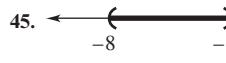
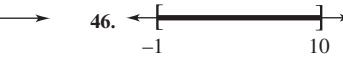
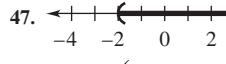
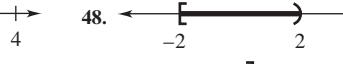
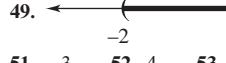


Answers for Chapter 1

Section 1.1 (Page 8)

1. True 2. False 3. Answers vary, but 2,508,429,787/798,458,000 is the best. 4. Commutative property of addition 5. Distributive property 6. Commutative property of addition 7. Identity property of addition 8. Multiplicative inverse property 9. Associative property of addition 10. Identity property of multiplication
 11. Answers vary. 12. Answers vary. 13. -39 14. 16
 15. -2 16. 9/4 17. 45.6 18. 9.6 19. about .9167
 20. 1.1 21. -12 22. 4 23. 0 24. -4 25. 4
 26. -4 27. -1 28. 3 29. $\frac{2040}{523}, \frac{189}{37}, \sqrt{27}, \frac{4587}{691}, 6.735, \sqrt{47}$
 30. $\frac{187}{63}, 2.9884, \sqrt{\sqrt{85}}, \pi, \sqrt{10}, \frac{385}{117}$ 31. $12 < 18.5$
 32. $-2 > -20$ 33. $x \geq 5.7$ 34. $y \leq -5$ 35. $z \leq 7.5$
 36. $w < 0$ 37. $<$ 38. $<$ 39. $=$ 40. $>$
 41. a lies to the right of b or is equal to b . 42. $b + c = a$
 43. $c < a < b$ 44. a lies to the right of 0.
 45. 
 46. 
 47. 
 48. 
 49. 
 50. 
 51. -3 52. 4 53. -19 54. -22 55. = 56. <
 57. = 58. = 59. = 60. = 61. > 62. < 63. $7 - a$
 64. $b - c$ 65. Answers vary. 66. Answers vary. 67. Answers vary.
 68. $|x - 63.5| \leq 8.4; |x - 68.9| \leq 9.3$ 69. 1 70. 8 71. 9 72. 4
 73. 4 74. 8 75. 4.3 76. 71.1 77. 64.1 78. 16.3
 79. 2.3 80. 4.7 81. 2010, 2015, 2016 82. 2010, 2011, 2012,
 2013, 2014, 2015, 2016 83. 2010, 2011, 2012, 2013, 2014, 2015
 84. 2014, 2015, 2016

Section 1.2 (Page 16)

1. 1,973,822,685 2. -936,171,103.1 3. 289,099,1339
 4. .0163339967 5. Answers vary. 6. Answers vary. 7. 4⁵
 8. $(-4)^{10}$ 9. $(-6)^7$ 10. $(2z)^{11}$ 11. $(5u)^{28}$ 12. $(6y)^{23}$
 13. Degree 4; coefficients: 6.2, -5, 4, -3, 3.7; constant term 3.7
 14. Degree 7; coefficients: 6, 4, 0, 0, -1, 0, 1, 0, constant term 0
 15. 3 16. 5 17. $-x^3 + x^2 - 13x$ 18. $-2p^3 - 4p^2 + 3p + 9$
 19. $-6y^2 + 3y + 6$ 20. $4b^2 + 1$ 21. $-6x^2 + 4x - 4$
 22. $3y^3 + 13y^2 - 21y + 14$ 23. $-18m^3 - 54m^2 + 9m$
 24. $8a^3 - 12a^2 + 16a$ 25. $12z^3 + 14z^2 - 7z + 5$
 26. $8k^4 + 6k^3 - 7k^2 + 3k$ 27. $12k^2 + 16k - 3$ 28. $8r^2 - 5r - 3$
 29. $6y^2 + 13y + 5$ 30. $25r^2 - 35rs + 12s^2$ 31. $18k^2 - 7kq - q^2$
 32. $.0036x^2 - .04452x - .0918$ 33. $4.34m^2 + 5.68m - 4.42$
 34. $14p + 3$ 35. $-k + 3$ 36. $-x^2 - 15x - 27$
 37. $R = 5000x$; $C = 200,000 + 1800x$; $P = 3200x - 200,000$
 38. $R = 8500x$; $C = 225,000 + 4200x$; $P = 4300x - 225,000$
 39. $R = 9750x$; $C = -3x^2 + 3480x + 259,675$;
 $P = 3x^2 + 6270x - 259,675$
 40. $R = 23,500x$; $C = -4.2x^2 + 3220x + 144,575$;
 $P = 4.2x^2 + 20,280x - 144,575$
 41. (a) \$673 million (b) About \$505 million 42. (a) \$2757 million
 (b) About \$2301 million 43. (a) \$1384 million (b) About \$1022 million
 44. (a) \$8 million (b) About 1310 million 45. About \$4036 million
 46. About \$5254 million 47. About \$6745 million 48. Answers vary.

