always
70. -6
71. 17
72. 1
73. 10
74. a. $2.75 \frac{\text{g}}{\text{cm}^3}$, $19.3 \frac{\text{g}}{\text{cm}^3}$, $10.5 \frac{\text{g}}{\text{cm}^3}$, $3.5 \frac{\text{g}}{\text{cm}^3}$
b. aluminum, diamond, silver, gold

Answers for Lesson 1-3, pp. 20–23 Exercises (cont.)

75. Answers may vary. Samples are given.

a. -2.2

b. -2.81

c. $-2\frac{1}{8}$

d. Yes; find the average of the two given numbers.

Answers for Lesson 1-4, pp. 29–31 Exercises

1. $s = 4c$
2. $c = 1.25n$
3. $c = 40 + 25h$
4. $c = 4 + 6t$
5. number of minutes; cost
6. depth; water pressure
7. number of gallons of gas; distance traveled; 10 to 12 gallons; 250 to 300 miles
8. number of games; total cost; 4 to 8 games; \$10 to \$20
9. 500, 625, $w = 125m$
10. \$51, \$63, $c = 3 + 12h$
11. a. Yes; there is one range value for each domain value.
b. year; number of students
12. a. 0 to 4 books; 0 to 14 pounds
b. No; you cannot have a fractional amount of a book. Yes; books can weigh fractional amounts.
13. 5 units, 7 units, 9 units, 11 units, $p = 3 + 2n$
14. size of engine; price. The greater the engine size, the greater the cost of the motorcycle.
15. a. 2, 5, 10, 17
b. Yes; there is one range value ($x^2 + 1$) for each domain value (x).
16. a.

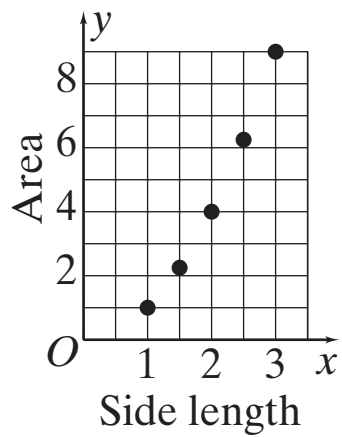
Figure Number n	Hexagons h
1	1
2	7
3	19

b. 37
c. Yes; there is one range value (h) for each domain value (figure number).

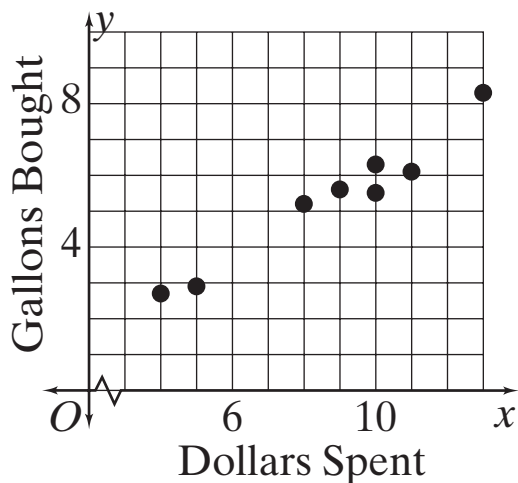
Answers for Lesson 1-4, pp. 29–31 Exercises (cont.)

17. a. 1, 2.25, 4, 6.25, 9
b. side length, area

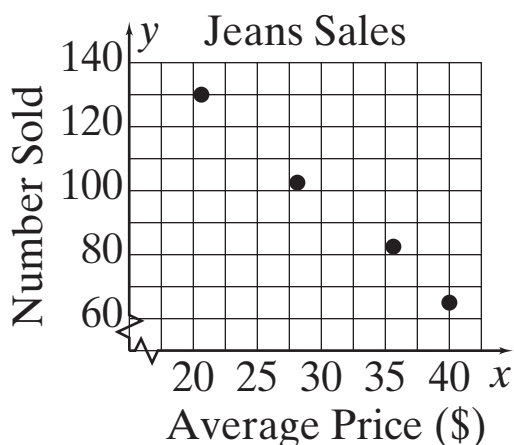
c.



