Study Set Section 5.1 (page 263)

1. ratio 3. cost 5. 3 7. 10 9. $\frac{11 \text{ minutes}}{60 \text{ minutes}} = \frac{11}{60}$ 11. $\frac{13}{9}$, 13 to 9, 13:9 13. $\frac{5}{7}$ 15. $\frac{1}{2}$ 17. $\frac{2}{3}$ 19. $\frac{5}{8}$ 21. $\frac{2}{7}$ 23. $\frac{1}{3}$ 25. $\frac{1}{5}$ 27. $\frac{3}{7}$ 29. $\frac{3}{4}$ 31. $1,800 33. $\frac{1}{3}$ 35. $8,750 37. $\frac{1}{5}$ 39. $\frac{32 \text{ ft}}{3 \text{ sec}}$ 41. $\frac{21 \text{ made}}{25 \text{ attempts}}$ 43. $\frac{375 \text{ students}}{2 \text{ yr}}$ 45. $\frac{3 \text{ beats}}{2 \text{ measures}}$ 47. 12 revolutions per min 49. 1.5 errors per hr 51. 7 presents per child 53. 320 people per square mile 55. $0.07 per foot 57. 1.2 cents per ounce 59. $68 per person 61. $0.8 billion per month 63. $\frac{1}{1}$

65. $\frac{3}{2}$ 67. $\frac{\frac{2}{3}}{3\frac{1}{2}}$ 69. $\frac{3 \text{ hits}}{11 \text{ at-bats}}$ 71. $\frac{5 \text{ compressions}}{2 \text{ breaths}}$ 73. $\frac{329 \text{ complaints}}{100{,}000 \text{ passengers}}$ 75. $\frac{1 \text{ faculty member}}{16 \text{ students}}$ 77. $1.89 per gal 79. 7¢ per oz 81. the 6-oz can 83. the 50-tablet boxes 85. the truck 87. 440 gal per min 89. 325 mi, 65 mph 91. the second car 97. 45.537 99. 192.7012 101. $1\frac{3}{4}$

Study Set Section 5.2 (page 273)

1. proportion 3. means 5. *ad*, *bc* 7. a. $\frac{5}{8} = \frac{15}{24}$ b. $\frac{3 \text{ teacher's aides}}{25 \text{ children}} = \frac{12 \text{ teacher's aides}}{100 \text{ children}}$ 9. i, iv 11. $18x, 288, 18, 18$ 13. no 15. yes 17. no 19. yes 21. no 23. yes 25. 4 27. 6 29. 3 31. 9 33. 0 35. -17 37. $-\frac{3}{2}$ 39. $\frac{83}{2}$ 41. $3,500 43. 5.625 45. $218.75 47. $11.76 49. the same 51. 24 53. 975 55. about $4\frac{1}{4}$ 57. 19 sec 59. 221 mi 61. $309 63. 10 ft 65. 65.25 ft = 65 ft 3 in. 67. 2.625 in. = $2\frac{5}{8}$ in. 73. 90% 75. $\frac{1}{3}$ 77. 2.6

Study Set Section 5.3 (page 283)

1. length 3. l 5. capacity 7. l 9. 5,280 11. 16 13. 8 15. 1 17. 24 19. $\frac{5}{8}$ in., $1\frac{3}{4}$ in., $2\frac{5}{16}$ in. 21. a. $\frac{1 \text{ ton}}{2{,}000 \text{ lb}}$ b. $\frac{2 \text{ pt}}{1 \text{ qt}}$ 23. a. iv b. i c. ii d. iii 25. a. iii b. iv c. i d. ii 27. 36, 36 29. 2, 4, 12 31. $2\frac{5}{8}$ in. 33. $10\frac{3}{4}$ in. 35. 48 in. 37. 42 in. 39. 2 ft 41. 288 in. 43. 2.5 yd 45. $4\frac{2}{3}$ ft 47. 15 ft 49. $2\frac{1}{3}$ yd 51. 3 mi 53. 2,640 ft 55. 5 lb 57. 3.5 tons 59. 24,800 lb 61. 6 pt 63. 2 gal 65. 2 pt 67. 4 hr 69. 5 days 71. 150 yd 73. 2,880 in. 75. 0.28 mi 77. 61,600 yd 79. 128 oz 81. 4.95 tons 83. 68 85. $71\frac{7}{8}$ gal = 71.875 gal 87. 320 oz 89. $6\frac{1}{8}$ days = 6.125 days 93. 3,700 95. 3,673.26 97. 0.101 99. 0.1