49. False 50. True 51. False 52. True 53. About \$20,663 million 54. \$29,387 million 55. About \$34,896 million
 56. About \$33,958 million 57. 2013 58. 2012 59. -100,375;
 \$96,220; Answers vary. 60. Between 40,000 and 45,000 calculators
 61. \$342,500 62. \$682,750

Section 1.3 (Page 23)

1. $12x(x - 2)$ 2. $5y(1 - 13x)$ 3. $r(r^2 - 5r + 1)$
 4. $t(t^2 + 3t + 8)$ 5. $6z(z^2 - 2z + 3)$ 6. $5x(x^2 + 11x + 2)$
 7. $(2y - 1)^2(14y - 4) = 2(2y - 1)^2(7y - 2)$
 8. $(3x + 7)^3(9x^2 + 42x + 45)$ 9. $(x + 5)^4(x^2 + 10x + 28)$
 10. $3(x + 6)^2(2x^2 + 24x + 73)$ 11. $(x + 1)(x + 4)$
 12. $(u + 1)(u + 6)$ 13. $(x + 3)(x + 4)$ 14. $(y + 2)(y + 6)$
 15. $(x + 3)(x - 2)$ 16. $(x - 1)(x + 5)$ 17. $(x - 1)(x + 3)$
 18. $(y + 4)(y - 3)$ 19. $(x - 4)(x + 1)$ 20. $(u - 4)(u + 2)$
 21. $(z - 7)(z - 2)$ 22. $(w - 8)(w + 2)$ 23. $(z + 4)(z + 6)$
 24. $(r + 6)(r + 10)$ 25. $(2x - 1)(x - 4)$ 26. $(3w - 2)(w - 2)$
 27. $(3p - 4)(5p - 1)$ 28. $(4x - 1)(2x - 3)$
 29. $(2z - 5)(2z - 3)$ 30. $(3y - 5)(4y - 3)$
 31. $(2x + 1)(3x - 4)$ 32. $(4z - 1)(3z + 1)$
 33. $(5y - 2)(2y + 5)$ 34. $(5u - 2)(3u + 2)$
 35. $(2x - 1)(3x + 4)$ 36. $(3y - 2)(4y + 5)$
 37. $(3a + 5)(a - 1)$ 38. $6(a - 10)(a + 2)$ 39. $(x + 9)(x - 9)$
 40. $(x + 8y)(x + 9y)$ 41. $(3p - 2)^2$ 42. $(3r + 2)(r - 1)$
 43. $(r - 2t)(r + 5t)$ 44. $(2a - 3b)(a + 2b)$ 45. $(m - 4n)^2$
 46. $2(2k + 1)(2k - 5)$ 47. $(2u + 3)^2$ 48. $(3p + 4)(3p - 4)$
 49. Cannot be factored. 50. $(5x - 1)(2x - 3)$
 51. $(2r + 3v)(2r - 3v)$ 52. $(x + 7y)(x - 4y)$ 53. $(x + 2y)^2$
 54. $2(4u - 3)(2u + 3)$ 55. $(3a + 5)(a - 6)$
 56. $(3k - 4)(k + 2)$ 57. $(7m + 2n)(3m + n)$
 58. $(9y + 10)(9y - 10)$ 59. $(y - 7z)(y + 3z)$
 60. Cannot be factored. 61. $(11x + 8)(11x - 8)$
 62. $4(z + 7y)^2$ 63. $(a - 4)(a^2 + 4a + 16)$
 64. $(b + 6)(b^2 - 6b + 36)$ 65. $(2r - 3s)(4r^2 + 6rs + 9s^2)$
 66. $(10p + 3q)(100p^2 - 30pq + 9q^2)$
 67. $(4m + 5)(16m^2 - 20m + 25)$ 68. $(6y - 7)(36y^2 + 42y + 49)$
 69. $(10y - z)(100y^2 + 10yz + z^2)$
 70. $(5p + 2q)(25p^2 - 10pq + 4q^2)$ 71. $(x^2 + 3)(x^2 + 2)$
 72. $(y^2 + 2)(y^2 + 5)$ 73. $b^2(b + 1)(b - 1)$
 74. $(z + 2)(z - 2)(z^2 + 1)$ 75. $(x + 2)(x - 2)(x^2 + 3)$
 76. $(2x + 3)(2x - 3)(x^2 + 9)$ 77. $(4a^2 + 9b^2)(2a + 3b)(2a - 3b)$
 78. $(x + y)(x^2 - xy + y^2)(x - y)(x^2 + xy + y^2)$
 79. $x^2(x^2 + 2)(x^4 - 2x^2 + 4)$
 80. $x^3(x + 2)(x^2 - 2x + 4)(x - 2)(x^2 + 2x + 4)$
 81. Answers vary. 82. Answers vary. 83. Answers vary.
 84. Answers vary.

