

CHAPTER 1

Think & Discuss (p. 1)

1.

Country	Speed (mi/h)
Spain	129.9
U.S.A.	97.7
Japan	162.6
Italy	102.4
France	157.9
England	111.8

2. Speed in km/h = $\frac{\text{speed in mi/h}}{0.621}$

3.

Country	Speed (km/h)
Spain	209.1
U.S.A.	157.3
Japan	261.8
Italy	164.9
France	254.3
England	180.0

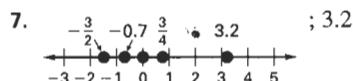
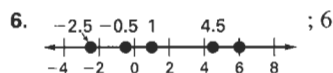
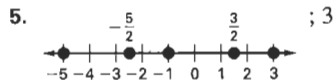
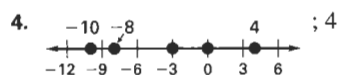
Skill Review (p. 2)

- $-3 + 14 = 11$
- $7(-10) = -70$
- $-1 - (-9) = 8$
- $-45 \div (-5) = 9$
- $(-12)(-2) = 24$
- $8 - 15 = -7$
- $30 \div (-3) = -10$
- $-6 + (-2) = -8$
- $A = \frac{1}{2}(10 \text{ units})(12 \text{ units})$
 $= 60 \text{ units}^2$
- $A = (11 \text{ units})^2 = 121 \text{ units}^2$
- $A = (15 \text{ units})(11 \text{ units})$
 $= 165 \text{ units}^2$
- $A = \left(\frac{1}{2} \cdot 9 \text{ units}\right)^2 \pi$
 $= (4.5 \text{ units})^2 \pi$
 $= 20.25 \pi \text{ units}^2$
 $\approx 63.6 \text{ units}^2$

Lesson 1.1

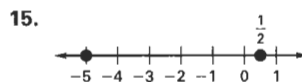
1.1 Guided Practice (p. 7)

- A rational number is a number that can be written as the ratio of two integers. An irrational number is a real number that is not rational and when written as a decimal, it neither terminates nor repeats.
- Sample answer: $0, -2, \frac{5}{4}, \sqrt{7}$
- C; Negative integers are not whole numbers.



- commutative property of addition
- inverse property of addition
- identity property of multiplication
- commutative property of multiplication
- identity property of addition
- inverse property of multiplication
- 132 feet per sec; canceling like units from numerators and denominators leaves feet in the numerator and seconds in the denominator.

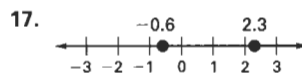
1.1 Practice and Applications (pp. 7-10)



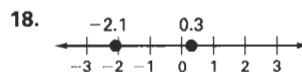
$\frac{1}{2} > -5$



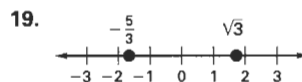
$4 > \frac{3}{4}$



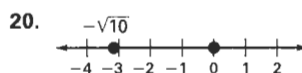
$2.3 > -0.6$



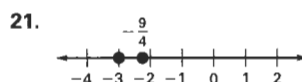
$0.3 > -2.1$



$-\frac{5}{3} < \sqrt{3}$

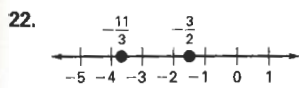


$0 > -\sqrt{10}$

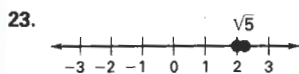


$-\frac{9}{4} > -3$

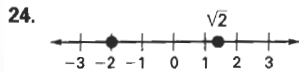
Chapter 1 continued



$$-\frac{3}{2} > -\frac{11}{3}$$



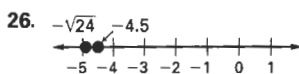
$$\sqrt{5} > 2$$



$$-2 < \sqrt{2}$$



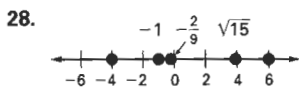
$$\sqrt{8} > 2.5$$



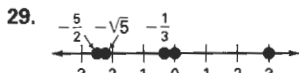
$$-4.5 > -\sqrt{24}$$



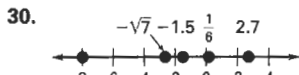
$$-6, -3, -\frac{1}{2}, 2, \frac{13}{4}$$



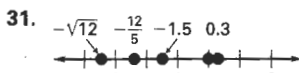
$$-4, -1, -\frac{2}{9}, \sqrt{15}, 6$$



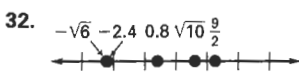
$$-\frac{5}{2}, -\sqrt{5}, -\frac{1}{3}, 0, 3$$



$$-8, -\sqrt{7}, -1.5, \frac{1}{6}, 2.7$$



$$-\sqrt{12}, -\frac{12}{5}, -1.5, 0, 0.3$$



$$-\sqrt{6}, -2.4, 0.8, \sqrt{10}, \frac{9}{2}$$

33. inverse property of addition 34. associative property of multiplication 35. commutative property of multiplication 36. associative property of addition 37. identity property of multiplication 38. distributive property

39. Yes; the associative property of addition is always true for real numbers.

40. No; *Sample answer:* $(3 - 4) - 5 = -1 - 5 = -6$ but $3 - (4 - 5) = 3 - (-1) = 4$ 41. Yes; the associative property of multiplication is always true for real numbers.

42. No; *Sample answer:* $(18 \div 6) \div 3 = 3 \div 3 = 1$, but $18 \div (6 \div 3) = 18 \div 2 = 9$ 43. $32 + (-7) = 25$

44. $-9 + (-6) = -15$ 45. $-5 - 8 = -13$

46. $-1 - (-10) = 9$ 47. $9 \times (-4) = -36$

48. $-7 \times (-3) = 21$ 49. $-5 \div (-\frac{1}{2}) = 10$

50. $-14 \div \frac{7}{4} = -8$ 51. 13 ft 52. $8\frac{7}{8}$ L 53. \$612.50

54. 34.09 mi/h or $34\frac{1}{11}$ mi/h 55. Honolulu, HI; New Orleans, LA; Jackson, MS; Seattle-Tacoma, WA; Norfolk, VA; Atlanta, GA; Detroit, MI; Milwaukee, WI; Albany, NY; Helena, MT; three cities 56. Mark O'Meara; Jim Furyk; Paul Azinger; Tiger Woods; Jay Haas; Jeff Maggert; Lee Janzen; Jumbo Ozaki; Corey Pavin; Vijay Singh;

57. $(0 + 6 + 3 + 2 + 0 + 2)(3) +$

$(7 + 7 + 7 + 0 + 1) = 39 + 22 = 61; 70 - 61 = 9$; Yes; the result of performing the given operations is 9, which is equal to the check digit 9.

58. $(3)(0 + 1 + 0 + 4 + 7 + 0) + (4 + 8 + 0 + 8 + 0) = 36 + 20 = 56; 60 - 56 = 4$; No; the result of performing the given operations is 4, which is not equal to the check digit 3.

59. Sky Central Plaza: $1056 \text{ ft} \times \frac{1 \text{ mi}}{5280 \text{ ft}} = 0.2 \text{ mi}$;

$1056 \text{ ft} \times \frac{12 \text{ in.}}{1 \text{ ft}} = 12,672 \text{ in.}; 1056 \text{ ft} \times \frac{1 \text{ yd}}{3 \text{ ft}} = 352 \text{ yd}$

Petronas Tower I: $1483 \text{ ft} \times \frac{1 \text{ mi}}{5280 \text{ ft}} \approx 0.2809 \text{ mi}$;

$1483 \text{ ft} \times \frac{12 \text{ in}}{1 \text{ ft}} = 17,796 \text{ in.}; 1483 \text{ ft} \times \frac{1 \text{ yd}}{3 \text{ ft}} \approx 494.3 \text{ yd}$

60. $\frac{500 \text{ ft}}{75 \text{ sec}} \times \frac{1 \text{ mi}}{5280 \text{ ft}} \times \frac{60 \text{ sec}}{1 \text{ min}} \times \frac{60 \text{ min}}{1 \text{ hr}} \approx 4.5 \text{ mi/hr}$

61. $\$600 \times 0.015 = \9 ; yes

62. $\$600 \times \frac{1.5 \text{ francs}}{\$1} = 900 \text{ francs}$

63. $321 \text{ francs} \times \frac{\$1}{1.5 \text{ francs}} = \214

64. $\frac{3^\circ\text{F}}{1000 \text{ ft}} \times 25,000 \text{ ft} = 75^\circ\text{F}$ 65. $60^\circ\text{F} - 75^\circ\text{F} = -15^\circ\text{F}$

66. a. Quesnel Lake to Kamloops $\approx 250 \text{ km}$;

Kamloops to Revelstoke $\approx 200 \text{ km}$;

Revelstoke to Lethbridge $\approx 450 \text{ km}$;

Lethbridge to Red Deer $\approx 300 \text{ km}$;

Red Deer to Quesnel Lake $\approx 550 \text{ km}$;

Total distance $\approx 1750 \text{ km}$; Lethbridge is about half way.

Chapter 1 continued

66. b. $1750 \text{ km} \times \frac{1 \text{ L}}{12 \text{ km}} \times \frac{\$29}{1 \text{ L}} \approx \42.29 ;
 $1750 \text{ km} \times \frac{1 \text{ L}}{12 \text{ km}} \times \frac{1 \text{ fill-up}}{60} \approx 2.4 \text{ fill-up}$; Since we start with a full tank, we will have to stop 2 times.

c. $1750 \text{ km} \times \frac{1 \text{ h}}{88 \text{ km}} \approx 19.9 \text{ h}$ or 19 h 53 min

67. a. associative property of addition b. identity property of multiplication c. distributive property d. identity property of multiplication e. distributive property

1.1 Mixed Review (p. 10)

68. -8 69. 63 70. -4 71. -30 72. -5 73. 19
 74. -8 75. -34 76. $x + 7$ 77. $x - 3$ 78. $6x$
 79. $\frac{1}{2}x$ 80. $\frac{1}{2}(6 \text{ in.})(4 \text{ in.}) = 12 \text{ in.}^2$
 81. $\frac{1}{2}(7 \text{ in.})(3 \text{ in.}) = 10.5 \text{ in.}^2$ 82. $(5 \text{ in.})(7 \text{ in.}) = 35 \text{ in.}^2$
 83. $(25 \text{ in.})(30 \text{ in.}) = 750 \text{ in.}^2$

Lesson 1.2

1.2 Guided Practice (p. 14)

1. base $\rightarrow 8^{4^{\text{exponent}}}$; The base, 8, is being multiplied by itself, and the exponent, 4, is the number of times the base is to be used as a factor. 2. $6x^3, -17x, 5$ 3. evaluate the power; divide; do addition and subtraction from left to right;
 $3 - 8^2 \div 4 + 1 = 3 - 64 \div 4 + 1 = 3 - 16 + 1 = -12$
4. $5 + 2(16 \div 2)^2 = 5 + 2(8)^2$
 $= 5 + 2(64)$
 $= 5 + 128 = 133$
5. $4x - (3y + 7x) = 4x - 3y - 7x$
 $= (4x - 7x) - 3y$
 $= (4 - 7)x - 3y$
 $= -3x - 3y$
6. $2 - 8 = -6$
7. $3(-3) + 14 = -9 + 14 = 5$ 8. $5(5 + 4) = 5(9) = 45$
9. $(6)^2 - 9 = 36 - 9 = 27$ 10. $9y - 14y = -5y$
11. $11x + 6y - 2x + 3y = (11x - 2x) + (6y + 3y)$
 $= 9x + 9y$
12. $3(x + 4) - (6 + 2x) = 3x + 12 - (6 + 2x)$
 $= 3x + 12 - 6 - 2x$
 $= (3x - 2x) + (12 - 6)$
 $= x + 6$
13. $3x^2 - 5x + 5x^2 - 3x = (3x^2 + 5x^2) + (-5x - 3x)$
 $= 8x^2 + (-8x)$
 $= 8x^2 - 8x$
14. CD price = \$11; Number of CDs = n ; Cassette price = \$7; Number of Cassettes = $10 - n$;

$$11n + 7(10 - n) = 11n + 70 - 7n = 4n + 70;$$

$$\text{When } n = 6: 4(6) + 70 = 24 + 70 = \$94$$

1.2 Practice and Applications (pp. 14-16)

15. 8^3 16. x^5 17. 5^n 18. x^7
19. $4^4 = 4 \times 4 \times 4 \times 4 = 256$
20. $(-4)^4 = (-4) \times (-4) \times (-4) \times (-4) = 256$
21. $-2^5 = -(2) \times (2) \times (2) \times (2) \times (2) = -32$
22. $(-2)^5 = (-2) \times (-2) \times (-2) \times (-2) \times (-2) = -32$
23. $5^3 = 5 \times 5 \times 5 = 125$
24. $3^5 = 3 \times 3 \times 3 \times 3 \times 3 = 243$
25. $2^8 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 = 256$
26. $8^2 = 8 \times 8 = 64$ 27. $13 + 20 - 9 = 33 - 9 = 24$
28. $14 \cdot 3 - 2 = 42 - 2 = 40$
29. $6 \cdot 2 + 35 \div 5 = 12 + 7 = 19$
30. $-6 + 3(-3 + 7)^2 = -6 + 3(4)^2 = -6 + 3(16)$
 $= -6 + 48 = 42$
31. $24 - 8 \cdot 12 \div 4 = 24 - 96 \div 4 = 24 - 24 = 0$
32. $16 \div (2 + 6) \times 10 = 16 \div 8 \times 10 = 20$
33. $7 - 12 = -5$ 34. $6(4) + 9 = 24 + 9 = 33$
35. $25(-1)(-1 - 4) = 25(-1)(-5) = 125$
36. $(5)^2 + 5 - 5 = 25 + 5 - 5 = 25$
37. $(2)^4 + 3(-8) = 16 + 3(-8) = 16 - 24 = -8$
38. $(3 \cdot 3)^2 - 7(2)^2 = (9)^2 - 7(2)^2 = 81 - 7(4)$
 $= 81 - 28 = 53$
39. $9(4) + 8(5) = 36 + 40 = 76$
40. $5\left(\frac{6}{3}\right) - 6 = 5\left(6 \cdot \frac{3}{2}\right) - 6 = 5(9) - 6 = 45 - 6 = 39$
41. $\frac{(-3)^2}{2(2) + 1} = \frac{9}{2(2) + 1} = \frac{9}{4 + 1} = \frac{9}{5}$
42. $\frac{(2 + 3)^2}{3(4) - 2} = \frac{(5)^2}{3 \cdot 4 - 2} = \frac{25}{3 \cdot 4 - 2} = \frac{25}{12 - 2} = \frac{25}{10} = \frac{5}{2}$
43. $\frac{-4 + 9}{-4 - 9} = \frac{5}{-13}$ 44. $\frac{2(10) + 6}{3(6) + 10} = \frac{20 + 6}{18 + 10} = \frac{26}{28} = \frac{13}{14}$
45. $\frac{4[4 - 2(-2)]}{4 + (-2)} = \frac{4(4 + 4)}{2} = \frac{4(8)}{2} = \frac{32}{2} = 16$
46. $\frac{4(3) - (-3)}{3[2(-3) + 3]} = \frac{12 - (-3)}{3(-6 + 3)} = \frac{12 - (-3)}{3(-3)}$
 $= \frac{12 + 3}{-9} = \frac{15}{-9} = -\frac{5}{3}$
47. $7x^2 + 12x - x^2 - 40x = (7x^2 - x^2) + (12x - 40x)$
 $= 6x^2 - 28x$
48. $4x^2 + x - 3x - 6x^2 = (4x^2 - 6x^2) + (x - 3x) = -2x^2 - 2x$

