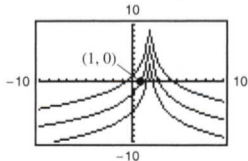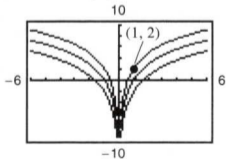## Section 5.2   (page 340)
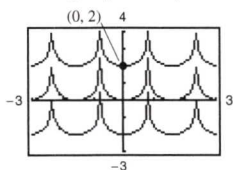
1. $5 \ln|x| + C$ **3.** $\ln|x + 1| + C$ **5.** $\frac{1}{2} \ln|2x + 5| + C$

7. $\frac{1}{2} \ln|x^2 - 3| + C$ **9.** $\ln|x^4 + 3x| + C$

11. $x^2/2 - \ln(x^4) + C$ **13.** $\frac{1}{3} \ln|x^3 + 3x^2 + 9x| + C$

15. $\frac{1}{2}x^2 - 4x + 6 \ln|x + 1| + C$ **17.** $\frac{1}{3}x^3 + 5 \ln|x - 3| + C$

19. $\frac{1}{3}x^3 - 2x + \ln\sqrt{x^2 + 2} + C$ **21.** $\frac{1}{3}(\ln x)^3 + C$

23. $2\sqrt{x + 1} + C$ **25.** $2 \ln|x - 1| - 2/(x - 1) + C$

27. $\sqrt{2x} - \ln\left|1 + \sqrt{2x}\right| + C$

29. $x + 6\sqrt{x} + 18 \ln\left|\sqrt{x} - 3\right| + C$ **31.** $3 \ln\left|\sin\dfrac{\theta}{3}\right| + C$

33. $-\frac{1}{2} \ln|\csc 2x + \cot 2x| + C$ **35.** $\frac{1}{3} \sin 3\theta - \theta + C$

37. $\ln|1 + \sin t| + C$ **39.** $\ln|\sec x - 1| + C$

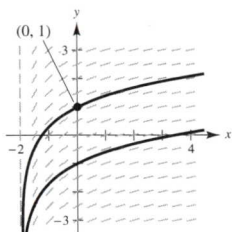**41.** $y = 4 \ln|x| + C$ **43.** $y = -3 \ln|2 - x| + C$

The graph has a hole at $x = 2$.
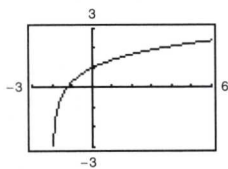
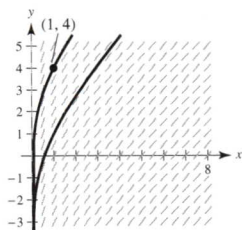**45.** $s = -\frac{1}{2} \ln|\cos 2\theta| + C$ **47.** $f(x) = -2 \ln x + 3x - 2$

49. (a)
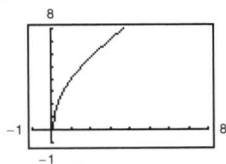

(b) $y = \ln\left(\dfrac{x + 2}{2}\right) + 1$

51. (a)

(b) $y = \ln x + x + 3$

53. $\frac{5}{3} \ln 13 \approx 4.275$ **55.** $\frac{7}{3}$ **57.** $-\ln 3 \approx -1.099$

59. $\ln\left|\dfrac{2 - \sin 2}{1 - \sin 1}\right| \approx 1.929$ **61.** $2[\sqrt{x} - \ln(1 + \sqrt{x})] + C$

63. $\ln\left(\dfrac{\sqrt{x} - 1}{\sqrt{x} + 1}\right) + 2\sqrt{x} + C$ **65.** $\ln(\sqrt{2} + 1) - \dfrac{\sqrt{2}}{2} \approx 0.174$

67. $1/x$ **69.** $1/x$ **71.** d   **73.** $6 \ln 3$ **75.** $\frac{1}{2} \ln 2$

77. $\frac{15}{2} + 8 \ln 2 \approx 13.045$

79. $(12/\pi)\ln(2 + \sqrt{3}) \approx 5.03$

81. Trapezoidal Rule: 20.2   **83.** Trapezoidal Rule: 5.3368
     Simpson's Rule: 19.4667   Simpson's Rule: 5.3632

85. Power Rule   **87.** Log Rule   **89.** $x = 2$ **91.** Proof

93. $-\ln|\cos x| + C = \ln|1/\cos x| + C = \ln|\sec x| + C$

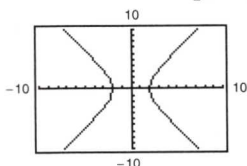**95.** $\ln|\sec x + \tan x| + C = \ln\left|\dfrac{\sec^2 x - \tan^2 x}{\sec x - \tan x}\right| + C$
                               $= -\ln|\sec x - \tan x| + C$

97. 1   **99.** $1/(e - 1) \approx 0.582$

101. $P(t) = 1000(12 \ln|1 + 0.25t| + 1); P(3) \approx 7715$

103. \$168.27   **105.** False. $\frac{1}{2}(\ln x) = \ln x^{1/2}$ **107.** True

109. (a)
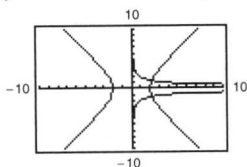

(b) Answers will vary.
     Example:
     $y^2 = e^{-\ln x + \ln 4} = 4/x$

(c) Answers will vary.

111. Proof