Study Set Section 5.4 (page 293)

1. tens 3. thousands 5. hundredths 7. metric 9. 1 cm, 3 cm, 6 cm 11. a. $\frac{1 \text{ km}}{1{,}000 \text{ m}}$ b. $\frac{100 \text{ cg}}{1 \text{ g}}$ c. $\frac{1{,}000 \text{ milliliters}}{1 \text{ liter}}$ 13. a. iii b. i c. ii 15. a. ii b. iii c. i 17. 10 19. $\frac{1}{100}$ 21. $\frac{1}{1{,}000}$ 23. 1,000 25. 1,000 27. 1,000 29. $\frac{1}{100}$ 31. 1 33. 1, 100 35. 1,000, 1, 1,000 37. 156 mm 39. 28 cm 41. 300 43. 570 45. 3.1 47. 7,680,000 49. 0.472 51. 4.532 53. 0.0325 55. 37.5 57. 125 59. 675,000 61. 6.383 63. 0.63 65. 69.5 67. 5.689 69. 5.762 71. 0.000645 73. 0.65823 75. 3,000 77. 2,000 79. 1,000,000 81. 0.5 83. 3,000 85. 5,000 87. 10 89. 0.5 km, 1 km, 1.5 km, 5 km, 10 km 91. 12 cm, 8 cm 93. 400,000 cg 95. 40 dL 97. 4 99. 3 g 105. $23.99 107. $402 109. $11\frac{10}{21}$

Study Set Section 5.5 (page 301)

1. Fahrenheit 3. a. meter b. meter c. inch d. mile 5. a. liter b. liter c. gallon 7. 0.3048, 1,371.6 9. 0.264 11. 91.4 13. 147.6 15. 39,372 17. 127 19. 1 21. 11,350 23. 17.6 25. 0.6 27. 0.1 29. 243.4 31. 710 33. 0.5 35. 10° 37. 122° 39. 14° 41. $-20.6°$ 43. 5 mi 45. 70 mph 47. 1.9 km 49. 1.9 cm 51. 181.5 lb, 291.5 lb, 242 lb, 594 lb 53. a. 226.8 g b. 0.24 L 55. no 57. the 3 quarts 59. 62° C 61. 28° C 63. $-5°$ C and 0° C 69. $5y + 4$ 71. $-7x$ 73. x^3 75. $15b^2$

Key Concept (page 304)

3. 10,800 ft

Chapter Review (page 306)

1. a. $\frac{1}{3}$ b. $\frac{1}{4}$ c. $\frac{3}{2}$ d. $\frac{2}{3}$ 2. $\frac{37}{32}$ 3. $7.75 4. the 8-oz can 5. a. 75 b. 15 6. a. no b. yes 7. a. yes b. no 8. a. 4.5 b. 16 c. 0 d. $-\frac{35}{9}$ 9. 192.5 mi 10. 300 11. 12 ft 12. $1\frac{1}{2}$ in. 13. $\frac{1 \text{ mi}}{5{,}280 \text{ ft}} = 1$, $\frac{5{,}280 \text{ ft}}{1 \text{ mi}} = 1$ 14. a. 15 ft b. 216 in. c. 5.5 ft d. 306 in. e. 1.75 mi f. 1,760 yd 15. a. 2 lb b. 275.2 oz c. 96,000 oz d. 2.25 tons 16. a. 80 fl oz b. 0.5 gal c. 68 c d. 5.5 qt e. 40 pt f. 56 c 17. a. 1,200 sec b. 15 min c. $8\frac{1}{3}$ days d. 360 min e. 108 hr f. 86,400 sec 18. $484\frac{2}{3}$ yd 19. 100 20. 4 cm 21. $\frac{1 \text{ km}}{1{,}000 \text{ m}} = 1$, $\frac{1{,}000 \text{ m}}{1 \text{ km}} = 1$ 22. a. 4.75 m b. 8,000 mm c. 0.03 km d. 2,000 dm e. 50 hm f. 25 hm 23. a. 70 mg b. 8 g c. 5.425 kg d. 5,425,000 mg e. 7.5 g f. 0.05 kg 24. 50 25. a. 1.5 L b. 3.25 kL c. 1,000 dL d. 40 cL e. 20 hL f. 400 mL 26. 1,000 mL 27. 164.04 ft 28. the World Trade Center 29. 3,106 km 30. 198.12 cm 31. a. 850.5 g b. 33 lb c. 11,000 g d. 910 kg 32. about 2 lb 33. LaCroix 34. the 5-liter bottle 35. 25° C 36. 30° C