Chapter 1 continued

$$49. 12(n - 3) + 4(n - 13) = 12n - 36 + 4n - 52$$

$$= (12n + 4n) + (-36 - 52)$$

$$= 16n - 88$$

$$50. 5(n^2 + n) - 3(n^2 - 2n) = 5n^2 + 5n - 3n^2 + 6n$$

$$= (5n^2 - 3n^2) + (5n + 6n)$$

$$= 2n^2 + 11n$$

$$51. 4x - 2y + y - 9x = (4x - 9x) + (-2y + y) = -5x - y$$

$$52. 8(y - x) - 2(x - y) = 8y - 8x - 2x + 2y$$

$$= (-8x - 2x) + (8y + 2y)$$

$$= -10x + 10y$$

$$53. A = \frac{1}{2}(n + 10)(n) = \frac{n}{2}(n + 10);$$

$$\frac{40}{2}(40 + 10) = (20)(50) = 1000$$

$$54. A = (a + b)a = a^2 + ab;$$

$$(8)^2 + 8 \cdot 3 = 64 + 8 \cdot 3 = 64 + 24 = 88$$

$$55. A = (x + y)^2; (12 + 5)^2 = 289$$

$$56. 30,000 + 2.5t;$$

$$30,000 + 2500(5) = 30,000 + 12,500 = \$42,500;$$

$$30,000 + 2500(10) = 30,000 + 25,000 = \$55,000;$$

$$30,000 + 2500(15) = 30,000 + 37,500 = \$67,500$$

$$57. [13.2(18) + 965] \times 1000 = (237.6 + 965)1000$$

$$= (1202.6)1000$$

$$= 1,202,600;$$

about 1,200,000 people

$$1,202,600 - 965,000 = 237,600; \text{ about } 238,000 \text{ people}$$

$$58. 115,000 + 8100t;$$

$$115,000 + 8100(14) = 115,000 + 113,400 = 228,400 \text{ jobs}$$

$$59. 149 + 3.85(12)(n) = 149 + 46.20n;$$

$$149 + (46.20)(6) = 149 + 277.20 = \$426.20$$

$$60. 37,148 + 15,000t; 37,148 + 15,000(4) =$$

$$37,148 + 60,000 = 97,148 \text{ mi}$$

$$61. [4n + 8(3 - n)]15 = (4n + 24 - 8n)15$$

$$= (24 - 4n)15 = 360 - 60n;$$

$$= 360 - 60(2) = 360 - 120 = \$240$$

$$62. C \quad 63. B \quad 64. D \quad 65. C \quad 66. B \quad 67. B$$

68. T-shirt (n)	0	1	2	3	4
Sweatshirts ($8 - n$)	8	7	6	5	4
Money	200	190	180	170	160

T-shirt (n)	5	6	7	8
Sweatshirts ($8 - n$)	3	2	1	0
Money	150	140	130	120

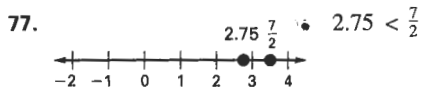
Sample answer:

$$15n + 25(8 - n) = 15n - 25n + 200 = 200 - 10n;$$

The amount of money decreases by \$10 with every member who orders a t-shirt instead of a sweatshirt.

1.2 Mixed Review (p. 17)

$$69. 20 \quad 70. 12 \quad 71. 15 \quad 72. 24 \quad 73. 105 \quad 74. 16$$



78. associative property of multiplication 79. inverse property of addition

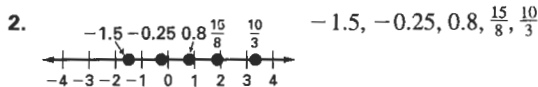
80. commutative property of addition

81. identity property of multiplication

$$82. -\frac{1}{22} \quad 83. \frac{8}{7} \quad 84. \frac{1}{12} \quad 85. -\frac{4}{5} \quad 86. \frac{16}{11} \quad 87. -9$$

$$88. \frac{1}{37} \quad 89. -\frac{1}{14}$$

Quiz 1 (p. 17)



3. distributive property 4. associative property of addition

$$5. 12x - 21 = 12(3) - 21$$

$$= 36 - 21 = 15$$

$$6. 7x - (9x + 5) = 7 \cdot \frac{1}{3} - (9 \cdot \frac{1}{3} + 5) = 7 \cdot \frac{1}{3} - (3 + 5)$$

$$= 7 \cdot \frac{1}{3} - (8) = \frac{7}{3} - 8 = -5\frac{2}{3}$$

$$7. x^2 + 5x - 8 = (-3)^2 + 5(-3) - 8$$

$$= 9 + 5(-3) - 8$$

$$= 9 - 15 - 8 = -14$$

$$8. x^3 + 4(x - 1) = (4)^3 + 4(4 - 1) = 64 + 4(4 - 1) =$$

$$= 64 + 4(3) = 64 + 12 = 76$$

$$9. x^2 - 11x + 40y - 14 = (5)^2 - 11(5) + 40(-2) - 14$$

$$= 25 - 11(5) + 40(-2) - 14$$

$$= 25 - 55 - 80 - 14 = -124$$

$$10. 3x - 2y - 9y + 4 + 5x = (5x + 3x) + (-2y - 9y) + 4$$

$$= 8x - 11y + 4$$

$$11. 3(x - 2) - (4 + x) = 3x - 6 - 4 - x$$

$$= (3x - x) + (6 - 4)$$

$$= 2x - 10$$

$$12. 5x^2 - 3x + 8x - 6 - 7x^2 = (5x^2 - 7x^2) + (-3x + 8x) - 6$$

$$= -2x^2 + 5x - 6$$

Chapter 1 continued

13. $4(x + 2x) - 2(x^2 - x) = 4(3x) - 2(x^2 - x)$
 $= 12x - 2x^2 + 2x$
 $= -2x^2 + 14x$
14. $0.35n + 13.95(15 - n)$ or $209.25 - 13.60n$, where n is the number of floppy disks

Technology Activity 1.2 (p. 18)

- $(-4)^2 - 5 = 16 - 5 = 11$
- $\frac{7}{-3 - 5} = \frac{7}{-8} = -0.875$ 3. $(1 + 4)^6 = (5)^6 = 15,625$
- $3(5 - 2) = 3(3) = 9$
- $3(5.3 - 4.1)^2 = 4.320$
- $(-2.6 - 12.5)^4 = 51,988.560$
- $(0.21 + 5.23)^3 \approx 160.989$
- $\frac{4}{3}\pi(5.5)^3 \approx 696.910$
- $\frac{9.2 - 4.5}{0.6} \approx 7.833$
- $\frac{7.3}{-6.2 - 3.6} \approx -0.745$
- $1024(1 + 0.42)^5 \approx 5912.099$
- $\frac{1 + 3 \cdot 4^2}{7.25} \approx 6.759$
- $\left(\frac{2^3 + 1}{2 \cdot 5}\right)^2 = 0.810$

Lesson 1.3

1.3 Guided Practice (p. 22)

1. An equation is a statement in which two expressions are equal. 2. The equations have the same solution. *Sample answers:* $3x = 9$, $3x - 1 = 8$ 3. An equation such as $2(x + 3) = 10$ is true for only one value of x , while an identity such as $2(x + 3) = 2x + 6$ is true for all values of x .

- $\frac{1}{5}x + \frac{1}{6} = -2$ 5. $2(x + 3) = -3(-x + 1)$
 $30\left(\frac{1}{5}x + \frac{1}{6}\right) = -2 \cdot 30$ $2x + 6 = 3x - 3$
 $6x + 5 = -60$ $6 = x - 3$
 $6x = -65$ $9 = x$
 $x = -\frac{65}{6}$
- Add 8 to each side; then divide each side by 2.
- $x + 4 = 9$ 8. $4x = 24$
 $x = 5$ $x = 6$

- $2x - 3 = 7$
 $2x = 10$
 $x = 5$
- $\frac{1}{3}x + \frac{1}{2} = \frac{11}{12}$
 $12\left(\frac{1}{3}x + \frac{1}{2}\right) = 12 \cdot \frac{11}{12}$
 $4x + 6 = 11$
 $4x = 5$
 $x = \frac{5}{4}$
- $1.5x + 9 = 4.5$
 $1.5x = -4.5$
 $x = -3$
- $2(x + 2) = 3(x - 8)$
 $2x + 4 = 3x - 24$
 $28 = x$
- Total Income = \$70,000
 Base Salary = \$21,000
 Commission Rule = 0.05
 Total Sales = n
 $70,000 = 21,000 + 0.05n$
 $49,000 = 0.05n$
 $\$980,000 = n$
- $0.2x - 8 = 0.6$
 $0.2x = 8.6$
 $x = 43$
- $\frac{3}{4}x - \frac{2}{3} = \frac{5}{6}$
 $12\left(\frac{3}{4}x - \frac{2}{3}\right) = 12 \cdot \frac{5}{6}$
 $9x - 8 = 10$
 $9x = 18$
 $x = 2$
- $6x - 4 = 2x + 10$
 $4x = 14$
 $x = \frac{14}{4} = \frac{7}{2}$

1.3 Practice and Applications (pp. 22-24)

- Subtract 5 from both sides.
- Multiply both sides by 6.
- Multiply both sides by $-\frac{7}{4}$.
- Add 9 to both sides; then divide both sides by 2.
- Subtract 2 from each side; then multiply both sides by 3.
- Add 5 to both sides; then divide both sides by -1 .
- $4x + 7 = 27$
 $4x = 20$
 $x = 5$
 $4(5) + 7 = 27$
- $7s - 29 = -15$
 $7s = 14$
 $s = 2$
 $7(2) - 29 = -15$
- $3a + 13 = 9a - 8$
 $-6a = -21$
 $a = \frac{21}{6} = \frac{7}{2}$
 $3\left(\frac{7}{2}\right) + 13 = 9\left(\frac{7}{2}\right) - 8$
- $m - 30 = 6 - 2m$
 $3m = 36$
 $m = 12$
 $12 - 30 = 6 - 24$
- $15n + 9 = 21$
 $15n = 12$
 $n = \frac{12}{15} = \frac{4}{5}$
 $15\left(\frac{4}{5}\right) + 9 = 21$
- $2b + 11 = 15 - 6b$
 $8b = 4$
 $b = \frac{1}{2}$
 $2\left(\frac{1}{2}\right) + 11 = 15 - 6\left(\frac{1}{2}\right)$

Chapter 1 continued

29. $2(x + 6) = -2(x - 4)$

$$2x + 12 = -2x + 8$$

$$4x = -4$$

$$x = -1$$

$$2(-1 + 6) = -2(-1 - 4)$$

30. $4(-3x + 1) = -10(x - 4) - 14x$

$$-12x + 4 = -10x + 40 - 14x$$

$$-12x + 4 = -24x + 40$$

$$12x = 36$$

$$x = 3$$

$$4[(-3)(3) + 1] = -10(3 - 4) - 14(3)$$

$$4(-8) = 10 - 42$$

31. $-(x + 2) - 2x = -2(x + 1)$

$$-x - 2 - 2x = -2x - 2$$

$$-3x - 2 = -2x - 2$$

$$-x = 0$$

$$x = 0$$

$$-(2) - 2(0) = -2(1)$$

32. $-4(3 + x) + 5 = 4(x + 3)$

$$-12 - 4x + 5 = 4x + 12$$

$$-8x = 19$$

$$x = -\frac{19}{8}$$

$$-4\left(3 - \frac{19}{8}\right) + 5 = 4\left(-\frac{19}{8} + 3\right)$$

$$-4\left(\frac{24 - 19}{8}\right) + 5 = 4\left(\frac{-19 + 24}{8}\right)$$

$$-\left(\frac{5}{2}\right) + 5 = \frac{5}{2}$$

33. $\frac{7}{2}x - 1 = 2x + 5$

$$\frac{3}{2}x = 6$$

$$x = \frac{12}{3} = 4$$

$$\frac{7}{2}(4) - 1 = 2(4) + 5$$

34. $\frac{1}{2}x - \frac{5}{3} = -\frac{1}{2}x + \frac{19}{4}$

$$12\left(\frac{1}{2}x - \frac{5}{3}\right) = 12\left(-\frac{1}{2}x + \frac{19}{4}\right)$$

$$6x - 20 = -6x + 57$$

$$12x = 77$$

$$x = \frac{77}{12}$$

$$\frac{1}{2}\left(\frac{77}{12}\right) - \frac{5}{3} = -\frac{1}{2}\left(\frac{77}{12}\right) + \frac{19}{4}$$

$$\frac{77}{24} - \frac{5}{3} = -\frac{77}{24} + \frac{19}{4}$$

$$24\left(\frac{77}{24} - \frac{5}{3}\right) = 24\left(-\frac{77}{24} + \frac{19}{4}\right)$$