Section 1.4 (Page 29)

1. $\frac{x}{7}$ 2. $\frac{1}{3m^2}$ 3. $\frac{5}{7p}$ 4. $\frac{3y^2}{4}$ 5. $\frac{5}{4}$ 6. $\frac{1}{2}$ 7. $\frac{4}{w + 6}$
 8. $-\frac{6}{x + 4}$ 9. $\frac{y - 4}{3y^2}$ 10. $\frac{5(k + 3)}{3k}$ 11. $\frac{m - 2}{m + 3}$ 12. $\frac{r + 2}{r + 4}$
 13. $\frac{x + 3}{x + 1}$ 14. $\frac{z + 2}{z - 2}$ 15. $\frac{3}{16a}$ 16. $\frac{5}{18}$ 17. $\frac{3y}{x^2}$ 18. $\frac{y}{7}$
 19. $\frac{5}{4c}$ 20. $\frac{3w}{2}$ 21. $\frac{3}{4}$ 22. $\frac{1}{3}$ 23. $\frac{3}{10}$ 24. $\frac{4}{9}$

A1-2 Answers for Chapter 1

25. $\frac{2(a+4)}{a-3}$ 26. $\frac{2}{r+2}$ 27. $\frac{k+2}{k+3}$ 28. $\frac{n+4}{n-4}$
 29. Answers vary. 30. Answers vary. 31. $\frac{3}{35z}$ 32. $\frac{1}{12z}$
 33. $\frac{4}{3}$ 34. $-\frac{1}{4}$ 35. $\frac{20+x}{5x}$ 36. $\frac{3(8-r)}{4r}$ 37. $\frac{3m-2}{m(m-1)}$
 38. $\frac{5y-6}{y(y+2)}$ 39. $\frac{37}{5(b+2)}$ 40. $\frac{13}{3(k+1)}$ 41. $\frac{33}{20(k-2)}$
 42. $\frac{17}{6(p+4)}$ 43. $\frac{7x-1}{(x-3)(x-1)(x+2)}$
 44. $\frac{10m+26}{(m-5)(m+2)(m+4)}$ 45. $\frac{y^2}{(y+4)(y+3)(y+2)}$
 46. $\frac{-4r^2+20r}{(r-8)(r-2)(r+4)}$ 47. $\frac{x+1}{x-1}$ 48. $\frac{y-1}{y+1}$
 49. $\frac{-1}{x(x+h)}$ 50. $\frac{-2x-h}{(x+h)^2x^2}$ 51. (a) $\frac{\pi x^2}{4x^2}$ (b) $\frac{\pi}{4}$
 52. (a) $\frac{\pi x^2}{36\pi x^2}$ (b) $\frac{1}{36}$ 53. (a) $\frac{x^2}{25x^2}$ (b) $\frac{1}{25}$
 54. (a) $\frac{x^2}{18x^2}$ (b) $\frac{1}{18}$ 55. $\frac{-7.2x^2 + 6995x + 230,000}{1000x}$
 56. \$18.35; \$11.24; \$7.94 57. About \$3.8 million
 58. About \$4.9 million 59. No 60. No 61. \$2.55
 62. \$2.94 63. \$6531 64. No

