

- 63. $\frac{|x|}{x^2 y^2}$
- 65. $\frac{3y^2}{|x^2|}$
- 67. $\frac{\sqrt[3]{3}}{\sqrt{8}} \sqrt{|x^2 y|}$
- 69. $\frac{2x\sqrt[4]{x}}{y}$
- 71. 0
- 73. $(x - 2|y|)\sqrt{x}$
- 75. <
- 77. =
- 79. >
- 81. <
- 83. ≈ 3.48 sec

85. If n is even, then there are two real n th roots of a (when $a > 0$): $\sqrt[n]{a}$ and $-\sqrt[n]{a}$.

Appendix A.2 (pp. 802-808)

- 1. $3x^2 + 2x - 1$; degree 2
- 3. $-x^7 + 1$; degree 7
- 5. no
- 7. yes
- 9. $4x^2 + 2x + 4$
- 11. $3x^3 - x^2 - 9x + 3$
- 13. $2x^3 - 2x^2 + 6x$
- 15. $-12u^2 + 3u$
- 17. $-15x^3 - 5x^2 + 10x$
- 19. $x^2 + 3x - 10$
- 21. $3x^2 + x - 10$
- 23. $9x^2 - y^2$
- 25. $9x^2 + 24xy + 16y^2$
- 27. $8u^3 - 12u^2v + 6uv^2 - v^3$
- 29. $4x^6 - 9y^2$
- 31. $x^3 + 2x^2 - 5x + 12$
- 33. $x^4 + 2x^3 - x^2 - 2x - 3$
- 35. $x^2 - 2$
- 37. $u - v$, $u \geq 0$ and $v \geq 0$
- 39. $x^3 - 8$
- 41. $5(x - 3)$
- 43. $yz(z^2 - 3z + 2)$
- 45. $(z + 7)(z - 7)$
- 47. $(8 + 5y)(8 - 5y)$
- 49. $(y + 4)^2$
- 51. $(2z - 1)^2$
- 53. $(y - 2)(y^2 + 2y + 4)$
- 55. $(3y - 2)(9y^2 + 6y + 4)$
- 57. $(1 - x)(x^2 + x + 1)$
- 59. $(x + 2)(x + 7)$
- 61. $(z - 8)(z + 3)$

- 63. $(2u - 5)(7u + 1)$
- 65. $(3x + 5)(4x - 3)$
- 67. $(2x + 5y)(3x - 2y)$
- 69. $(x - 4)(x^2 + 5)$
- 71. $(x^2 - 3)(x^2 + 1)$
- 73. $(c + 3d)(2a - b)$
- 75. $x(x^2 + 1)$
- 77. $2x(3y + 4)^2$
- 79. $y(4 + y)(4 - y)$
- 81. $y(y + 1)(5 - 2y)$
- 83. $2(5x + 4)(5x - 2)$
- 85. $2(2x + 5)(3x - 2)$
- 87. $(2a - b)(c + 2d)$
- 89. $(x - 3)(x + 2)(x - 2)$
- 91. $(2ac + bc) - (2ad + bd) = c(2a + b) - d(2a + b) = (2a + b)(c - d)$

Appendix A.3 (pp. 808-813)

- 1. $\frac{5}{3}$
- 3. $\frac{30}{77}$
- 5. $\frac{5}{6}$
- 7. $\frac{1}{10}$
- 9. all real numbers
- 11. $[4, \infty)$
- 13. $x \neq 0$ and $x \neq -3$
- 15. $x \neq 2$ and $x \neq 1$
- 17. $x \neq 0$
- 19. $8x^2$
- 21. x^2
- 23. $x^2 + 7x + 12$
- 25. $x^3 + 2x^2$
- 27. $(x - 2)(x + 7)$ cancels out during simplification; the restriction indicates that the values 2 and 7 were not valid in the original expression.
- 29. No factors were removed from the expression; can see by inspection that $\frac{2}{3}$ and 5 are not valid.
- 31. $(x - 3)$ ends up in the numerator of the simplified expression; the restriction reminds us that it is not allowed in the denominator, so that 3 is not allowed.
- 33. $\frac{6x^2}{5}$, $x \neq 0$
- 35. $\frac{x^2}{x - 2}$, $x \neq 0, 2$
- 37. $-\frac{z}{z + 3}$, $z \neq -3, -3$
- 38. $\frac{x + 3}{x - 4}$, $x \neq -3, 4$