11. $\frac{3x-4}{48-3x^2}$; undefined for $x = -4, 4$ 13. $\frac{4}{y-3}$ 15. $\frac{-x-1}{y-x}$ 17. $\frac{x-2}{y-x}$

19. $\frac{a-1}{3a+b}$ 21. $\frac{-2}{cd^2}$ 23. $\frac{2r}{t}$ 25. $\frac{x-2}{3x^2}$ 27. $\frac{-5}{u^4}$ 29. $\frac{2x+3}{3}$

31. $-3a^2 + 2a - 1$ 33. $\frac{2y^2 - 3x^2y}{3}$ 35. $\frac{6(1+t)}{(1-t)}$ 37. $y - 2$ 39. $\frac{-2}{y^2+3y+9}$

41. $\frac{2(x^2+9)}{3(x+3)}$ 43. $\frac{-3x-y}{3x-y}$ 45. $\frac{2x-3}{x-1}$ 47. $\frac{-2x-3}{2x-3}$ 49. $\frac{4y^2+6y+9}{2y+3}$

51. $\frac{3xy-1}{2xy-1}$ 53. $\frac{2a-b}{a-2b}$ 55. $\frac{6(x^2-6)(x^2+1)}{(2x^2+3)(x^2+4)}$ 57. $\frac{q(2pq+1)}{p(3pq+1)}$ 59. $\frac{x+y}{2}$

61. $\frac{x+y}{a+2b}$ 63. $\frac{x+3}{2x+1}$ 65. $\frac{8(3x-4)}{x^3}$ 67. $\frac{x^2-1}{4}$ 69. (b) 71. None

73. a. $\frac{25}{r+8}$ b. $\frac{25}{r-8}$ c. $\frac{50r}{r^2-64}$

75. a. $\frac{900}{400+w}$ b. $\frac{900}{400-w}$ c. Orville, $\frac{1800w}{160{,}000-w^2}$

77. a. $\frac{600}{w}$ yards b. $2w + \frac{1200}{w}$; no c. $20w + \frac{12{,}000}{w}$ dollars

79. a. $\frac{900}{w(w+2)}$ b. $w^2 + 2w + \frac{3600(w+1)}{w^2+2w}$

Exercise 2.2 [page 68] 1. $\frac{10}{3}$ 3. $\frac{25p}{n}$ 5. $\frac{-np^2}{2}$ 7. $\frac{2x^5}{7}$ 9. $\frac{x^3y^3}{2}$ 11. $\frac{-x^3y^2z^2}{3}$

13. $\frac{-b^2}{a}$ 15. $\frac{3c}{35ab}$ 17. $\frac{5}{ab}$ 19. 5 21. $\frac{a(2a-1)}{a+4}$ 23. $\frac{(3x+1)(x-2)}{(3x-1)(x-1)}$

25. $\frac{-2(a-3)}{7(a-1)}$ 27. $\frac{6x(x-2)(x-1)^2}{(x^2-8)(x^2-2x+4)}$ 29. $\frac{8v(u-2v)(u+2)}{(u+2v)(u-3v)}$ 31. $\frac{1}{5}x^2 - 3x$

33. $x^2 + \frac{2}{3}x + \frac{1}{9}$ 35. $y^2 - \frac{1}{2}y + \frac{1}{16}$ 37. $\frac{2}{9}$ 39. $\frac{a+1}{a-2}$ 41. $\frac{3x-1}{x-2}$

43. $3(x^2 - xy + y^2)$ 45. $\frac{(y-3)(x+2)}{(x+1)(x-3)}$ 47. $\frac{x+2}{x^2-1}$ 49. $\frac{x^2(x-4)}{(x+1)}$ 51. $\frac{x+3}{6y}$

53. $6rs - 5 + \frac{2}{rs}$ 55. $-5s^8 + 7s^3 - \frac{2}{s^2}$ 57. $9a + 3 + \frac{4a}{b}$ 59. $2y + 5 + \frac{2}{2y+1}$

61. $x^2 + 4x + 9 + \frac{19}{x-2}$ 63. $4z^3 - 2z^2 + 3z + 1 + \frac{2}{2z+1}$

65. $x^3 + 2x^2 + 4x + 8 + \frac{15}{x-2}$ 67. $x - 1 + \frac{-7x+12}{x^2-2x+7}$

69. $4a^2 - 9a + 31 + \frac{-104a+32}{a^2+3a-1}$ 71. $t - 1 + \frac{-t^2-3t+3}{t^3-2t^2+t+2}$ 73. $k = -2$