Section 1.5 (Page 41)

1. 49 2. $(-6)^8 = 1,679,616$ 3. $16c^2$ 4. $16x^4$
 5. $\frac{32}{x^5}$ 6. $\frac{125}{x^3y^3}$ 7. $108u^{12}$ 8. $\frac{125v^2}{16}$ 9. $\frac{1}{7}$ 10. $\frac{1}{1000}$
 11. $-\frac{1}{7776}$ 12. $\frac{1}{x^4}$ 13. $-\frac{1}{y^3}$ 14. 36 15. $\frac{9}{16}$ 16. $\frac{y^4}{x^2}$
 17. $\frac{b^3}{a}$ 18. Answers vary 19. 7 20. 2 21. About 1.55
 22. $288\sqrt{3} \approx 498.83$ 23. -16 24. -512 25. $\frac{81}{16}$ 26. $\frac{4}{3}$ 27. $\frac{4^2}{5^3}$
 28. $\frac{1}{7}$ 29. 4^3 30. 9 31. 4^8 32. 5^3 33. z^3 34. k^3
 35. $\frac{p}{9}$ 36. $\frac{1}{25x^{10}}$ 37. $\frac{q^5}{r^3}$ 38. $\frac{z^6}{8y^6}$ 39. $\frac{8}{25p^7}$ 40. $\frac{1296}{x^{18}}$
 41. $2^{5/6}p^{3/2}$ 42. $5^{9/4}k^{13/4}$ 43. $2p + 5p^{5/3}$ 44. $6 + 3x^3$
 45. $\frac{1}{3y^{2/3}}$ 46. $c^{3/4}d^{3/4}$ 47. $\frac{a^{1/2}}{49b^{5/2}}$ 48. $\frac{2}{x^{1/2}y^{3/2}}$
 49. $x^{7/6} - x^{11/6}$ 50. $3x^2 + 2$ 51. $x - y$
 52. $2x^{2/3} + 2x^{1/3}y^{1/2} - x^{1/3}y^{3/2} - y^2$ 53. (f) 54. (b) 55. (h)
 56. (d) 57. (g) 58. (a) 59. (c) 60. (e) 61. 5 62. 2
 63. 5 64. -2 65. 21 66. 9 67. $\sqrt{77}$ 68. $\sqrt{33}$
 69. $5\sqrt{3}$ 70. $16\sqrt{3}$ 71. $-\sqrt{2}$ 72. $13\sqrt{3}$ 73. $15\sqrt{5}$
 74. -1 75. 3 76. Answers vary. 77. $-3 - 3\sqrt{2}$
 78. $\frac{\sqrt{5}-1}{2}$ 79. $4 + \sqrt{3}$ 80. $-1 - \sqrt{3}$ 81. $\frac{7}{11 + 6\sqrt{2}}$
 82. $\frac{-6}{2 - 2\sqrt{7} - \sqrt{3} + \sqrt{21}}$ 83. (a) 14 (b) 85 (c) 58.0
 84. 73.8 in 85. About \$11.1 billion 86. About \$11.5 billion
 87. About \$11.7 billion 88. About \$12.0 billion 89. About \$4.2 billion 90. About \$5.0 billion 91. About \$5.8 billion
 92. About \$6.1 billion 93. About 6.1 million 94. About 6.3 million 95. About 6.5 million 96. About 6.7 million