1.



2.



3. neg. correlation

4. pos. correlation

5. no correlation

6. Neg. correlation; the more classes you take, the more work you have, so the less free time you have.

7. Pos. correlation; the more snow the greater the sales of snow shovels.

8. Pos. correlation; the greater the number of cars, the higher the pollution levels for a city.

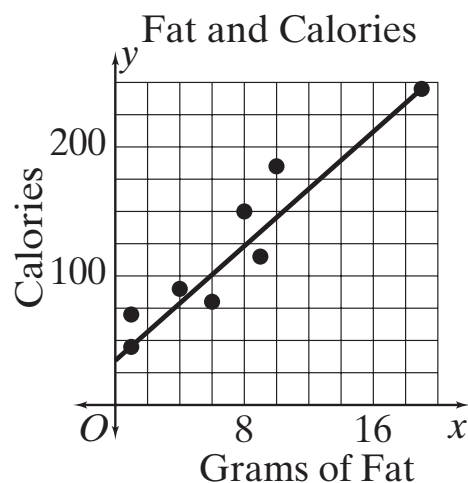
9. No correlation; baby's length at birth is not related to its birthday.

10. Pos. correlation; the more you exercise, the more Calories you burn.

Answers for Lesson 1-5, pp. 35–37 Exercises (cont.)

11. No correlation; the age of a high school student and speed are not related.
12. Answers may vary. Samples: Pos. correlation; the number of hours a person earning an hourly wage works and the size of the paycheck. Neg. correlation; the number of people working on a project and the time it takes to complete the project. No correlation; person's height and the length of his or her hair.
13. a. neg. correlation
b. Answers may vary. Sample: No; it is generally not reasonable to conclude that correlation implies cause.
14. a. Neg. correlation; rain or snow makes travel more difficult or inconvenient, so voters would be less likely to go to the polls.
b. Answers may vary. Sample: In general, the weather has the same effect on both sides, but candidates usually want as many votes as possible, so they should be concerned.

15. a.



- b. pos. correlation
- c. In general, it appears that the greater the number of grams of fat in a serving of food, the greater the number of Calories.
- d. Answers may vary. Sample: about 200 Cal

Answers for Lesson 1-5, pp. 35–37 Exercises (cont.)

16. a. the distance a car traveled on the Indiana toll road and the toll charged
- b. The points have the same x -coordinate, that is, they lie on the same vertical line.
- c. The points have the same y -coordinate, that is, they lie on the same horizontal line.
- d. Pos. correlation; in general, as distance increases, the toll increases.
17. Answers may vary. Sample: ages of adults and the number of hours they sleep
18. No; there is no relationship between cavities and vocabulary
19. Yes; time spent clearing depends on the amount of snowfall, so there is a causal relationship.
20. No; the time of sunrise does not cause the daily high temperature.

Answers for Lesson 1-6, pp. 43–45 Exercises

1. 12; 11; 10; median 2. 15; 15; 15; any
3. 63; 52; none; median 4. 4.4; 4.8; 4.8; median or mode
5. $\frac{3.8 + 4.2 + 5.3 + x}{4} = 4.8; 5.9$
6. $\frac{99 + 86 + 76 + 95 + x}{5} = 91; 99$
7. $\frac{100 + 121 + 105 + 113 + 108 + x}{6} = 112; 125$
8. $\frac{31.7 + 42.8 + 26.4 + x}{4} = 35; 39.1$
9. 18 10. 4.2
11. 20 12. $9\frac{3}{8}$
13. List 1—43; 52.2
List 2—14; 52.2

The second set of data is less spread out.