Chapter 5 Test (page 311)

1. $\frac{3}{4}$ 2. $\frac{1}{6}$ 3. the 2-pound can 4. 22.5 kwh per day 5. $\frac{1}{1}$, 1:1, 1 to 1 6. no 7. yes 8. yes 9. 15 10. 63.24 11. 11 12. 3 13. $3.43 14. $1\frac{2}{3}$ c 15. 15 ft 16. $8\frac{1}{3}$ yd 17. 160 oz 18. 3,200 lb 19. 128 fl oz 20. 115,200 min 21. the one on the left 22. the blue one 23. the right side 24. 0.5 km 25. 500 cm 26. 0.08 kg 27. 70,000 mL 28. 7.5 g 29. the 100-yd race 30. Jim 31. the one-liter bottle 32. 182° F 33. A scale is a ratio (or rate) comparing the size of a drawing and the size of an actual object. For example, 1 inch to 6 feet (1 in.:6 ft). 34. It is easier to convert from one unit to another in the metric system, because it is based on the number 10.

Study Set Section 2.1 (page 153)

1. expression **3.** variable **5.** $10 + 3x$, $\frac{10-x}{3}$ (answers may vary) **7.** Mr. Lamb; 15 mi **9.** $2p$, $3p$ **11.** 500, $500 + x$, $500 - x$ **13.** $\frac{h}{4}$ **15.** $450 - x$ **17.** $8x$ **19.** $\frac{10}{s}$ **21.** $x - 9$ **23.** $\frac{2}{3}p$ **25.** $6 + r$ **27.** $d - 15$ **29.** $1 - s$ **31.** $2p$ **33.** $s + 14$ **35.** $\frac{35}{b}$ **37.** $x - 2$ **39.** c increased by 7 **41.** 7 less than c **43.** a. $60m$ b. $3{,}600h$ **45.** a. $\frac{c}{12}$ b. $\frac{s}{52}$ **47.** a. $12f$ in. b. $\frac{f}{3}$ yd **49.** $j - 5$ **51.** $6s$ **53.** $\frac{p}{15}$ days **55.** $t + 2$ **57.** w = width, $w + 6$ = length **59.** g = gal drained out; $6 - g$ = gal remaining **61.** $3x + 5$ **63.** $10a + 12$ **65.** x = votes received by Nixon; $x + 118{,}550$ = votes received by Kennedy **67.** c = number of copies of *I Want to Hold Your Hand* sold, $c - 2{,}000{,}000$ = number of copies of *Hey Jude* sold **73.** -10 **75.** -4 **77.** $\{\ldots, -3, -2, -1, 0, 1, 2, 3, \ldots\}$ **79.** 2

Study Set Section 2.2 (page 165)

1. formula **3.** substitute **5.** $2 - 8 + 10$; it looks like subtraction **7.** a. x = length part 1; $x - 40$ = length part 2, $x + 16$ = length part 3 (answers may vary) b. 20 in. and 76 in. **9.** a. 22, 27 b. $T = p + 2$ **11.** 48, $3t$, $3x$ **13.** a. health club instructor b. mechanic c. paleontologist d. realtor e. doctor f. economist **15.** a. $d = rt$ b. $C = \frac{5(F-32)}{9}$ c. $d = 16t^2$ **17.** 17 **19.** 4 **21.** 40 **23.** -6 **25.** -6 **27.** 23 **29.** -8 **31.** 100 **33.** -28 **35.** 3 **37.** 44 **39.** -21 **41.** -3 **43.** -7 **45.** -18 **47.** 25 **49.** 21 **51.** -5 **53.** -29 **55.** -45 **57.** 21 **59.** 70 cents **61.** \$8,200 **63.** \$23 **65.** 300 mi **67.** $-10°$ C **69.** 239 **71.** 64 ft **73.** 5,213, 5,079, 4,814; 2,053, 2,051, 1,921; 3,160, 3,028, 2,893 **75.** 30°, 15°, $-5°$ **77.** 16, 16 ft; 64, 48 ft; 144, 80 ft; 256, 112 ft **79.** 4 **87.** 17, 37, 41 **89.** 7 **91.** division by 3 **93.** 3