Section 1.6 (Page 50)

1. 4 2. -3 3. 7 4. $\frac{6}{5.1} \approx 1.18$ 5. $-\frac{10}{9}$ 6. $\frac{13}{2}$
 7. 4 8. -6 9. $\frac{40}{7}$ 10. -7 11. $\frac{26}{3}$ 12. -40 13. $-\frac{12}{5}$
 14. $-\frac{48}{71}$ 15. $-\frac{59}{6}$ 16. $-\frac{11}{5}$ 17. $-\frac{9}{4}$ 18. $\frac{29}{12}$ 19. $x = .72$

20. 1.6 21. $r \approx -13.26$ 22. About 1.02 23. $\frac{b-5a}{2}$
 24. $\frac{5a-b}{a+b}$ 25. $x = \frac{3b}{a+5}$ 26. 2 27. $V = \frac{k}{p}$
 28. $p = \frac{i}{rt}$ 29. $g = \frac{V-V_0}{t}$ 30. $g = \frac{S-S_0-k}{t^2}$
 31. $B = \frac{2A}{h} - b$ or $B = \frac{2A-bh}{h}$ 32. $F = \frac{9}{5}C + 32$ 33. -2, 3
 34. $-\frac{9}{4}, \frac{15}{4}$ 35. -8, 2 36. $-\frac{8}{5}, \frac{22}{5}$ 37. $\frac{5}{2}, \frac{7}{2}$ 38. $\frac{1}{8}, \frac{7}{8}$
 39. 23° 40. 5° 41. 71.6° 42. 96.8° 43. 13.12 44. 18.87
 45. 2018 46. 2020 47. 2021 48. 2025 49. 2011
 50. 2014 51. 2018 52. 2022 53. 2013 54. 2016
 55. 2020 56. 2025 57. \$205.41 58. \$92.86 59. \$21,000
 60. \$8,000 61. \$70,000 for the first plot; \$50,000 for the second
 62. \$5000 63. About 8.6 million 64. About 14.3 million
 65. 301 million 66. 300.3 million 67. $\frac{400}{3}L$
 68. 4L of 92-octane gasoline and 8L of 98-octane gasoline

Section 1.7 (Page 58)