14. $\begin{array}{l|l} 1 & 0 \ 5 \ 5 \ 8 \\ 2 & 2 \ 5 \ 8 \\ 3 & 5 \ 6 \\ 1 & 0 \text{ means } 10 \end{array}$
15. $\begin{array}{l|l} 15 & 3 \ 7 \\ 16 & \\ 17 & 5 \ 6 \\ 18 & 4 \ 6 \\ 15 & 3 \text{ means } 15.3 \end{array}$
16. $\begin{array}{l|l} 76 & 1 \ 8 \ 8 \\ 77 & 6 \\ 78 & 5 \ 5 \ 8 \\ 76 & 1 \text{ means } 761 \end{array}$

Answers for Lesson 1-6, pp. 43–45 Exercises (cont.)

$$\begin{array}{r|l} 17. & 0 \quad 2 \quad 8 \\ & 1 \quad 4 \\ & 2 \quad 2 \quad 6 \\ & 3 \quad 5 \\ & 4 \quad 3 \quad 5 \end{array}$$

0 | 2 means 0.2

- 18.** Class A—60.75, 59.5, 54, 35
Class B—60.35, 59, 52 and 79, 38
- 19.** Type A—0.30, 0.31, 0.23 and 0.31, 0.18
Type B—0.42, 0.44, 0.31, 0.23
- 20.** 7.3125, 6.75, none, 4.7
- 21.** -3.1 , -2 , -1 and -2 , 15
- 22.** 46.525, 46.5, none, 45.0
- 23.** 4; fewer than 4 data items cannot satisfy all the conditions.
To see that 4 data items can satisfy all the conditions, use 6.6, 6.6, 7, and 11.
- 24.** a. 2.425 m, 2.4 m
b. 2.5 m; 2.4 m
- 25.** a. A—5.7875, 5.75, 5.4, 1.2
B—5.5625, 5.45, none, 2.9
b. A—mean. There are no outliers.
B—median. The mean is thrown off by high outliers.
c. Plant A has better quality control because there is a smaller range.
- 26.** Answers may vary. Sample: 50, 62, 64, 64, 64, 65, 65, 85
- 27.** 10

Answers for Lesson 1-6, pp. 43–45 Exercises (cont.)

28. An outlier can skew the mean of a set of numbers enough that it is not a reliable measure of central tendency.

29.

July		April
7 2 0 0 0	0	
	0	1
	8	2
		3
8 8 0	4	5 5
	0	5 5 5
3 1	6	3 3 5 7
	7	
	1	8 1 7 8
		9 4
	10	7 8

means $0.40 \leftarrow 0 \mid 4 \mid 5 \rightarrow$ means 0.45

30. Check students' work. **31.** 46.4 mi/h

Answers for Chapter Test, p. 50

1. $n = \text{number}$, $c = \text{cost}$,
 $c = 2.3n$
2. $p = \text{payment}$,
 $c = \text{change}$,
 $c = 10 - p$
3. 4
4. 0
5. $\frac{5}{9}$
6. 12
7. False, since $\frac{1}{2}$ is a rational number but is not an integer.
8. False, since $|0| = 0$, which is not pos.
9. $-10(2 - 11)$
10. $(p - \frac{5}{8})(\frac{1}{4} + p)$
11. Check student's work.
12. \$19.30
13. neg. correlation
14. about 41°F
15. about 20°F
16. If a and b have different signs, $|\frac{a}{b}|$ is positive and $\frac{a}{b}$ is negative.
17.

0	6 7 9 9
1	5 5 7
2	0 3
1	5

1 | 5 means 15%
range: 17%
18. $13.\bar{4}\%$, 15%, 9%, and 17%
19. a. $p = 1.59w$
b. \$22.26
c. about 6.3 pounds

Answers for Chapter Test, p. 50 (cont.)

20. number of lawns mowed, amount earned; for n lawns and a amount earned, the function rule is $a = 15n$.
21. number of flowers sold, amount of profit; for n flowers sold and a amount of profit, the function rule is $a = (1.50 - 0.80)n$ or $a = 0.7n$
22. a. $s = 40 + 12w$
b. \$124