Study Set Section 2.3 (page 176)

1. distributive, removed **3.** equivalent **5.** $x(y + z) = xy + xz$ **7.** $(w + 7)5$ **9.** 5, 6, 6, 2, 3 **11.** $-y - 9$ **13.** -5 **15.** -9, -9, $-45y$ **17.** a. x b. $x + 5$ c. $5x - 10y - 15$ d. $5x$ **19.** $12x$ **21.** $-30y$ **23.** $100t$ **25.** $12s$ **27.** $14c$ **29.** $-40h$ **31.** $-42xy$ **33.** $16rs$ **35.** $30xy$ **37.** $-30br$ **39.** $80c$ **41.** $-8e$ **43.** $4x + 4$ **45.** $16 - 4x$ **47.** $-6e - 6$ **49.** $-16q + 48$ **51.** $12 + 20s$ **53.** $42 + 24d$ **55.** $-25r + 30$ **57.** $-24 - 18d$ **59.** $9x - 21y + 6$ **61.** $9z + 9x + 15y$ **63.** $-x - 3$ **65.** $-4t - 5$ **67.** $3w + 4$ **69.** $-5x + 4y - 1$ **71.** $2(4x + 5)$ **73.** $(-4 - 3x)5$ **75.** $-3(4y - 2)$ **77.** $3(4 - 7t - 5s)$ **83.** 5 **85.** multiplication, division, subtraction, addition **87.** > **89.** carpeting, painting

Study Set Section 2.4 (page 188)

1. term **3.** perimeter **5.** distributive **7.** combining **9.** a. term b. factor c. factor d. factor **11.** a. 11 b. 8 c. -4 d. 1 e. -1 f. 102 **13.** 6, m; -7, t; 1, w; 4, bh **15.** It helps identify the like terms. **17.** $(2d + 15)$ mi **19.** To add the like terms, add 9 and 5 and keep the variable. **21.** 7 **23.** 2 **25.** a. the perimeter of a rectangle b. 2 times the length c. 2 times the width **27.** $3x^2$, $-5x$, 4 **29.** 5, $5t$, $-8t$, 4 **31.** 2 **33.** 5 **35.** $15t$ **37.** $4s$ **39.** x **41.** $4d$ **43.** $-4e$ **45.** cannot be simplified **47.** $-6z$ **49.** $-7x$ **51.** 0 **53.** 0 **55.** $4x$ **57.** cannot be simplified **59.** $-2y$ **61.** $3a$ **63.** $11t + 12$ **65.** $2w - 5$ **67.** $-7r + 11R$ **69.** $-50d$ **71.** $8x - 4y - 9$ **73.** $9x + 34$ **75.** $-22s + 23$ **77.** $19e - 21$ **79.** $2t + 8$ **81.** $3x + 8$ **83.** $10y - 32$ **85.** \$288 **87.** 36 ft, 48 ft, 60 ft, 72 ft, 84 ft **93.** 2 **95.** $2^2 \cdot 5^2$ **97.** absolute value

Study Set Section 2.5 (page 186)

1. solve **3.** distributive **5.** combine **7.** When we substitute -5 for x, the result is a false statement: $-10 = -9$. **9.** $5k$ **11.** a. $4x$ b. $2x$ **13.** a. $2t - 8$ b. -4 c. -16 **15.** $2x$, 2, 2 **17.** 9, 45, 45, 45, $5x$, 5, 5 **19.** yes **21.** no **23.** 6 **25.** 3 **27.** -30 **29.** -28 **31.** 42 **33.** 37 **35.** 306 **37.** 735 **39.** 2 **41.** -14 **43.** -8 **45.** 5 **47.** -12 **49.** 4 **51.** 8 **53.** 10 **55.** 6 **57.** 0 **59.** -4 **61.** -10 **63.** 0 **65.** 1 **67.** 2 **69.** -11 **71.** 26 **73.** -3 **75.** 7 **77.** 3 **83.** -16 **85.** -387.5 **89.** positive

Study Set Section 2.6 (page 198)