$$77 - 40 = -77 + 114$$

35. $\frac{3}{4}\left(\frac{4}{5}x - 2\right) = \frac{11}{4}$

$$\frac{3}{5}x - \frac{3}{2} = \frac{11}{4}$$

$$20\left(\frac{3}{5}x - \frac{3}{2}\right) = 20 \cdot \frac{11}{4}$$

$$12x - 30 = 55$$

$$12x = 85$$

$$x = \frac{85}{12}$$

$$\frac{3}{4}\left(\frac{85}{12} - 2\right) = \frac{11}{4}$$

$$\frac{3}{4}\left(\frac{17}{3} - 2\right) = \frac{11}{4}$$

$$\frac{3}{4}\left(\frac{17 - 6}{3}\right) = \frac{11}{4}$$

$$\frac{3}{4} \cdot \left(\frac{11}{3}\right) = \frac{11}{4}$$

36. $-\frac{2}{3}\left(\frac{6}{5}x - \frac{7}{10}\right) = \frac{17}{20}$

$$-\frac{4}{5}x + \frac{7}{15} = \frac{17}{20}$$

$$60\left(-\frac{4}{5}x + \frac{7}{15}\right) = 60 \cdot \frac{17}{20}$$

$$-48x + 28 = 51$$

$$-48x = 23$$

$$x = -\frac{23}{48}$$

$$-\frac{2}{3}\left(6 \cdot -\frac{23}{48} - \frac{7}{10}\right) = \frac{17}{20}$$

$$-\frac{2}{3}\left(-\frac{23}{40} - \frac{7}{10}\right) = \frac{17}{20}$$

$$-\frac{2}{3}\left(\frac{-23 - 28}{40}\right) = \frac{17}{20}$$

$$-\frac{2}{3}\left(-\frac{51}{40}\right) = \frac{17}{20}$$

$$\frac{17}{20} = \frac{17}{20}$$

37. $2.7n + 4.3 = 12.94$

$$2.7n = 8.64$$

$$n = 3.2$$

$$2.7(3.2) + 4.3 = 12.94$$

$$8.64 + 4.3 = 12.94$$

38. $-4.2n - 6.5 = -14.06$

$$-4.2n = -7.56$$

$$n = 1.8$$

$$-4.2(1.8) - 6.5 = -14.06$$

$$-7.56 - 6.5 = -14.06$$

39. $3.1(x + 2) - 1.5x = 5.2(x - 4)$

$$3.1x + 6.2 - 1.5x = 5.2x - 20.8$$

$$1.6x + 6.2 = 5.2x - 20.8$$

$$3.6x = 27.0$$

$$x = 7.5$$

$$3.1(7.5 + 2) - 1.5(7.5) = 5.2(7.5 - 4)$$

$$3.1(9.5) - 11.25 = 5.2(3.5)$$

$$29.45 - 11.25 = 18.2$$

40. $2.5(x - 3) + 1.7x = 10.8(x + 1.5)$

$$2.5x - 7.5 + 1.7x = 10.8x + 16.2$$

$$-6.6x = 23.7$$

$$x \approx -3.59$$

$$2.5(-3.59 - 3) + 1.7(-3.59) = 10.8(-3.59 + 1.5)$$

$$2.5(-6.59) - 6.103 = 10.8(-2.09)$$

$$-16.475 - 6.103 \approx -22.578$$

41. $(14)(10x - 24) = 504$

$$140x - 336 = 504$$

$$140x = 840$$

$$x = 6$$

$$\text{length} = 36; \text{width} = 14$$

Chapter 1 continued

42. $(11 - x) + (3x - 2) + (x + 2) = 23$

$$11 - x + 3x - 2 + x + 2 = 23$$

$$(-x + 3x + x) + (11 - 2 + 2) = 23$$

$$3x + 11 = 23$$

$$3x = 12$$

$$x = 4$$

side lengths: 7, 10, 6

43. $x = \frac{5}{9}(-109.3 - 32)$

$$x = \frac{5}{9}(-141.3)$$

$$x = -78.5^\circ\text{C}$$

44. $x = \frac{5}{9}(101.1 - 32)$

$$x = \frac{5}{9}(69.1)$$

$$x \approx 38.4^\circ\text{C}$$

No, your dog's temperature is approximately 38.4°C and normal is 38.6°C .

45. $390 = 215 + 35x$

$$175 = 35x$$

$$5 \text{ h} = x$$

46. $28(7.25) + 6.50x = 255$

$$203 + 6.50x = 255$$

$$6.50x = 52$$

$$x = 8 \text{ h}$$

47. $40,000 + 0.05x = 71,750$ 48. $200 + 4x = 360$

$$0.05x = 31,750$$

$$x = \$635,000$$

$$4x = 160$$

$$x = 40 \text{ points}$$

49. $450 = 2(100 + 2x) + 2(60 + 2x)$

$$450 = 200 + 4x + 120 + 4x$$

$$450 = 320 + 8x$$

$$130 = 8x$$

$$16.25 \text{ ft} = x$$

50. a. radius = $40.5 + x$

$$2\pi(40.5 + x) + 2(100) = 630$$

$$81\pi + 2\pi x + 200 = 630$$

$$2\pi x = 430 - 81\pi$$

$$x = \frac{430 - 81\pi}{2\pi}$$

$$x \approx 27.9 \text{ m}$$

b. $\$5250 \times \frac{1 \text{ m}}{\$10.50} = 500 \text{ m}$

c. $500 = 2\pi(x + 40.5) + 2(100)$

$$500 = 2\pi x + 81\pi + 200$$

$$300 - 81\pi = 2\pi x$$

$$\frac{300 - 81\pi}{2\pi} = x$$

$$7.25 \text{ m} \approx x$$

Yes; with 500 m of fencing a fence can be built with a 7.25 m gap between the track and the fence.

51. $5x - 20 = 5x + 12$

$$0 = 32$$

no solution

53. $7x + 14 - 3x = 4x + 14$

$$4x + 14 = 4x + 14$$

all real numbers

54. $11x - 3 + 2x = 6x + 24 + 7x$

$$13x - 3 = 13x + 24$$

$$0 = 27$$

no solution

55. $-2(4 - 3x) + 7 = -2x + 6 + 8x$

$$-8 + 6x + 7 = -2x + 6 + 8x$$

$$6x - 1 = 6x + 6$$

$$0 = 7$$

no solution

56. $10 - 5x = 3 - 2x + 7 - 3x$

$$10 - 5x = 10 - 5x$$

all real numbers

1.3 Mixed Review (p. 24)

57. $\pi(5 \text{ in.})^2 = 25\pi \text{ in.}^2 \approx 78.5 \text{ in.}^2$ 58. $(4 \text{ in.})^2 = 16 \text{ in.}^2$

59. $\pi(7 \text{ in.})^2 = 49\pi \text{ in.}^2 \approx 154 \text{ in.}^2$ 60. $(9 \text{ in.})^2 = 81 \text{ in.}^2$

61. $24 - (9 + 7) = 24 - 16 = 8$

62. $-16 + 3(8 - 4) = -16 + 3(4) = -16 + 12 = -4$

63. $-3 + 6(1 - 3)^2 = -3 + 6(-2)^2 = -3 + 6(4)$
 $= -3 + 24 = 21$

64. $2(3 - 5)^3 + 4(-4 + 7) = 2(-2)^3 + 4(3)$
 $= 2(-8) + 4(3)$
 $= -16 + 12 = -4$

65. $2(4) + 3 = 8 + 3 = 11$

66. $8(6 - 2) + 3(6) = 8(4) + 3(6) = 32 + 18 = 50$

67. $5(-3) - 7 + 2(-3) = -15 - 7 - 6 = -28$

68. $6(5) - 3[2(5) + 4] = 30 - 3(10 + 4)$
 $= 30 - 3(14) = 30 - 42 = -12$

69. $3(7 + x) - 8x = 21 + 3x - 8x = 21 - 5x$

70. $2(8 + x) + 2x - x = 16 + 2x + 2x - x = 16 + 3x$

71. $4x - (6 - 3x) = 4x - 6 + 3x = 7x - 6$

72. $2x - 3(4x + 7) = 2x - 12x - 21 = -10x - 21$

73. $3(x + 9) + 2(4 - x) = 3x + 27 + 8 - 2x = x + 35$

74. $-4(x - 3) - 2(x + 7) = -4x + 12 - 2x - 14$
 $= -6x - 2$

75. $2(x^2 + 2) - x + x^2 + 7 = 2x^2 + 4 - x + x^2 + 7$
 $= 3x^2 - x + 11$

Chapter 1 continued

76. $2(x^2 - 81) - 3x^2 = 2x^2 - 162 - 3x^2 = -x^2 - 162$

77. $x^2 - 5x + 3(x^2 + 7x) = x^2 - 5x + 3x^2 + 21x$
 $= 4x^2 + 16x$

78. $4x^2 - 2(x^2 - 3x) + 6x + 8 = 4x^2 - 2x^2 + 6x + 6x + 8$
 $= 2x^2 + 12x + 8$

Technology Activity 1.3 (p. 25)

1. False; $y_1 = y_2$ when $x = -2$.

2. True; $y_1 = y_2$ when $x = 3$.

3.

x	y ₁	y ₂
-3	-2	3
-2	0	0
-1	2	-3
0	4	-6
1	6	-9
2	8	-12
3	10	-15

$x = -2$

4.

x	y ₁	y ₂
-3	16	-2
-2	12	-3
-1	8	-4
0	4	-5
1	0	-6
2	-4	-7
3	-8	-8

$x = 3$

5.

x	y ₁	y ₂
-3	1	33
-2	-1	23
-1	-3	13
0	-5	3
1	-7	-7
2	-9	-17
3	-11	-27

$x = 1$

6.

x	y ₁	y ₂
-3	22	34
-2	18	24
-1	14	14
0	10	4
1	6	-6
2	2	-16

$x = -1$

7.

x	y ₁	y ₂
-3	-48	24
-2	-33	21
-1	-18	18
0	-3	15
1	12	12
2	27	9

$x = 1$

8.

x	y ₁	y ₂
-3	-24	11
-2	-22	6
-1	-20	1
0	-18	-4
1	-16	-9
2	-14	-14

$x = 2$

Lesson 1.4

Activity (p. 26)

$2, \frac{6}{5}, 0, -\frac{8}{3}$; Method 2

1.4 Guided Practice (p. 29)

1. formula 2. B and C

3. Subtract p_2C from each side; then divide both sides by P_1 .

4. $4x + 8y = 17$

$8y = 17 - 4x$

$y = \frac{17 - 4x}{8}$

$y = -\frac{1}{2}x + \frac{17}{8}$

6. $5y - 3x = 15$

$5y = 15 + 3x$

$y = \frac{15 + 3x}{5}$

$y = \frac{3}{5}x + 3$

8. $xy + 2x = 8$

$xy = 8 - 2x$

$y = \frac{8 - 2x}{x}$

5. $5x - 3y = 9$

$-3y = 9 - 5x$

$y = -\frac{9 + 5x}{3}$

$y = \frac{5}{3}x - 3$

7. $\frac{3}{4}x + 5y = 20$

$5y = 20 - \frac{3}{4}x$

$y = -\frac{3}{20}x + 4$

9. $\frac{2}{3}x - \frac{1}{2}y = 12$

$-\frac{1}{2}y = 12 - \frac{2}{3}x$

$y = \frac{4}{3}x - 24$

10. $A = \pi ab$

$\frac{A}{\pi b} = a$

11. $a = \frac{157 \text{ in.}^2}{5\pi \text{ in.}}$

$a \approx 10 \text{ in.}$

major axis = 20 in.

1.4 Practice and Application (pp. 29-32)

12. a. $4x + 9y = 30$

$4(3) + 9y = 30$

$9y = 30 - 12$

$9y = 18$

$y = 2$

b. $4x + 9y = 30$

$9y = 30 - 4x$

$y = \frac{30 - 4x}{9}$

$y = \frac{30 - 4(3)}{9}$

$y = \frac{30 - 12}{9}$

$y = \frac{18}{9} = 2$

13. a. $5x - 7y = 12$

$5(1) - 7y = 12$

$5 - 7y = 12$

$-7y = 7$

$y = -1$

b. $5x - 7y = 12$

$-7y = 12 - 5x$

$y = -\frac{(12 - 5x)}{7}$

$y = -\frac{(12 - 5 \cdot 1)}{7}$

$y = -\frac{7}{7} = -1$

Chapter 1 continued

14. a. $xy + 3x = 25$

$$5y + 3(5) = 25$$

$$5y = 25 - 15$$

$$5y = 10$$

$$y = 2$$

b. $xy + 3x = 25$

$$xy = 25 - 3x$$

$$y = \frac{25 - 3x}{x}$$

$$y = \frac{25 - 3(5)}{5}$$

$$y = \frac{25 - 15}{5} = \frac{10}{5} = 2$$

15. a. $9y - 4x = -16$

$$9y - 4(8) = -16$$

$$9y = 16$$

$$y = \frac{16}{9}$$

b. $9y - 4x = -16$

$$9y = -16 + 4x$$

$$y = \frac{-16 + 4x}{9}$$

$$y = \frac{-16 + 4 \cdot 8}{9}$$

$$y = \frac{-16 + 32}{9} = \frac{16}{9}$$

16. a. $-y - 2x = -11$

$$-y - 2(-4) = -11$$

$$-y + 8 = -11$$

$$-y = -19$$

$$y = 19$$

b. $-y - 2x = -11$

$$-y = 2x - 11$$

$$y = -2x + 11$$

$$y = -2(-4) + 11$$

$$y = 8 + 11 = 19$$

17. a. $-x = 3y - 55$

$$-20 = 3y - 55$$

$$35 = 3y$$

$$\frac{35}{3} = y$$

b. $-x = 3y - 55$

$$55 - x = 3y$$

$$\frac{55 - x}{3} = y$$

$$\frac{55 - 20}{3} = y$$

$$\frac{35}{3} = y$$

18. a. $x = 24 + xy$

$$-12 = 24 - 12y$$

$$-36 = -12y$$

$$3 = y$$

b. $x = 24 + xy$

$$xy = x - 24$$

$$y = \frac{x - 24}{x}$$

$$y = \frac{(-12 - 24)}{-12}$$

$$y = \frac{-36}{-12} = 3$$

19. a. $-xy + 3x = 30$ b. $-xy + 3x = 30$

$$-(15)y + 3(15) = 30$$

$$-15y + 45 = 30$$

$$-15y = -15$$

$$y = 1$$

$$-xy = 30 - 3x$$

$$y = \frac{(30 - 3x)}{-x}$$

$$y = \frac{(30 - 3 \cdot 15)}{-15}$$

$$y = \frac{30 - 45}{-15}$$

$$y = \frac{-15}{-15} = 1$$

20. a. $-4x + 7y + 7 = 0$

$$-4(7) + 7y + 7 = 0$$

$$-28 + 7y + 7 = 0$$

$$7y - 21 = 0$$

$$7y = 21$$

$$y = 3$$

b. $-4x + 7y + 7 = 0$

$$7y = 4x - 7$$

$$y = \frac{4x - 7}{7}$$

$$y = \frac{(4 \cdot 7) - 7}{7}$$

$$y = \frac{28 - 7}{7}$$

$$y = \frac{21}{7} = 3$$

21. a. $6x - 5y - 44 = 0$

$$6(4) - 5y - 44 = 0$$

$$24 - 5y - 44 = 0$$

$$-5y - 20 = 0$$

$$-5y = 20$$

$$y = -4$$

b. $6x - 5y - 44 = 0$

$$-5y = 44 - 6x$$

$$y = \frac{44 - 6x}{-5}$$

$$y = \frac{44 - 6(4)}{-5}$$

$$y = \frac{44 - 24}{-5}$$

$$y = \frac{20}{-5} = -4$$

Chapter 1 continued

22. a. $\frac{1}{2}x - \frac{4}{5}y = 19$
 $\frac{1}{2}(6) - \frac{4}{5}y = 19$
 $3 - \frac{4}{5}y = 19$
 $-\frac{4}{5}y = 16$
 $y = -20$

b. $\frac{1}{2}x - \frac{4}{5}y = 19$
 $-\frac{4}{5}y = 19 - \frac{1}{2}x$
 $y = -\frac{95}{4} + \frac{5}{8}x$
 $y = -\frac{5}{4}(19 - \frac{1}{2} \cdot 6)$
 $y = -\frac{5}{4}(19 - 3)$
 $y = -\frac{5}{4} \cdot 16 = -20$

