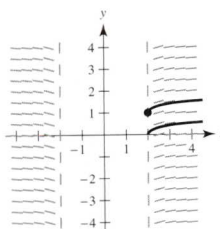
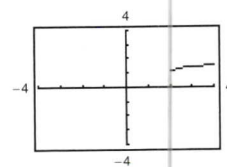


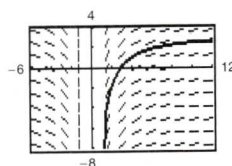
65. (a)



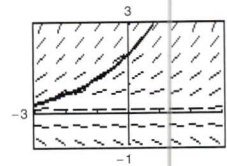
(b) $y = \frac{1}{2} \operatorname{arccsc}(x/2) + 1$,
 $x \geq 2$



67.



69.



71. $\pi/3$ 73. $\pi/8$ 75. $3\pi/2$

77. (a) Proof (b) $\ln(\sqrt{6}/2) + (9\pi - 4\pi\sqrt{3})/36$

79. (a)  (b) 0.5708
 (c) $(\pi - 2)/2$

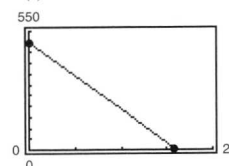
81. (a) $F(x)$ represents the average value of $f(x)$ over the interval $[x, x + 2]$. Maximum at $x = -1$.

(b) Maximum at $x = -1$.

83. False. $\int \frac{dx}{3x\sqrt{9x^2 - 16}} = \frac{1}{12} \operatorname{arccsc} \frac{|3x|}{4} + C$

85. True 87–89. Proofs

91. (a) $v(t) = -32t + 500$



(b) $s(t) = -16t^2 + 500t$; 3906.25 ft

(c) $v(t) = \sqrt{\frac{32}{k}} \tan \left[\arctan \left(500 \sqrt{\frac{k}{32}} \right) - \sqrt{32k} t \right]$

(d)  (e) 1088 ft

(f) When air resistance is taken into account, the maximum height of the object is not as great.

$t_0 = 6.86$ sec

Section 5.7 (page 387)

1. $\arcsin \frac{x}{3} + C$ 3. $\frac{7}{4} \arctan \frac{x}{4} + C$ 5. $\operatorname{arcsec}|2x| + C$

7. $\arcsin(x + 1) + C$ 9. $\frac{1}{2} \arcsin t^2 + C$

11. $\frac{1}{10} \arctan \frac{t^2}{5} + C$ 13. $\frac{1}{4} \arctan(e^{2x}/2) + C$

15. $\arcsin\left(\frac{\tan x}{5}\right) + C$ 17. $\frac{1}{2}x^2 - \frac{1}{2} \ln(x^2 + 1) + C$

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

23. $8 \arcsin[(x - 3)/3] - \sqrt{6x - x^2} + C$ 25. $\pi/6$

27. $\pi/6$ 29. $\frac{1}{2}(\sqrt{3} - 2) \approx -0.134$

31. $\frac{1}{5} \arctan \frac{3}{5} \approx 0.108$ 33. $\arctan 5 - \frac{\pi}{4} \approx 0.588$

35. $\pi/4$ 37. $\frac{1}{32} \pi^2 \approx 0.308$ 39. $\pi/2$

41. $\ln|x^2 + 6x + 13| - 3 \arctan[(x + 3)/2] + C$

43. $\arcsin[(x + 2)/2] + C$ 45. $-\sqrt{-x^2 - 4x} + C$

47. $4 - 2\sqrt{3} + \frac{1}{6}\pi \approx 1.059$ 49. $\frac{1}{2} \arctan(x^2 + 1) + C$

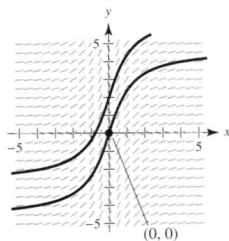
51. $2\sqrt{e^t - 3} - 2\sqrt{3} \arctan(\sqrt{e^t - 3}/\sqrt{3}) + C$ 53. $\pi/6$

55. a and b 57. a, b, and c

59. No. This integral does not correspond to any of the basic integration rules.

61. $y = \arcsin(x/2) + \pi$

63. (a)



(b) $y = 3 \arctan x$