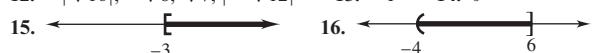
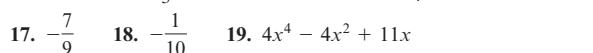
1. -4, 14 2. 16, 5 3. 0, -6 4. 0, 2 5. 0, 2 6. -8, 8
 7. -7, -8 8. -1, 5 9. $\frac{1}{2}, 3$ 10. $\frac{1}{3}, -\frac{2}{5}$ 11. $-\frac{1}{2}, \frac{1}{3}$
 12. $\frac{1}{3}, 5$ 13. $\frac{5}{2}, 4$ 14. $-\frac{4}{3}, -\frac{3}{2}$ 15. -5, -2
 16. $\frac{1}{2}, -4$ 17. $\frac{4}{3}, -\frac{4}{3}$ 18. $\frac{7}{6}, -\frac{7}{6}$ 19. 0, 1 20. 0, 4
 21. $2 \pm \sqrt{7}$ 22. $-4 \pm 3\sqrt{3}$ 23. $\frac{1 \pm 2\sqrt{5}}{4}$
 24. $\frac{-5 \pm \sqrt{11}}{3}$ 25. $\frac{-7 \pm \sqrt{41}}{4}; -1492, -3.3508$
 26. $\frac{-1 \pm \sqrt{85}}{6}; 1.7033, -1.3699$ 27. $\frac{-1 \pm \sqrt{5}}{4}; .3090, -.8090$
 28. $\frac{3 \pm \sqrt{29}}{2}; 4.1926, -1.1926$ 29. $\frac{-5 \pm \sqrt{65}}{10}; .3062, -1.3062$
 30. $\frac{4 \pm \sqrt{10}}{2}; 3.5811, .4189$ 31. No real-number solutions
 32. No real-number solutions 33. $-\frac{5}{2}, 1$
 34. No real-number solutions 35. No real-number solutions
 36. $\frac{-1 \pm \sqrt{73}}{6}; -1.5907, 1.2573$ 37. $-\frac{5}{2}, \frac{3}{2}$ 38. $-\frac{1}{5}, 1$
 39. 1 40. 2 41. 2 42. 0 43. $x \approx .4701$ or 1.8240
 44. $x = 13.79$ 45. $x \approx -1.0376$ or $.6720$ 46. $x \approx .7790$ or $-.39890$
 47. \$43.6 thousand 48. \$57.65 thousand
 49. 2006 ($x \approx 5.46$) 50. 2013 ($x \approx 12.45$)
 51. 2015 ($x \approx 14.42$) 52. 2016 ($x \approx 15.47$) 53. \$43.19
 54. \$38.67 55. First quarter of 2017 ($x \approx 8.14$) 56. Second quarter of 2017 ($x \approx 9.75$) 57. About 1.046 ft. 58. 3 ft.
 59. (a) $x + 20$ (b) Northbound: $5x$; eastbound: $5(x + 20)$ or $5x + 100$
 (c) $(5x)^2 + (5x + 100)^2 = 300^2$ (d) About 31.23 mph and 51.23 mph
 60. About 61 min 61. (a) $150 - x$ (b) $x(150 - x) = 5000$
 (c) Length 100 m; width 50 m 62. 1 ft. 63. 9 ft. by 12 ft.
 64. Harroun 74.3 mph; Rossi 166.3 mph 65. 6.25 sec.
 66. 3.5 sec. 67. (a) About 3.54 sec. (b) 2.5 sec. (c) 144 ft.
 68. (a) About 4.38 sec. (b) 50 sec. 69. (a) 2 sec. (b) $\frac{3}{4}$ sec. or $\frac{13}{4}$ sec.
 (c) It reaches the given height twice: once on the way up and once on the way down. 70. (a) About .55 seconds. (b) About .37 seconds.

71. $t = \frac{\sqrt{2Sg}}{g}$ 72. $r = \sqrt{\frac{a}{\pi}}$ 73. $h = \frac{d^2\sqrt{gL}}{L}$
 74. $v = \sqrt{\frac{Fr}{KM}}$ 75. $R = \frac{-2Pr + E^2 \pm E\sqrt{E^2 - 4Pr}}{2P}$

76. $r = \frac{-\pi h \pm \sqrt{\pi^2 h^2 + 2\pi S}}{2\pi}$

Chapter 1 Review Exercises (Page 61)

Refer to Section	1.1	1.2	1.3	1.4	1.5	1.6	1.7
For Exercises	1–18, 81–84	19–24, 85–92	25–32 93–96	33–38, 97–98	39–60, 99–100	61–68, 101–106	69–80,