23. a. $\frac{3}{4}x = -\frac{9}{11}y + 12$
 $\frac{3}{4} \cdot 10 = -\frac{9}{11}y + 12$
 $\frac{15}{2} - 12 = -\frac{9}{11}y$
 $\frac{15 - 24}{2} = -\frac{9}{11}y$
 $-\frac{9}{2} = -\frac{9}{11}y$
 $\frac{11}{2} = y$

b. $\frac{3}{4}x = -\frac{9}{11}y + 12$
 $\frac{3}{4}x - 12 = -\frac{9}{11}y$
 $-\frac{11}{9}(\frac{3}{4}x - 12) = y$
 $-\frac{11}{9}(\frac{3}{4} \cdot 10 - 12) = y$
 $-\frac{11}{9}(\frac{15}{2} - 12) = y$
 $-\frac{11}{9}(\frac{15 - 24}{2}) = y$
 $-\frac{11}{9}(-\frac{9}{2}) = y$
 $\frac{11}{2} = y$

24. $C = 2\pi r$
 $\frac{C}{2\pi} = r$

26. $A = \frac{1}{2}bh$
 $2A = bh$
 $\frac{2A}{h} = b$

28. $F = \frac{9}{5}C + 32$
 $F - 32 = \frac{9}{5}C$
 $\frac{5}{9}(F - 32) = C$

25. $V = \frac{1}{3}\pi r^2 h$
 $3V = \pi r^2 h$
 $\frac{3V}{\pi r^2} = h$

27. $I = Prt$
 $\frac{I}{rt} = P$

29. $A = \frac{1}{2}(b_1 + b_2)h$
 $2A = (b_1 + b_2)h$
 $\frac{2A}{h} = b_1 + b_2$
 $\frac{2A}{h} - b_1 = b_2$

30. $A = 2\pi r w$

$$\frac{A}{2\pi r w} = p$$

$$\frac{22 \text{ cm}^2}{2(3.14)2 \text{ cm}} = p$$

$$\frac{22 \text{ cm}^2}{12.56 \text{ cm}} = p$$

$$1.75 \text{ cm} \approx p$$

31. $S_{\bullet} = 2\pi r h + 2\pi r^2$

$$S - 2\pi r^2 = 2\pi r h$$

$$\frac{S - 2\pi r^2}{2\pi r} = h$$

$$\frac{105 \text{ in.}^2 - 2(3.14)(3 \text{ in.})^2}{2(3.14)(3 \text{ in.})} = h$$

$$\frac{105 \text{ in.}^2 - 56.52 \text{ in.}^2}{18.84 \text{ in.}} = h$$

$$\frac{48.48 \text{ in.}^2}{18.84 \text{ in.}} = h$$

$$2.57 \text{ in.} \approx h$$

32. $P = 2\pi r + 2x$

$$P - 2x = 2\pi r$$

$$\frac{P - 2x}{2\pi} = r$$

$$\frac{440 \text{ yd} - 2(110 \text{ yd})}{2(3.14)} = r$$

$$\frac{440 \text{ yd} - 220 \text{ yd}}{6.28} = r$$

$$\frac{220 \text{ yd}}{6.28} = r$$

$$35.0 \text{ yd} \approx r$$

33. $T = m(L - 21)$

$$\frac{T}{m} = L - 21$$

$$\frac{T}{m} + 21 = L$$

35. $\frac{W}{T} \approx \frac{R^2}{R^2 + A^2}$

$$W \approx \frac{TR^2}{R^2 + A^2}$$

37. $R = p_1 V + p_2 C$

34. $L = \frac{T}{m} + 21$

$$L = \frac{500}{55} + 21$$

$$L = 9.09 + 21$$

$$L \approx 30 \text{ days}$$

36. $W \approx \frac{(162)(965)^2}{(965)^2 + (656)^2}$

$$W = \frac{(162)(931,225)}{931,225 + 430,336}$$

$$W = \frac{150,858,450}{1,361,561}$$

$$W = 110.8 \approx 111 \text{ games}$$

38. S ; R represents total revenue in dollars, p_1 is the price of a visor in dollars, V is the total number of visors sold, p_2 is the price in dollars for a baseball cap, and C is the total number of baseball caps sold.

Chapter 1 continued

39. $4480 = 3V + 7C$

$$4480 - 3V = 7C$$

$$640 - \frac{3}{7}V = C$$

b. $640 - \frac{3}{7}(280) = C$

$$640 - 120 = C$$

$$520 = C$$

280 visors, 520 caps

40. $C = 2\pi r$

$$\frac{C}{2\pi} = r$$

$$A = \pi \left(\frac{C}{2\pi} \right)^2$$

$$A = \frac{C^2}{4\pi}$$

41. $A = \frac{1}{2}bh$

$$h = \frac{\sqrt{3}}{2}b; b = \frac{2\sqrt{3}}{2}h$$

a. $A = \frac{1}{2}b \left(\frac{\sqrt{3}}{2}b \right)$

$$A = \frac{\sqrt{3}}{4}b^2$$

b. $A = \frac{1}{2} \left(\frac{2\sqrt{3}}{3}h \right) h$

$$A = \frac{\sqrt{3}}{3}h^2$$

42. $h = 3r + 5$

a. $S = 2\pi r(3r + 5) + 2\pi r^2$

$$S = 6\pi r^2 + 10\pi r + 2\pi r^2$$

$$S = 10\pi r + 8\pi r^2$$

Sample answers:

a. $640 - \frac{3}{7}(210) = C$

$$640 - 90 = C$$

$$550 = C$$

210 visors, 550 caps

c. $640 - \frac{3}{7}(1470) = C$

$$640 - 630 = C$$

$$10 = C$$

1470 visors, 10 caps

45. a. $R = 0.00256 \times D_C \times F_A \times s^2$

$$D_C = \frac{R}{0.00256 \times F_A \times s^2}$$

b. $D_C = \frac{50}{0.00256 \times 25 \times (45)^2}$

$$D_C = \frac{50}{0.00256 \times 25 \times 2025}$$

$$D_C = \frac{50}{129.6}$$

$$D_C \approx 0.386$$

1.4 Mixed Review (p. 32)

46. $1.85x$ 47. $30 - x$ 48. $55x$ 49. $250 + x$ 50. $\frac{42}{x}$

51. $2x$ 52. $\frac{7 \text{ m}}{1 \text{ min}} \times 60 \text{ min} = 420 \text{ m}$

53. $\frac{168 \text{ h}}{1 \text{ week}} \times 52 \text{ weeks} = 8736 \text{ h}$ 54. $4\frac{1}{4} \text{ ft} + 7\frac{3}{4} \text{ ft} = 12 \text{ ft}$

55. $13\frac{1}{4} \text{ L} - 8\frac{7}{8} \text{ L}$
 $12\frac{10}{8} \text{ L} - 8\frac{7}{8} \text{ L} = 4\frac{3}{8} \text{ L}$

56. $\frac{3 \text{ yd}}{1 \text{ sec}} \times 12 \text{ sec} - 10 \text{ yd} = 36 \text{ yd} - 10 \text{ yd} = 26 \text{ yd}$

57. $\frac{\$15}{1 \text{ h}} \times 8 \text{ h} + \$45 = \$120 + \$45 = \$165$

58. $3d + 16 = d - 4$

$$2d + 16 = -4$$

$$2d = -20$$

$$d = -10$$

59. $5 - x = 23 + 2x$

$$5 - 3x = 23$$

$$-3x = 18$$

$$x = -6$$

60. $10(y - 1) = y + 4$

$$10y - 10 = y + 4$$

$$9y = 10 + 4$$

$$9y = 14$$

$$y = \frac{14}{9}$$

61. $p - 16 + 4 = 4(2 - p)$

$$p - 12 = 8 - 4p$$

$$5p - 12 = 8$$

$$5p = 20$$

$$p = 4$$

62. $-10x = 5x + 5$

$$-15x = 5$$

$$x = -\frac{5}{15}$$

$$x = -\frac{1}{3}$$

63. $12z = 4z - 56$

$$8z = -56$$

$$z = -7$$

64. $\frac{2}{3}x - 7 = 1$

$$\frac{2}{3}x = 8$$

$$x = 12$$

65. $-\frac{3}{4}x + 19 = -11$

$$-\frac{3}{4}x = -30$$

$$x = 40$$

66. $\frac{1}{4}x + \frac{3}{8} = \frac{1}{5} - \frac{1}{5}x$

$$\frac{1}{4}x + \frac{1}{5}x = \frac{1}{5} - \frac{3}{8}$$

$$40\left(\frac{1}{4}x + \frac{1}{5}x\right) = \left(\frac{1}{5} - \frac{3}{8}\right)40$$

$$10x + 8x = 8 - 15$$

$$18x = -7$$

$$x = -\frac{7}{18}$$

67. $\frac{5}{4}x - \frac{3}{4} = \frac{5}{6}x + \frac{1}{2}$

$$\frac{5}{4}x - \frac{5}{6}x = \frac{3}{4} + \frac{1}{2}$$

$$12\left(\frac{5}{4}x - \frac{5}{6}x\right) = \left(\frac{3}{4} + \frac{1}{2}\right)12$$

$$15x - 10x = 9 + 6$$

$$5x = 15$$

$$x = 3$$

43. C 44. B

Chapter 1 continued

Lesson 1.5

1.5 Guided Practice (p. 37)

1. A verbal model is an equation written in words. The verbal model is used to write an algebraic model by translating the words into mathematical symbols. 2. Write out verbal model, label everything, write algebraic model, solve equation, answer the question. 3. The diagram helps you see how to express the numbers of gallons used in town in terms of x , the label given to the number of gallons used on the highway.

$$\boxed{\text{Water pressure}} = \boxed{\text{Pressure per foot of depth}} \cdot \boxed{\text{Depth}}$$

5. water pressure = $2184 \frac{\text{lb}}{\text{ft}^2}$

pressure per foot of depth = $62.4 \frac{\text{lb}}{\text{ft}^2}$

depth = d (ft)

6. $2184 = 62.4d$ 7. $d = 35$ ft

1.5 Practice and Applications (pp. 37–39)

8. distance = 547 (km); rate = $32 \left(\frac{\text{km}}{\text{h}}\right)$; time = t (h)

9. $547 = 32t$ 10. $t = \frac{547}{32} \approx 17.1$ h

11. It will take about 17 hours.

12. metronome marking = $80 \left(\frac{\text{beats}}{\text{min}}\right)$;

length of musical piece = t (min);

number of measures in piece = 180 (measures);

number of beats per measure = $3 \left(\frac{\text{beats}}{\text{measure}}\right)$

13. $80t = (180)(3)$; $80t = 540$

14. $t = 6.75$; 6 min 45 sec

15. $\boxed{\text{Total calories}} = \boxed{\text{Calories per gram of fat}} \times \boxed{\text{Number of grams of fat}} +$

$\boxed{\text{Calories per gram of protein}} \times \boxed{\text{Number of grams of protein}} + \boxed{\text{Calories per gram of carbohydrate}} \times$

$\boxed{\text{Number of grams of carbohydrates}}$

16. total calories = T ;

calories per gram of fat = 9

number of grams of fat = f ;

calories per gram of protein = 4

number of grams of protein = p ;

calories per gram of carbohydrate = 4

number of grams of carbohydrate = c ;

$T = 9f + 4p + 4c$

17. $529.9 = 9(0.3) + 4p + 4(127.7)$ 18. $20x = 529$

$529.9 = 2.7 + 4p + 510.8$

$x = 26.45$

$529.9 = 4p + 513.5$

27 weeks

$4p = 16.4$

$p = 4.1$ g

19. Total km = 37.9 km;

Great Britain rate = 0.63 km/month;

Great Britain time = x ;

France rate = 0.47 km/month;

France time = $x - 2.5$

$37.9 = 0.63x + 0.47(x - 2.5)$

$37.9 = 0.63x + 0.47x - 1.175$

$x = 35.5$

France: 35.5 months - 2.5 months = 33 months

France: $\frac{0.47 \text{ km}}{1 \text{ month}} \times 33 \text{ months} = 15.5 \text{ km}$

Great Britain: $\frac{0.63 \text{ km}}{1 \text{ month}} \times 35.5 \text{ months} = 22.4 \text{ km}$

$33 \text{ months} \times \frac{1 \text{ year}}{12 \text{ months}} = 2 \text{ years } 9 \text{ months}$

Date of completion: December 1, 1990

20. $375 = \frac{5}{8}(80) + 80x$ $375 - y = 50 + 80(4)$

$375 = 50 + 80x$

$375 - y = 370$

$80x = 325$

$-y = -5$

$x = 4.06$

$y = 5$

You have \$5 left.