1. addition **3.** $5x$ **5.** $g - 100$ **7.** $3m$ **9.** $2w$ **11.** 30, 24, $5x$, $4(9 - x)$ **13.** a. 9 b. $9 - d$ **17.** 17 mo **19.** 11 yr **21.** \$975 **23.** 61 **25.** 400 gal **27.** 21 mi **29.** 10 ft **31.** 6 min **33.** 6 pairs of dress shoes, 3 pairs of athletic shoes **35.** 14 hr, 6 hr **41.** associative property of addition **43.** -100 **45.** addition **47.** $2^3 \cdot 5^2$

Key Concept (page 194)

1. parentheses, innermost, outermost **3.** multiplications, divisions **5.** -15 **7.** 0 **9.** 206 **11.** -15 **13.** 92 ft **15.** $3x$ **17.** no **19.** Undo the subtraction first. Then undo the multiplication.

Chapter Review (page 199)

1. a. Brandon is closer by 250 mi. b. $h + 7$ **2.** a. $n - 5$ b. $7x$ c. $\frac{6}{p}$ d. $s + (-15)$ e. $2l$ f. $D - 100$ g. $r + 2$ h. $\frac{45}{x}$ **3.** a. $\frac{c}{6}$ b. 1,000 $- x$ dollars **4.** a. x = hours wife drove; $2x$ = hours husband drove b. w = width; length = $w + 3$ **5.** a. $12x$ b. $\frac{d}{7}$ **6.** a. h = height of wall, upper base = $h - 5$, lower base = $2h - 3$ b. upper base = 5 ft, lower base = 17 ft **7.** a. 12 b. -8 c. 100 d. -4 **8.** 130, 114, $6x$, $55t$ **9.** \$278 **10.** \$15,230 **11.** a. 1998 b. 2000 c. They decreased. **12.** The pool is 2° C warmer. **13.** 144 ft **14.** 24 yr **15.** a. $-10x$ b. $42xy$ c. $60de$ d. $32s$ e. $2e$ f. $49xy$ g. $84k$ h. $100t$ **16.** a. $4y + 20$ b. $-30t - 45$ c. $-21 - 21x$ d. $-12e + 24x + 3$ **17.** a. $-6t + 4$ b. $-5 - x$ c. $-6t + 3s - 1$ d. $5a + 3$ **18.** a. $-4x$, 8 b. $-3y$, 1 **19.** a. factor b. term c. factor d. term **20.** a. yes b. no c. yes d. no **21.** a. $7x$ b. $-9t$ c. $-3z$ d. $5x$ e. $-12y$ f. $w - 5$ g. $-46d + 2a$ b. $10y + 15h - 1$ **22.** a. $13y + 48$ b. $-5t + 22$ c. $3x + 12$ d. $-50f + 84$ e. $-14m$ f. $14m$ **23.** 194 **24.** yes **25.** a. -18 b. 8 c. -3 d. 15 e. -3 f. 2 g. -3 h. 4 **26.** 10, 60; 25, 175; 1, x; 5, $5n$ **27.** $56 - c$ **28.** 6 hr **29.** 13 mi **30.** 2,200 **31.** 15 \$3 drinks, 35 \$4 drinks

Chapter 2 Test (page 205)

1. a. $r - 2$ b. $3xy$ **2.** 51,000 $- e$ = yearly earnings of husband **3.** a. -3 b. 26 **4.** 165 mi **5.** \$37,000 **6.** It would be 56 ft short of hitting the ground. **7.** 1 **8.** 250 ft **9.** 15° C **10.** a. $25x + 5$ b. $-42 + 6x$ c. $-6y - 4$ d. $6a + 9b - 21$ a. factor b. term **12.** a. $-28y + 10$ b. $-3t$ **13.** a. $8x^2$, $-4x$, -6 b. 8 **14.** a. $11x$ b. $24ce$ c. $5x$ d. $30y$ e. $-7x$ f. $9y$ **15.** $-6y - 3$ **16.** -9 **17.** -3 **18.** 4 **19.** -10 **20.** a. $10k¢$ b. $20(p + 2)$ dollars **21.** 3 hr **22.** 8 hr **23.** terms with exactly the same variables and exponents **24.** t = length trout, $t + 10$ = length salmon; s = length salmon, $s - 10$ = length trout **25.** No; we simplify expressions, and we solve equations **26.** $2(x + 3) = 2x + 6$ (answers may vary)