1. 0, 6 2. $-12, -6, -\sqrt{4}, 0, 6$ 3. $-12, -6, -\frac{9}{10}, -\sqrt{4}, 0, \frac{1}{8}, 6$
 4. $-\sqrt{7}, \frac{\pi}{4}, \sqrt{11}$ 5. Commutative property of multiplication
 6. Commutative property of multiplication 7. Distributive property
 8. Associative property of addition 9. $x \geq 9$ 10. $x < 0$
 11. $-|3 - (-2)|, -|-2|, |6 - 4|, |8 + 1|$
 12. $-|\sqrt{16}|, -\sqrt{8}, \sqrt{7}, |- \sqrt{12}|$ 13. -1 14. 0
 15.  16. 
 17. $-\frac{7}{9}$ 18. $-\frac{1}{10}$ 19. $4x^4 - 4x^2 + 11x$
 20. $-10y^3 + 4y^2 - 5y + 10$ 21. $25k^2 - 4h^2$ 22. $4r^2 - 25y^2$
 23. $9x^2 + 24xy + 16y^2$ 24. $4a^2 - 20ab + 25b^2$
 25. $k(2h^2 - 4h + 5)$ 26. $2n^2(m^2 + 3m + 8)$
 27. $a^2(5a + 2)(a + 1)$ 28. $4x(3x - 1)(2x + 1)$
 29. $(12p + 13q)(12p - 13q)$ 30. $(9z + 5x)(9z - 5x)$
 31. $(3y - 1)(9y^2 + 3y + 1)$ 32. $(5a + 6)(25a^2 - 30a + 36)$
 33. $\frac{9x^2}{4}$ 34. $\frac{5k(3k - 28)}{72}$ 35. 4 36. $\frac{3p^2}{(p + 4)(p + 2)}$
 37. $\frac{(m - 1)^2}{3(m + 1)}$ 38. $\frac{x(x + 1)^2}{2(x^2 + 1)(x - 5)}$ 39. $\frac{1}{5^3}$ or $\frac{1}{125}$ 40. $\frac{1}{100}$
 41. -1 42. $\frac{36}{25}$ 43. 4^3 44. $\frac{1}{7^7}$ 45. $\frac{1}{8}$ 46. $\frac{1}{6^7}$ 47. $\frac{7}{10}$

48. $\frac{6}{25}$ 49. $\frac{1}{5^{\frac{3}{2}}}$ 50. 1 51. $3^{\frac{7}{2}}a^{\frac{5}{2}}$ 52. $2^{\frac{17}{6}}P^{\frac{31}{6}}$
 53. 3 54. Not a real number 55. $3pq\sqrt[3]{2q^2}$ 56. $2a\sqrt[4]{4ab^3}$
 57. $-21\sqrt{3}$ 58. $14\sqrt{7}$ 59. $\sqrt{6} - \sqrt{3}$
 60. $\frac{16 + 4\sqrt{2} + 4\sqrt{5} + \sqrt{10}}{11}$ 61. $-\frac{1}{3}$ 62. $\frac{7}{2}$ 63. No solution
 64. No solution 65. $x = \frac{3}{8a - 2}$ 66. $x = \frac{4b^2}{b^2 - 2}$ 67. $-38, 42$
 68. $2, \frac{1}{5}$ 69. $-7 \pm \sqrt{5}$ 70. $\frac{-1 \pm \sqrt{7}}{2}$ 71. $\frac{1}{2}, -2$
 72. $3, -\frac{5}{2}$ 73. $-\frac{3}{2}, 7$ 74. $-\frac{8}{3}, 2$ 75. $\pm \frac{\sqrt{3}}{3}$ 76. $\pm \frac{\sqrt{3}}{3}$
 77. $r = \frac{-Rp \pm E\sqrt{Rp}}{p}$ 78. $E = \frac{\pm(r + R)\sqrt{pR}}{R}$
 79. $s = \frac{a \pm \sqrt{a^2 + 4K}}{2}$ 80. $z = \frac{h \pm \sqrt{h^2 + 4kt}}{2k}$ 81. 82%
 82. 19.5% 83. \$1536.25 84. \$23.43 85. 2013 86. 2016
 87. 2014 88. 2017 89. 17.05 million 90. 17.68 million
 91. March ($x \approx 2.33$) 92. October ($x \approx 9.41$)
 93. About 9.16 million 94. About 8.81 million
 95. 2013 ($x \approx 12.67$) 96. 2017 ($x \approx 16.70$)
 97. About \$30.91 billion 98. About \$33.84 billion 99. 11%
 100. 10 pounds of beef and 20 pounds of pork 101. About 69.9%
 102. 2006 103. 3.2 feet 104. Length is 129 ft; width is 31 ft.
 105. About 7.77 seconds 106. About 5.12 seconds

Case Study 1 Exercises (Page 64)

1. $218 + 508x$ 2. $328 + 309x$ 3. Electric by \$1880
 4. In the first year 5. $1529.10 + 50x$ 6. $1618.20 + 44x$
 7. LG by \$29.10 8. In the 14th year