You have enough to take 5 lessons (including the introductory lesson).

21. $(40)(7)(C) = 50 + 80(9) + 75 - 375$

$280C = 50 + 720 + 75 - 375$

$280C = 470$

$C = \$1.68$ per page

22. $72 = x + (x + 6)$

$72 = 2x + 6$

$66 = 2x$

$33 = x$ 39 in., 33 in.

Chapter 1 continued

23. $480 = 2w + 2(w + 30)$

$$480 = 2w + 2w + 60$$

$$420 = 4w$$

$$105 = w$$

width: 105 ft

length: 135 ft

24. 45 blocks

25. $6 \text{ m} \times 0.75 = 4.5 \text{ m}$

26. $\frac{2.88}{4} = 0.72$

$$\frac{3.85}{5} = 0.77$$

$$\frac{0.77 + 0.72}{2} = 74.5 \approx 75\%$$

27. $3 \text{ m} \times 0.75 = 2.25 \text{ m}$

$$2.25 \text{ m} \times 0.75 = 1.69 \text{ m}$$

$$1.69 \text{ m} \times 0.75 = 1.27 \text{ m}$$

$$1.27 \text{ m} \times 0.75 = 0.95 \text{ m}$$

The ball must bounce 4 times.

28. $(40)(7.50) + 5(7.50)(1.5) = I$ per week

$$300 + 56.25 = I \text{ per week}$$

$$\$356.25 = I \text{ per week}$$

$$\$356.25 \cdot 52 = I \text{ per year}$$

$$\$18,525 = I$$

D

29. $260 = \frac{1}{2}x + 5x$

$$260 = \frac{13}{2}x$$

$$x = 40$$

First lesson costs $\frac{3}{2}(40) = \$60$

D

30. Profit per

sculpture = \$6.50

Sculptures per week = 7

Number of weeks = x

$$(\$6.50)(7x) = \$360$$

$$\$45.50x = \$360$$

$$x = 7.9$$

It would take 8 weeks.

1.5 Mixed Review (p. 39)

31. true 32. true 33. false 34. false

35. $-55, -10, -5, -1, 4$ 36. $-2, -\frac{2}{3}, \frac{1}{100}, \frac{5}{8}, 1$

37. $-2.9, -2.1, -1.2, 2, 2.09$ 38. $-\sqrt{3}, 1, \sqrt{2}, \frac{8}{5}, \sqrt{10}$

39. $6x + 5 = 17$

$$6x = 12$$

$$x = 2$$

40. $5x - 4 = 7x + 12$

$$-2x - 4 = 12$$

$$-2x = 16$$

$$x = -8$$

41. $2(3x - 1) = 5 - (x + 3)$ 42. $\frac{2}{3}x + \frac{1}{4} = 2x - \frac{5}{6}$

$$6x - 2 = 5 - x - 3$$

$$7x - 2 = 2$$

$$7x = 4$$

$$x = \frac{4}{7}$$

$$\frac{2}{3}x - 2x + \frac{1}{4} = -\frac{5}{6}$$

$$-1\frac{1}{3}x = -\frac{5}{6} - \frac{1}{4}$$

$$-\frac{4}{3}x = \frac{-10-3}{12}$$

$$-\frac{4}{3}x = -\frac{13}{12}$$

$$x = \frac{13}{16}$$

Quiz 2 (p. 40)

1. $5x - 9 = 11$

$$5x = 20$$

$$x = 4$$

2. $6y + 8 = 3y - 16$

$$3y + 8 = -16$$

$$3y = -24$$

$$y = -8$$

3. $\frac{1}{4}z + \frac{2}{3} = \frac{1}{2}z - \frac{3}{4}$

$$12\left(\frac{1}{4}z + \frac{2}{3}\right) = 12\left(\frac{1}{2}z - \frac{3}{4}\right)$$

$$3z + 8 = 6z - 9$$

$$-3z + 8 = -9$$

$$-3z = -17$$

$$z = \frac{17}{3}$$

4. $0.4(x - 50) = 0.2x + 12$

$$0.4x - 20 = 0.2x + 12$$

$$0.2x - 20 = 12$$

$$0.2x = 32$$

$$x = 160$$

5. $3x + 5y = 9$

$$5y = 9 - 3x$$

$$y = \frac{9 - 3x}{5}$$

$$y = -\frac{3}{5}x + \frac{9}{5}$$

$$y = -\frac{3}{5}(2) + \frac{9}{5}$$

$$y = -\frac{6}{5} + \frac{9}{5}$$

$$y = \frac{3}{5}$$

6. $4x - 3y = 14$

$$-3y = 14 - 4x$$

$$y = \frac{4}{3}x - \frac{14}{3}$$

$$y = \frac{4}{3}(2) - \frac{14}{3}$$

$$y = \frac{8}{3} - \frac{14}{3}$$

$$y = -\frac{6}{3} = -2$$

7. $A = \frac{1}{2}d_1d_2$

$$2A = d_1d_2$$

$$\frac{2A}{d_2} = d_1$$

8. $2.80x + 16.80 = 154$

$$2.80x = 137.20$$

$$x = 49$$

She needs to sell an additional 49 boxes.

Chapter 1 continued

Math and History (p. 40)

- $700 \div 84 = 8\frac{1}{3}$ Divide 84 into 700.
- $\frac{2}{3}(400) = 267$
 $\frac{1}{2}(400) = 200$
 $\frac{1}{3}(400) = 133$
 $\frac{1}{4}(400) = 100$

Lesson 1.6

Activity (p. 41)

1. Sample answers:

$$0 < 4, -3 > -10$$

2. Sample answers:

$$0 + 2 < 4 + 2 \text{ and } -3 + 2 > -10 + 2$$

$$2 < 6 \quad \text{and} \quad -1 > -8$$

true

$$0 - 2 < 4 - 2 \text{ and } -3 - 2 > -10 - 2$$

$$-2 < 2 \quad \text{and} \quad -5 > -12$$

true

$$0(2) < 4(2) \text{ and } -3(2) > -10(2)$$

$$0 < 8 \quad \text{and} \quad -6 > -20$$

true

$$\frac{0}{2} < \frac{4}{2} \text{ and } -\frac{3}{2} > -\frac{10}{2}$$

$$0 < 2 \text{ and } -\frac{3}{2} > -5$$

true

$$0(-2) < 4(-2) \text{ and } -3(-2) > -10(-2)$$

$$0 < -8 \quad \text{and} \quad 6 > 20$$

false

$$\frac{0}{-2} < \frac{4}{-2} \text{ and } \frac{-3}{-2} > \frac{-10}{-2}$$

$$0 < -2 \text{ and } \frac{3}{2} > 5$$

false

3. If you add the same number to both sides of a true inequality, it produces another true inequality. If you subtract the same number from both sides of a true inequality, it produces another true inequality. If you multiply or divide both sides of a true inequality by the same *positive* number, it produces another true inequality. If you multiply or divide both sides of a true inequality by the same *negative* number, it does not produce another true inequality.

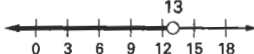
1.6 Guided Practice (p. 45)

- A simple linear inequality has only one inequality symbol, which is used to describe the relationship between two quantities or expressions. A compound linear inequality consists of two simple linear inequalities joined by "and" or "or."


- False; multiplying both sides of an inequality by the same negative number does not produce an equivalent inequality.

- In solving $2x < 7$, we divide both sides by 2 ($x < \frac{7}{2}$); but in $-2x < 7$, we divide by -2 , therefore, we need to reverse the inequality $x > -\frac{7}{2}$.

$$4. x - 5 < 8$$

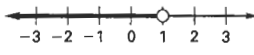
$$x < 13$$


$$5. 3x \geq 15$$

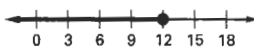
$$x \geq 5$$


$$6. -x + 4 > 3$$

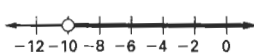
$$-x > -1$$

$$x < 1$$


$$7. \frac{1}{2}x \leq 6$$

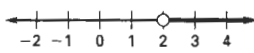
$$x \leq 12$$


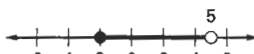
$$8. x + 8 > -2$$

$$x > -10$$


$$9. -x - 3 < -5$$

$$-x < -2$$

$$x > 2$$


$$10. -2 \leq x < 5$$


$$11. x \geq 3 \text{ or } x < -3$$


- $-50 < C < 140$
 $-50 < \frac{5}{9}(F - 32) < 140$
 $-90 < F - 32 < 252$
 $-58 < F < 284$

1.6 Practice and Applications (pp. 45-47)

13. C 14. A 15. D 16. B 17. F 18. E

$$19. 2x + 9 < 16$$

$$2x < 7$$

$$x < \frac{7}{2}$$

no

$$20. 10 - x \geq 3$$

$$-x \geq -7$$

$$x \leq 7$$

yes

$$21. 7x - 12 < 8$$

$$7x < 20$$

$$x < \frac{20}{7}$$

no

$$22. -\frac{1}{3}x - 2 \leq -4$$

$$-\frac{1}{3}x \leq -2$$

$$x \geq 6$$

yes

Chapter 1 continued

23. $-3 < 2x \leq 6$

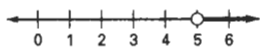
$-\frac{3}{2} < x \leq 3$

yes

25. $4x + 5 > 25$

$4x > 20$

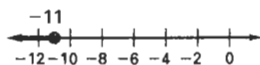
$x > 5$



27. $5 - 2x \geq 27$

$-2x \geq 22$

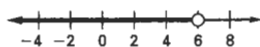
$x \leq -11$



29. $\frac{3}{2}x - 7 < 2$

$\frac{3}{2}x < 9$

$x < 6$

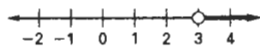


31. $4x - 1 > 14 - x$

$4x > 15 - x$

$5x > 15$

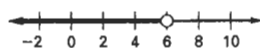
$x > 3$



33. $4.7 - 2.1x > -7.9$

$-2.1x > -12.6$

$x < 6$

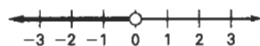


35. $2(4 - x) > 8$

$8 - 2x > 8$

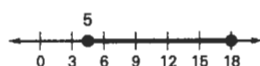
$-2x > 0$

$x < 0$



37. $-2 \leq x - 7 \leq 11$

$5 \leq x \leq 18$



24. $-8 < x - 11 < -6$

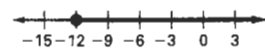
$3 < x < 5$

no

26. $7 - n \leq 19$

$-n \leq 12$

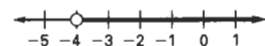
$n \geq -12$



28. $\frac{1}{2}x - 4 > -6$

$\frac{1}{2}x > -2$

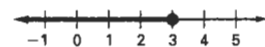
$x > -4$



30. $5 + \frac{1}{3}n \leq 6$

$\frac{1}{3}n \leq 1$

$n \leq 3$

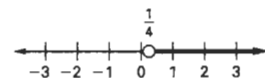


32. $-n + 6 < 7n + 4$

$-8n + 6 < 4$

$-8n < -2$

$n > \frac{1}{4}$

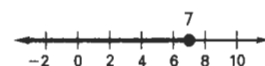


34. $2(n - 4) \leq 6$

$2n - 8 \leq 6$

$2n \leq 14$

$n \leq 7$

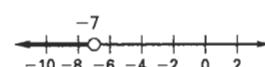


36. $5 - 5x > 4(3 - x)$

$5 - 5x > 12 - 4x$

$-x > 7$

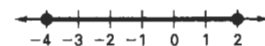
$x < -7$



38. $-16 \leq 3x - 4 \leq 2$

$-12 \leq 3x \leq 6$

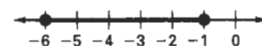
$-4 \leq x \leq 2$



39. $-5 \leq -n - 6 \leq 0$

$1 \leq -n \leq 6$

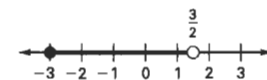
$-6 \leq n \leq -1$



40. $-2 < -2n + 1 \leq 7$

$-3 < -2n \leq 6$

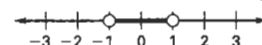
$-3 \leq n < \frac{3}{2}$



41. $-7 < 6x - 1 < 5$

$-6 < 6x < 6$

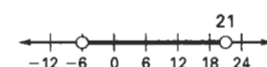
$-1 < x < 1$



42. $-8 < \frac{2}{3}x - 4 < 10$

$-4 < \frac{2}{3}x < 14$

$-6 < x < 21$



43. $x + 2 \leq 5$ or $x - 4 \geq 2$

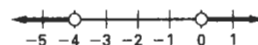
$x \leq 3$ or $x \geq 6$



44. $3x + 2 < -10$ or $2x - 4 > -4$

$3x < -12$ or $2x > 0$

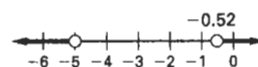
$x < -4$ or $x > 0$



45. $-5x - 4 < -1.4$ or $-2x + 1 > 11$

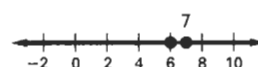
$-5x < 2.6$ or $-2x > 10$

$x > -0.52$ or $x < -5$



46. $x - 1 \leq 5$ or $x + 3 \geq 10$

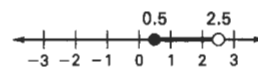
$x \leq 6$ or $x \geq 7$



47. $-0.1 \leq 3.4x - 1.8 < 6.7$

$1.7 \leq 3.4x < 8.5$

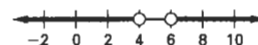
$0.5 \leq x < 2.5$



48. $0.4x + 0.6 < 2.2$ or $0.6x > 3.6$

$0.4x < 1.6$ or $x > 6$

$x < 4$ or $x > 6$



49. $\$1250 + 0.05x \geq \1500

$0.05x \geq \$250$

$x \geq \$5000$

Your sales need to be greater than or equal to \$5000.

Chapter 1 continued

50. $\$50 \leq \$25 + \$15 + \$.75x$

$\$10 \leq \$0.75x$

$13\frac{1}{3} \leq x$

You can play the game 13 times. If you play the game 13 times, pay the fee, and pay for food you will spend \$49.75.

51. $90 \leq 0.4(86) + 0.6x$

$90 \leq 34.4 + 0.6x$

$55.6 \leq 0.6x$

$92\frac{2}{3} \leq x$

Her score needs to be greater than or equal to 93, and less than or equal to 100.

52. $-89.15 \leq C \leq -31.15$

53. $-89.15 \leq K - 273.15 \leq -31.15$

$184 \leq K \leq 242$

54. Sample answer: high 80°F

low 55°F

$55^\circ \leq F \leq 80^\circ$

$55 \leq \frac{9}{5}C + 32 \leq 80$ $12.78 \leq K - 273.15 \leq 26.67$

$23 \leq \frac{9}{5}C \leq 48$ $285.93 \leq K \leq 299.82$

$12.78 \leq C \leq 26.67$

55. $6.5 < \frac{50}{30} + \frac{60}{30} + c$ 56. $5 > \frac{50}{30} + \frac{60}{30} + c$

$6.5 < 3.67 + c$

$5 > 3.67 + c$

$2.83 < c$

$1.33 > c$

57. If a , b , and c are real numbers and $a > b$, then $a - c > b - c$. If a , b , and c are real numbers such that $a > b$ and $c > 0$ then $ac > bc$. If a , b , and c are real numbers such that $a > b$ and $c > 0$ then $\frac{a}{c} > \frac{b}{c}$. If a , b , and c are real numbers such that $a > b$ and $c < 0$ then $ac < bc$. If a , b , and c are real numbers such that $a > b$ and $c < 0$ then $\frac{a}{c} < \frac{b}{c}$.

58. a. $10 < x < 160$

b. The triangle inequality theorem says that the distance between Lake Tahoe and Sanora has to be less than 160. 170 is greater than 160, therefore it must be a misprint.

c. A. $35 \text{ mi} + 65 \text{ mi} > 45 \text{ mi}$ B. $15 \text{ mi} + 50 \text{ mi} > 64 \text{ mi}$

$100 \text{ mi} > 45 \text{ mi}$

$65 \text{ mi} > 64 \text{ mi}$

okay

okay

C. $49 \text{ mi} + 28 \text{ mi} > 78 \text{ mi}$ D. $55 \text{ mi} + 72 \text{ mi} > 41 \text{ mi}$

$77 \text{ mi} > 78 \text{ mi}$

$127 \text{ mi} > 41 \text{ mi}$

not okay

okay

59. Sample answer:

$x + 1 < x$

$1 < 0$

This is a false statement, therefore $x + 1 < x$ has no solution.

60. Sample answer:

$x < x + 1$

$0 < 1$

This is a true statement, therefore all real numbers are solutions to $x < x + 1$.

1.6 Mixed Review (p. 47)

61. associative property of multiplication

62. inverse property of addition

63. commutative property of addition

64. distributive property

65. $5x + 4 = -2(x + 3)$

$5x + 4 = -2x - 6$

$7x + 4 = -6$

$7x = -10$

$x = -\frac{10}{7}$

66. $2(3 - x) = 16(x + 1)$

$6 - 2x = 16x + 16$

$-18x = 10$

$x = -\frac{10}{18}$

$x = -\frac{5}{9}$

67. $-(x - 1) + 10 = -3(x - 3)$

$-x + 1 + 10 = -3x + 9$

$-x + 11 = -3x + 9$

$2x = -2$

$x = -1$

68. $\frac{1}{8}x + \frac{3}{2} = \frac{3}{4}x - 1$

$8(\frac{1}{8}x + \frac{3}{2}) = 8(\frac{3}{4}x - 1)$

$x + 12 = 6x - 8$

$-5x = -20$

$x = 4$

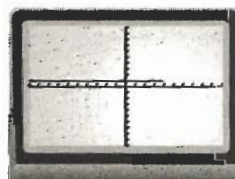
69. $t = \frac{48 \text{ mi}}{40 \text{ mi/h}}$

$t = 1\frac{1}{5} \text{ h}$

$t = 1 \text{ h } 12 \text{ min}$

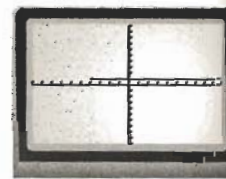
Technology 1.6 Activity (p. 48)

1. $4x - 5 \leq 11$



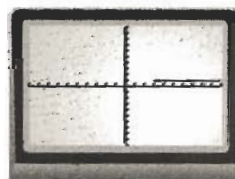
$x \leq 4$

2. $5x + 6 \geq -14$



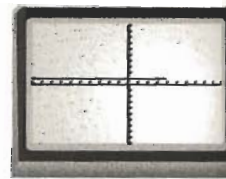
$x \geq -4$

3. $2x - 7 > -1$



$x > 3$

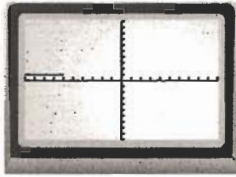
4. $4x + 2 < 18$



$x < 4$

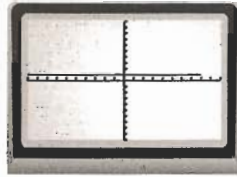
Chapter 1 continued

5. $0.5x + 2 \leq -1$



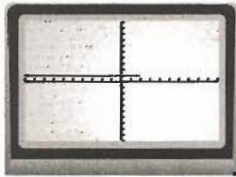
$x \leq -6$

6. $-x + 5 \geq -3$



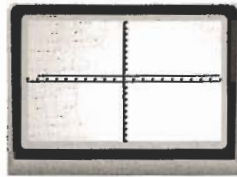
$x \leq 8$

7. $-6x + 3 > -9$



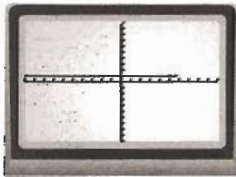
$x < 2$

8. $-0.5x - 1.5 \leq 3$



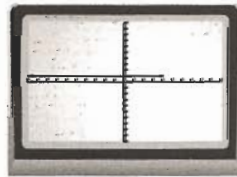
$x \geq -9$

9. $5x < 4x + 6$



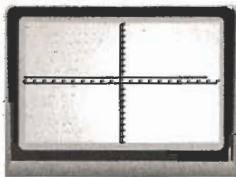
$x < 6$

10. $4 - x \geq 2 - \frac{1}{2}x$



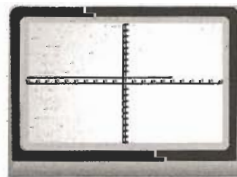
$4 \geq x$

11. $3x - 4 \leq 2x + 5$



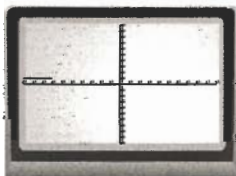
$x \leq 9$

12. $2x - 1 < \frac{7}{3} + \frac{4}{3}x$



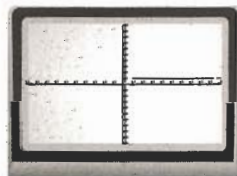
$x < 5$

13. $5 - 5x > 12 - 4x$



$x < -7$

14. $8 - 4x \leq 5 - x$



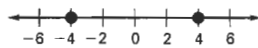
$x \geq 1$

Developing Concepts Activity 1.7 (p. 49)

Exploring the Concept

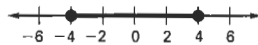
2. a. $|x| = 4$

4, -4



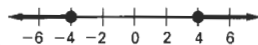
b. $|x| \leq 4$

$-4 \leq x \leq 4$



c. $|x| \geq 4$

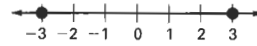
$x \leq -4$ or $x \geq 4$



d. $|3x| = 9$

$|x| = 3$

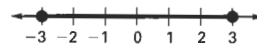
3, -3



e. $|3x| \leq 9$

$|x| \leq 3$

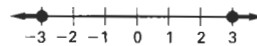
$-3 \leq x \leq 3$



f. $|3x| \geq 9$

$|x| \geq 3$

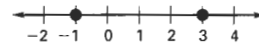
$x \leq -3$ or $x \geq 3$



g. $|x - 1| = 2$

$-x + 1 = 2$ or $x - 1 = 2$

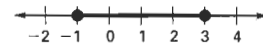
$x = -1$ or $x = 3$



h. $|x - 1| \leq 2$

$-2 \leq x - 1 \leq 2$

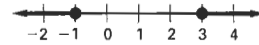
$-1 \leq x \leq 3$



i. $|x - 1| \geq 2$

$x - 1 \leq -2$ or $x - 1 \geq 2$

$x \leq -1$ or $x \geq 3$



Drawing Conclusions

1. *Sample answer:* One solution is positive and one solution is negative; no (for example, $|x - 5| = 1$ has two positive solutions); no (for example, $|x - 5| = 0$ has only one solution).
2. *Sample answer:* The solutions are compound "and" inequalities; the solutions would also use the $<$ sign.
3. *Sample answer:* The solutions are compound "or" inequalities; the solutions would also use the $>$ sign.

Lesson 1.7

1.7 Guided Practice (p. 53)

1. the number's distance from zero on a number line
2. If a is a negative number, then $-a$ is a positive number.
3. $|5| = 5$; one; -5
4. $|3x + 8| = 20$
 $|3(-4) + 8| \stackrel{?}{=} 20$
 $|-12 + 8| \stackrel{?}{=} 20$
 $4 \neq 20$
 no
5. $|11 - 4x| = 7$
 $|11 - 4(1)| \stackrel{?}{=} 7$
 $7 = 7$
 yes

Chapter 1 continued

$$6. \quad |2x - 9| = 11$$

$$|2(-1) - 9| \stackrel{?}{=} 11$$

$$|-2 - 9| \stackrel{?}{=} 11$$

$$11 = 11$$

yes

$$8. \quad |6 + 3x| = 0$$

$$|6 + 3(-2)| \stackrel{?}{=} 0$$

$$|6 + (-6)| \stackrel{?}{=} 0$$

$$0 = 0$$

yes

$$10. \quad |x + 8| < 5$$

$$-5 < x + 8 < 5$$

$$11. \quad |11 - 2x| \geq 13$$

$$11 - 2x \leq -13 \text{ or } 11 - 2x \geq 13$$

$$12. \quad |9 - x| > 21$$

$$9 - x < -21 \text{ or } 9 - x > 21$$

$$13. \quad |x + 5| \leq 9$$

$$-9 \leq x + 5 \leq 9$$

$$14. \quad |10 - 3x| \geq 17$$

$$10 - 3x \leq -17 \text{ or } 10 - 3x \geq 17$$

$$15. \quad \left| \frac{1}{4}x + 10 \right| < 18$$

$$-18 < \frac{1}{4}x + 10 < 18$$

$$16. \quad |x - 20| \leq 0.45$$

$$-0.45 \leq x - 20 \leq 0.45$$

$$19.55 \leq x \leq 20.45$$

The weight can range between 19.55 oz and 20.45 oz, inclusive.

1.7 Practice and Application (pp. 53–55)

$$17. \quad x - 8 = 11 \text{ or } x - 8 = -11$$

$$19. \quad 6n + 1 = \frac{1}{2} \text{ or } 6n + 1 = -\frac{1}{2}$$

$$21. \quad 2x + 1 = 5 \text{ or } 2x + 1 = -5$$

$$23. \quad 15 - 2x = 8 \text{ or } 15 - 2x = -8$$

$$25. \quad \frac{2}{3}x - 9 = 18 \text{ or } \frac{2}{3}x - 9 = -18$$

$$26. \quad |4x + 1| = 11$$

$$|4(3) + 1| \stackrel{?}{=} 11$$

$$13 \neq 11$$

no

$$7. \quad |-x + 9| = 4$$

$$| -(-5) + 9| \stackrel{?}{=} 4$$

$$|5 + 9| \stackrel{?}{=} 4$$

$$14 \neq 4$$

no

$$9. \quad |-5x - 3| = 8$$

$$|-5(-1) - 3| \stackrel{?}{=} 8$$

$$|5 - 3| \stackrel{?}{=} 8$$

$$2 \neq 8$$

no

$$28. \quad \left| 6 + \frac{1}{2}x \right| = 14$$

$$\left| 6 + \frac{1}{2}(-40) \right| \stackrel{?}{=} 14$$

$$|6 + (-20)| \stackrel{?}{=} 14$$

$$14 = 14$$

yes

$$30. \quad |4n + 7| = 1$$

$$|4(2) + 7| \stackrel{?}{=} 1$$

$$15 \neq 1$$

no

$$29. \quad \left| \frac{1}{5}x - 2 \right| = 4$$

$$\left| \frac{1}{5}(10) - 2 \right| \stackrel{?}{=} 4$$

$$0 \neq 4$$

no

$$31. \quad |-3x + 5| = 7$$

$$|-3(4) + 5| = 7$$

$$|-12 + 5| = 7$$

$$7 = 7$$

yes

$$32. \quad |11 + 2x| = 5$$

$$11 + 2x = 5 \quad \text{or} \quad 11 + 2x = -5$$

$$2x = -6 \quad \text{or} \quad 2x = -16$$

$$x = -3 \quad \text{or} \quad x = -8$$

$$33. \quad |10 - 4x| = 2$$

$$10 - 4x = 2 \quad \text{or} \quad 10 - 4x = -2$$

$$-4x = -8 \quad \text{or} \quad -4x = -12$$

$$x = 2 \quad \text{or} \quad x = 3$$

$$34. \quad |22 - 3n| = 5$$

$$22 - 3n = 5 \quad \text{or} \quad 22 - 3n = -5$$

$$-3n = -17 \quad \text{or} \quad -3n = -27$$

$$n = \frac{17}{3} \quad \text{or} \quad n = 9$$

$$35. \quad |2n - 5| = 7$$

$$2n - 5 = 7 \quad \text{or} \quad 2n - 5 = -7$$

$$2n = 12 \quad \text{or} \quad 2n = -2$$

$$n = 6 \quad \text{or} \quad n = -1$$

$$36. \quad |8x + 1| = 23$$

$$8x + 1 = 23 \quad \text{or} \quad 8x + 1 = -23$$

$$8x = 22 \quad \text{or} \quad 8x = -24$$

$$x = \frac{11}{4} \quad \text{or} \quad x = -3$$

$$37. \quad |30 - 7x| = 4$$

$$30 - 7x = 4 \quad \text{or} \quad 30 - 7x = -4$$

$$-7x = -26 \quad \text{or} \quad -7x = -34$$

$$x = \frac{26}{7} \quad \text{or} \quad x = \frac{34}{7}$$

$$38. \quad \left| \frac{1}{4}x - 5 \right| = 8$$

$$\frac{1}{4}x - 5 = 8 \quad \text{or} \quad \frac{1}{4}x - 5 = -8$$

$$\frac{1}{4}x = 13 \quad \text{or} \quad \frac{1}{4}x = -3$$

$$x = 52 \quad \text{or} \quad x = -12$$

$$39. \quad \left| \frac{2}{3}x + 2 \right| = 10$$

$$\frac{2}{3}x + 2 = 10 \quad \text{or} \quad \frac{2}{3}x + 2 = -10$$

$$\frac{2}{3}x = 8 \quad \text{or} \quad \frac{2}{3}x = -12$$

$$x = 12 \quad \text{or} \quad x = -18$$

Chapter 1 continued

40. $|\frac{1}{2}x - 3| = 2$
 $\frac{1}{2}x - 3 = 2$ or $\frac{1}{2}x - 3 = -2$ $-15 \leq 3 + 4x \leq 15$
 $\frac{1}{2}x = 5$ or $\frac{1}{2}x = 1$
 $x = 10$ or $x = 2$

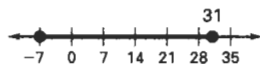
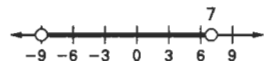
42. $|4n - 12| > 16$
 $4n - 12 < -16$ or $4n - 12 > 16$

43. $|3x + 2| < 7$
 $-7 < 3x + 2 < 7$

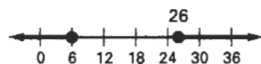
44. $|2x - 1| \geq 12$ 45. $|8 - 3n| \leq 18$
 $2x - 1 \leq -12$ or $2x - 1 \geq 12$ $-18 \leq 8 - 3n \leq 18$

46. $|11 + 4x| < 23$
 $-23 < 11 + 4x < 23$

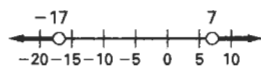
47. $|x + 1| < 8$ 48. $|12 - x| \leq 19$
 $-8 < x + 1 < 8$ $-19 \leq 12 - x \leq 19$
 $-9 < x < 7$ $-31 \leq -x \leq 7$
 $31 \geq x \geq -7$
 $-7 \leq x \leq 31$



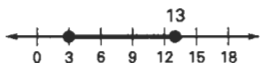
49. $|16 - x| \geq 10$
 $16 - x \geq 10$ or $16 - x \leq -10$
 $-x \geq -6$ or $-x \leq -26$
 $x \leq 6$ or $x \geq 26$



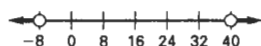
50. $|x + 5| > 12$
 $x + 5 > 12$ or $x + 5 < -12$
 $x > 7$ or $x < -17$



51. $|x - 8| \leq 5$
 $-5 \leq x - 8 \leq 5$
 $3 \leq x \leq 13$



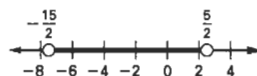
52. $|x - 16| > 24$
 $x - 16 > 24$ or $x - 16 < -24$
 $x > 40$ or $x < -8$



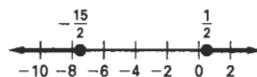
53. $|14 - 3x| > 18$
 $14 - 3x > 18$ or $14 - 3x < -18$
 $-3x > 4$ or $-3x < -32$
 $x < -\frac{4}{3}$ or $x > \frac{32}{3}$



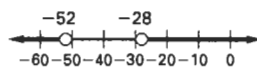
54. $|4x + 10| < 20$
 $-20 < 4x + 10 < 20$
 $-30 < 4x < 10$
 $-\frac{15}{2} < x < \frac{5}{2}$



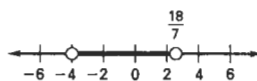
55. $|8x + 28| \geq 32$
 $8x + 28 \geq 32$ or $8x + 28 \leq -32$
 $8x \geq 4$ or $8x \leq -60$
 $x \geq \frac{1}{2}$ or $x \leq -\frac{15}{2}$



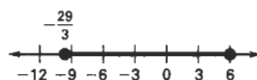
56. $|20 + \frac{1}{2}x| > 6$
 $20 + \frac{1}{2}x > 6$ or $20 + \frac{1}{2}x < -6$
 $\frac{1}{2}x > -14$ or $\frac{1}{2}x < -26$
 $x > -28$ or $x < -52$



57. $|7x + 5| < 23$
 $-23 < 7x + 5 < 23$
 $-28 < 7x < 18$
 $-4 < x < \frac{18}{7}$



58. $|11 + 6x| \leq 47$
 $-47 \leq 11 + 6x \leq 47$
 $-58 \leq 6x \leq 36$
 $-\frac{29}{3} \leq x \leq 6$



59. $|x + 1| < 3$ 60. $|\frac{2}{3}x - \frac{1}{3}| \leq \frac{1}{3}$
 $-4 < x < 2$ $0 \leq x \leq 1$

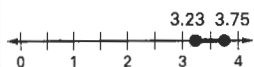
Chapter 1 continued

61. $|2x - 4| > 10$
 $x > 7$ or $x < -3$

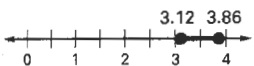
63. $|4x - 10| > 6$
 $x > 4$ or $x < 1$

64. $|1 - 2x| \geq 13$
 $x \leq 6$ or $x \geq 7$

65. $|p - 3.49| \leq 0.26$
 $-0.26 \leq p - 3.49 \leq 0.26$
 $3.23 \leq p \leq 3.75$



66. $|p - 3.49| \leq 0.37$
 $-0.37 \leq p - 3.49 \leq 0.37$
 $3.12 \leq p \leq 3.86$



67. $|x - p| \leq \frac{3}{16}$
 $-\frac{3}{16} \leq x - \frac{73}{8} \leq \frac{3}{16}$
 $8\frac{15}{16} \leq x \leq 9\frac{5}{16}$
 between $8\frac{15}{16}$ in. and $9\frac{5}{16}$ in., inclusive.

68. $|t - 89| \leq 5$

69. $|t - 98.6| \leq 1$

70. $|w - 16| \leq 0.4$

71. $24 \times 16.4 \text{ oz} = 393.6 \text{ oz}$ greatest
 $24 \times 15.6 \text{ oz} = 374.4 \text{ oz}$ least
 $|C - 384| \leq 9.6$

72.

Sport	Weight range of ball used
Volleyball	$ v - 270 \leq 10 \text{ g}$
Basketball	$ b - 625 \leq 25 \text{ g}$
Water polo	$ w - 425 \leq 25 \text{ g}$
Lacrosse	$ l - 145.5 \leq 3.5 \text{ g}$
Football	$ f - 14.5 \leq 0.5 \text{ g}$

73.

Sport	Weight range not recommended
Volleyball	$ v - 270 > 10 \text{ g}$
Basketball	$ b - 625 > 25 \text{ g}$
Water polo	$ w - 425 > 25 \text{ g}$
Lacrosse	$ l - 145.5 > 3.5 \text{ g}$
Football	$ f - 14.5 > 0.5 \text{ g}$

74. $|d - 50| \leq 50$

75. 2 L: $|c - 2000| > 9$

1 L: $|c - 1000| > 5$

500 mL: $|c - 500| > 2$

76. $|h - (2.26 \cdot 51.6 + 66.4)| \leq 3.42$
 $|h - 183| \leq 3$

$-3 \leq h - 183 \leq 3$

$180 \leq h \leq 186$

between 180 cm and 186 cm, inclusive

77. $|3x - 7| = 14$

$3x - 7 = 14$ or $3x - 7 = -14$

$3x = 21$ or $3x = -7$

$x = 7$ or $x = -\frac{7}{3}$

B

78. $|2x - 9| < 3$

$-3 < 2x - 9 < 3$

$6 < 2x < 12$

$3 < x < 6$

79. $|3x + 5| \geq 19$

$3x + 5 \leq -19$ or $3x + 5 \geq 19$

$3x \leq -24$ or $3x \geq 14$

$x \leq -8$ or $x \geq \frac{14}{3}$

B

C

80. $|2x + 3| \geq -13$

$2x + 3 \geq -13$ or $2x + 3 \leq 13$

$2x \geq -16$ or $2x \leq 10$

$x \geq -8$ or $x \leq 5$

all real numbers

81. $|5x + 2| \leq -2$

$2 \leq 5x + 2 \leq -2$

$0 \leq 5x \leq -4$

$0 \leq x \leq -\frac{4}{5}$

no solution

82. $|3x - 8| < -10$

$10 < 3x - 8 < -10$

$18 < 3x < -2$

$6 < x < -\frac{2}{3}$

no solution

83. $|4x - 2| > -6$

$4x - 2 > -6$ or $4x - 2 < 6$

$4x > -4$ or $4x < 8$

$x > -1$ or $x < 2$

all real numbers

84. $|6 - 2x| > -8$

$6 - 2x > -8$ or $6 - 2x < 8$

$-2x > -14$ or $-2x < 2$

$x < 7$ or $x > -1$

all real numbers

85. $|7 - 3x| \leq -14$

$14 \leq 7 - 3x \leq -14$

$7 \leq -3x \leq -21$

$7 \leq x \leq -\frac{3}{7}$

no solution

Chapter 1 continued

86. $|x + a| < b$

$$-b < x + a < b$$

$$-b - a < x < b - a$$

87. $|x - a| > b$

$$x - a < -b \quad \text{or} \quad x - a > b$$

$$x < a - b \quad \text{or} \quad x > b + a$$

88. $|x + a| \geq a$

$$x + a \leq -a \quad \text{or} \quad x + a \geq a$$

$$x \leq -2a \quad \text{or} \quad x \geq 0$$

89. $|x - a| \leq a$

$$-a \leq x - a \leq a$$

$$0 \leq x \leq 2a$$

1.7 Mixed Review (p. 56)

90. true 91. False; if $x = -7$, then $2x = 2(-7) = -14$,

not 14. 92. False; a rectangle is a square only when its

length and width are equal. 93. $5(6) - 9 = 21$

94. $-2(14) + 4 = -24$ 95. $11(-3) + 6 = -27$

96. $-8(-4) - 3 = 29$ 97. $61 - 11(7) + 2 = -14$

98. $15\left(\frac{1}{2}\right) + 8\left(\frac{1}{3}\right) = \frac{61}{6}$ 99. $\frac{1}{5}[8(6) + \frac{1}{3}(6)] = 10$

100. $\frac{1}{5}(5 + 3) - 7 = -\frac{27}{5}$

101. $6x + 9 > 11$

$$6x > 2$$

$$x > \frac{1}{3}$$

103. $-3x - 5 \leq 10$

$$-3x \leq 15$$

$$x \geq -5$$

105. $-18 < 2x + 10 < 6$

$$-28 < 2x < -4$$

$$-14 < x < -2$$

102. $15 - 2x \geq 45$

$$-2x \geq 30$$

$$x \leq -15$$

104. $13 + 4x < 9$

$$4x < -4$$

$$x < -1$$

106. $x + 2 \leq -1$ or $4x \geq 8$

$$x \leq -3$$
 or $x \geq 2$

Quiz 3 (p. 56)

1. $4x - 3 \leq 17$

$$4x \leq 20$$

$$x \leq 5$$



3. $-8 < 3x + 4 < 22$

$$-12 < 3x < 18$$

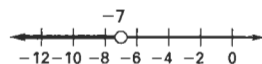
$$-4 < x < 6$$



2. $2y - 9 > 5y + 12$

$$-3y > 21$$

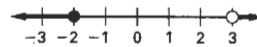
$$y < -7$$



4. $3x - 5 \leq -11$ or $2x - 3 > 3$

$$3x \leq -6 \quad \text{or} \quad 2x > 6$$

$$x \leq -2 \quad \text{or} \quad x > 3$$



5. $|x + 5| = 4$

$$x + 5 = -4 \quad \text{or} \quad x + 5 = 4$$

$$x = -9 \quad \text{or} \quad x = -1$$

6. $|x - 3| = 2$

$$x - 3 = -2 \quad \text{or} \quad x - 3 = 2$$

$$x = 1 \quad \text{or} \quad x = 5$$

7. $|6 - x| = 9$

$$6 - x = -9 \quad \text{or} \quad 6 - x = 9$$

$$-x = -15 \quad \text{or} \quad -x = 3$$

$$x = 15 \quad \text{or} \quad x = -3$$

8. $|4x - 7| = 13$

$$4x - 7 = -13 \quad \text{or} \quad 4x - 7 = 13$$

$$4x = -6 \quad \text{or} \quad 4x = 20$$

$$x = -\frac{3}{2} \quad \text{or} \quad x = 5$$

9. $|3x + 4| = 20$

$$3x + 4 = -20 \quad \text{or} \quad 3x + 4 = 20$$

$$3x = -24 \quad \text{or} \quad 3x = 16$$

$$x = -8 \quad \text{or} \quad x = \frac{16}{3}$$

10. $|15 - 3x| = 12$

$$15 - 3x = -12 \quad \text{or} \quad 15 - 3x = 12$$

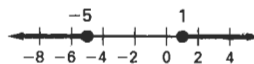
$$-3x = -27 \quad \text{or} \quad -3x = -3$$

$$x = 9 \quad \text{or} \quad x = 1$$

11. $|y + 2| \geq 3$

$$y + 2 \geq 3 \quad \text{or} \quad y + 2 \leq -3$$

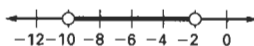
$$y \geq 1 \quad \text{or} \quad y \leq -5$$



12. $|x + 6| < 4$

$$-4 < x + 6 < 4$$

$$-10 < x < -2$$



13. $|x - 3| > 7$

$$x - 3 > 7 \quad \text{or} \quad x - 3 < -7$$

$$x > 10 \quad \text{or} \quad x < -4$$



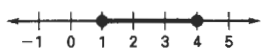
Chapter 1 continued

14. $|2y - 5| \leq 3$

$$-3 \leq 2y - 5 \leq 3$$

$$2 \leq 2y \leq 8$$

$$1 \leq y \leq 4$$

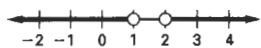


15. $|2x - 3| > 1$

$$2x - 3 > 1 \quad \text{or} \quad 2x - 3 < -1$$

$$2x > 4 \quad \text{or} \quad 2x < 2$$

$$x > 2 \quad \text{or} \quad x < 1$$

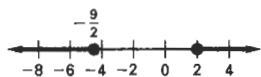


16. $|4x + 5| \geq 13$

$$4x + 5 \geq 13 \quad \text{or} \quad 4x + 5 \leq -13$$

$$4x \geq 8 \quad \text{or} \quad 4x \leq -18$$

$$x \geq 2 \quad \text{or} \quad x \leq -\frac{9}{2}$$



17. $20 \leq e \leq 28$

$$20 \text{ mi/gal} \times 16 \text{ gal} = 320 \text{ mi}$$

$$28 \text{ mi/gal} \times 16 \text{ gal} = 448 \text{ mi}$$

between 320 mi and 448 mi;
inclusive

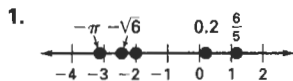
18. $|d - 30| \leq 0.045$

$$-0.045 \leq d - 30 \leq 0.045$$

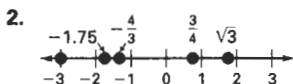
$$29.955 \leq d \leq 30.045$$

between 29.955 mm and
30.045 mm, inclusive

Chapter 1 Review (p. 58)



$$-\pi, \sqrt{6}, -2, 0.2, \frac{6}{5}$$



$$-3, -1.75, -\frac{4}{3}, \frac{3}{4}, \sqrt{3}$$

3. distributive property 4. additive inverse property

5. -18 6. 13

7. $7(-1) - 3(-1) - 8(-1)^3 = 4$

8. $3(2)(-2)^2 + 5(2)^2(-2) - 1 = -17$

9. $7y - 2x + 5x - 3y + 2x = 5x + 4y$

10. $4(3 - x) + 5(x - 6) = 12 - 4x + 5x - 30 = x - 18$

11. $6x^2 - 3x + 5x^2 + 2x = 11x^2 - x$

12. $2(x^2 + x) - 3(x^2 - 4x) = 2x^2 + 2x - 3x^2 + 12x$
 $= -x^2 + 14x$

13. $-5x + 3 = 18$

$$-5x = 15$$

$$x = -3$$

Check:

$$-5(-3) + 3 = 18$$

$$15 + 3 = 18$$

$$18 = 18$$

15. $\frac{1}{2}y = -\frac{3}{4}y - 40$

$$\frac{5}{4}y = -40$$

$$y = -32$$

Check:

$$\frac{1}{2}(-32) = -\frac{3}{4}(-32) - 40$$

$$-16 = 24 - 40$$

$$-16 = -16$$

17. $8(z - 6) = -16$

$$8z - 48 = -16$$

$$8z = 32$$

$$z = 4$$

Check:

$$8(4 - 6) = -16$$

$$8(-2) = -16$$

$$-16 = -16$$

19. $5x - y = 10$

$$-y = 10 - 5x$$

$$y = 5x - 10$$

20. $x + 4y = -8$

$$4y = -x - 8$$

$$y = -\frac{1}{4}x - 2$$

22. $2x = 3y + 9$

$$-3y = -2x + 9$$

$$y = \frac{2}{3}x - 3$$

23. $5x - 6y + 12 = 0$

$$-6y = -5x - 12$$

$$y = \frac{5}{6}x + 2$$

24. $x - 2xy = 1$

$$-2xy = 1 - x$$

$$y = -\frac{(1-x)}{2x} = \frac{x-1}{2x}$$

25. $P = 2l + 2w$

$$-2l = 2w - P$$

$$l = -w + \frac{1}{2}P$$

14. $\frac{2}{3}n - 5 = 1$

$$\frac{2}{3}n = 6$$

$$n = 9$$

Check:

$$\frac{2}{3}(9) + 5 = 1$$

$$6 + 5 = 1$$

$$1 = 1$$

16. $2 - 3a = 4 + a$

$$-4a = 2$$

$$a = -\frac{1}{2}$$

Check:

$$2 - 3\left(-\frac{1}{2}\right) = 4 - \frac{1}{2}$$

$$\frac{4}{2} + \frac{3}{2} = \frac{8}{2} - \frac{1}{2}$$

$$\frac{7}{2} = \frac{7}{2}$$

18. $-4x - 4 = 3(2 - x)$

$$-4x - 4 = 6 - 3x$$

$$-x = 10$$

$$x = -10$$

Check:

$$-4(-10) - 4 = 3(2 + 10)$$

$$40 - 4 = 3(12)$$

$$36 = 36$$

21. $0.1x + 0.5y = 3.5$

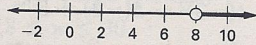
$$0.5y = -0.1x + 3.5$$

$$y = -0.2x + 7$$

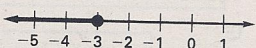
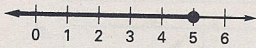
Chapter 1 continued

26. $F = \frac{9}{5}C + 32$ 27. $325 \text{ mi} = 55 \text{ mi/h}(t)$
 $-\frac{9}{5}C = 32 - F$ $t = 5 \text{ h } 55 \text{ min}$
 $C = \frac{5}{9}(F - 32)$

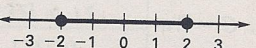
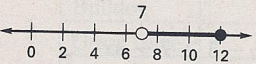
28. $\$2.95 + \$1.35d = \$21.85$ 29. $2x - 10 > 6$
 $\$1.35d = \18.90 $2x > 16$
 $d = 14 \text{ mi}$ $x > 8$



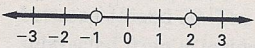
30. $12 - 5x \geq -13$ 31. $-3x + 4 \geq 2x + 19$
 $-5x \geq -25$ $-5x \geq 15$
 $x \leq 5$ $x \leq -3$



32. $0 < x - 7 \leq 5$ 33. $-3 \leq 2y + 1 \leq 5$
 $7 < x \leq 12$ $-4 \leq 2y \leq 4$
 $-2 \leq y \leq 2$



34. $3a + 1 < -2$ or $3a + 1 > 7$
 $3a < -3$ or $3a > 6$
 $a < -1$ or $a > 2$



35. $|x + 1| = 4$
 $x + 1 = 4$ or $x + 1 = -4$
 $x = 3$ or $x = -5$

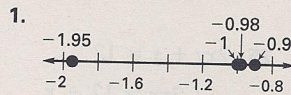
36. $|2x - 1| = 15$
 $2x - 1 = 15$ or $2x - 1 = -15$
 $2x = 16$ or $2x = -14$
 $x = 8$ or $x = -7$

37. $|10 - 6x| = 26$
 $10 - 6x = 26$ or $10 - 6x = -26$
 $-6x = 16$ or $-6x = -36$
 $x = -\frac{8}{3}$ or $x = 6$

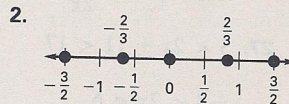
38. $|x + 8| > 0$ 39. $|2x - 5| < 9$
 $x < -8$ or $x > -8$ $-9 < 2x - 5 < 9$
 $-4 < 2x < 14$

40. $|3x + 4| \geq 2$ $-2 < x < 7$
 $3x + 4 \geq 2$ or $3x + 4 \leq -2$
 $3x \geq -2$ or $3x \leq -6$
 $x \geq -\frac{2}{3}$ or $x \leq -2$

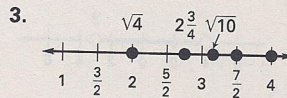
Chapter 1 Test (p. 61)



-1.95, -1, -0.98, -0.9



$-\frac{3}{2}, -\frac{2}{3}, 0, \frac{2}{3}, \frac{3}{2}$



$\sqrt{4}, 2\frac{3}{4}, \sqrt{10}, \frac{7}{2}, 4$

4. distributive property

5. commutative property of multiplication

6. additive identity

7. 15 8. 49 9. -17

10. -7 11. 24 12. $-4(-2)^2 + 6(-2)(5) = -76$

13. $\frac{3}{5}(3) - \frac{7}{2}(4) = \frac{9}{5} - \frac{28}{2} = \frac{18 - 140}{10} = -12\frac{1}{5}$

14. $-2x + 4y - 10 + x = -x + 4y - 10$

15. $4y + 6x - 3(x - 2y) = 4y + 6x - 3x + 6y$
 $= 3x + 10y$

16. $5(x^2 - 9x) - 2(3x + 4) + 7 = 5x^2 - 45x - 6x - 8 + 7$
 $= 5x^2 - 51x - 1$

17. $7x + 12 = -16$

$7x = -28$

$x = -4$

18. $1.2x = 2.3x - 2.2$

$-1.1x = -2.2$

$x = 2$

19. $4x + 21 = 7(x + 9)$

$4x + 21 = 7x + 63$

$-3x = 42$

$x = -14$

20. $|x - 4| = 15$

$x - 4 = -15$ or $x - 4 = 15$

$x = -11$ or $x = 19$

21. $|5x + 11| = 9$

$5x + 11 = 9$ or $5x + 11 = -9$

$5x = -2$ or $5x = -20$

$x = -\frac{2}{5}$ or $x = -4$

22. $|13 + 2x| = 5$

$13 + 2x = 5$ or $13 + 2x = -5$

$2x = -8$ or $2x = -18$

$x = -4$ or $x = -9$

Chapter 1 continued

23. $5x + y = 7$

$$y = 7 - 5x$$

24. $6x - 3y = 1$

$$-3y = 1 - 6x$$

$$y = -\frac{1}{3} + 2x$$

25. $2xy + x = 12$

$$2xy = 12 - x$$

$$y = \frac{12 - x}{2x}$$

26. $4x - 5 \leq 15$

$$4x \leq 20$$

$$x \leq 5$$



27. $3 < 2x + 11 < 17$

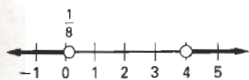
$$-8 < 2x < 6$$

$$-4 < x < 3$$



28. $8x < 1$ or $x - 9 > -5$

$$x < \frac{1}{8}$$
 or $x > 4$

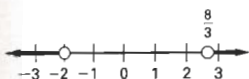


29. $|3x - 1| > 7$

$$3x - 1 > 7$$
 or $3x - 1 < -7$

$$3x > 8$$
 or $3x < -6$

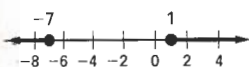
$$x > \frac{8}{3}$$
 or $x < -2$



30. $|x + 3| \geq 4$

$$x + 3 \geq 4$$
 or $x + 3 < -4$

$$x \geq 1$$
 or $x \leq -7$

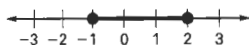


31. $|1 - 2x| \leq 3$

$$-3 \leq 1 - 2x \leq 3$$

$$-4 \leq -2x \leq 2$$

$$-1 \leq x \leq 2$$



32. $V = \pi r^2 h$

$$h = \frac{V}{\pi r^2}$$

$$h = \frac{200 \text{ cm}^3}{9\pi \text{ cm}^2} \approx 7.074 \text{ cm}$$

34. $15x = 400$

$$x \approx 26.67 \text{ weeks}$$

about 6 months

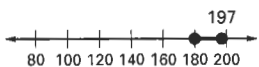
33. $\$5 + \$0.09x = \$27.23$

$$\$0.09x = \$22.23$$

$$x = 247 \text{ min}$$

35. $180 \leq T \leq 197$

Water Temperature (°F)



36. $56 - 48 = 8 \text{ in.}$

$$\left(\frac{1}{2}\right)8 \text{ in.} = 4 \text{ in.}$$

$$|h - 52| \leq 4$$

Chapter 1 Standardized Test (p. 62)

1. C 2. D 3. A 4. E

5. $4(-3)^2 - 5(-3) + 3 = 36 + 15 + 3 = 54$

C

6. $-4x + 8 = x - 7$

$$-5x = -15$$

$$x = 3$$

C

7. $21,000 + 0.025x = 52,000$

$$0.025x = 31,000$$

$$x = \$1,240,000$$

D

8. $C = 2\pi r$

$$r = \frac{C}{2\pi}$$

B

9. $6x - 3 \geq 7 + 4x$

$$2x \geq 10$$

$$x \geq 5$$

E

10. $-3 \leq -6x + 3 \leq 9$

$$-6 \leq -6x \leq 6$$

$$-1 \leq x \leq 1$$

E

11. $|5x - 2| = 8$

$$5x - 2 = 8$$
 or $5x - 2 = -8$

$$5x = 10$$
 or $5x = -6$

$$x = 2$$
 or $x = -\frac{6}{5}$

B

12. $|2x - 11| > 3$

$$2x - 11 > 3$$
 or $2x - 11 < -3$

$$2x > 14$$
 or $2x < 8$

$$x > 7$$
 or $x < 4$

E

13. B 14. B 15. C

16. a.

Distance traveled	=	Rate of fuel consumption	×	Fuel consumed
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b. distance traveled = d (mi)

rate of fuel consumption = 31 (mi/gal)

fuel consumed = 12.9 (gal)

Chapter 1 continued

- c. $d = (31)(12.9)$
d. 399.9 mi
e. You can travel almost 400 miles.
f. $d = (26 \text{ mi/gal})(12.9 \text{ gal})$
 $d = 335.4 \text{ mi}$

17. a.

Dog	Average weight range (pounds)
Beagle	$18 \leq w \leq 30$
Bloodhound	$80 \leq w \leq 100$
Bulldog	$40 \leq w \leq 50$
Great Dane	$120 \leq w \leq 150$
Mastiff	$165 \leq w \leq 185$

b.

Dog	Average weight absolute value (pounds)
Beagle	$ w - 24 \leq 6$
Bloodhound	$ w - 90 \leq 10$
Bulldog	$ w - 45 \leq 5$
Great Dane	$ w - 135 \leq 15$
Mastiff	$ w - 175 \leq 10$

- c. *Sample answer:* Using the Beagle as an example, the linear inequality $18 \leq w \leq 30$ is the solution of the absolute value inequality $|w - 24| \leq 6$. Given the first inequality, to find the second, find the midpoint between 18 and 30. The midpoint, 24, is the quantity subtracted from w inside the absolute value bars. Half the distance between 18 and 30, 6, is the amount w is allowed to vary from 24.