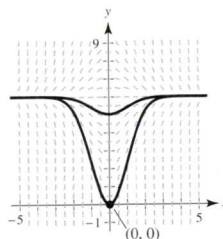


7. $y = Ce^{(2x^{3/2})/3}$ 9. $y = C(1 + x^2)$

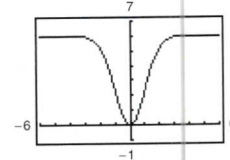
11. $dQ/dt = k/t^2$
 $Q = -k/t + C$

13. $dN/ds = k(500 - s)$
 $N = -(k/2)(500 - s)^2 + C$

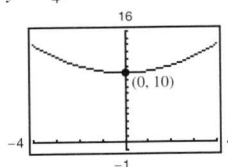
15. (a)



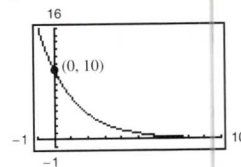
(b) $y = 6 - 6e^{-x^2/2}$



17. $y = \frac{1}{4}t^2 + 10$



19. $y = 10e^{-t/2}$



21. $dy/dx = ky$
 $y = 6e^{(1/4)\ln(5/2)x} \approx 6e^{0.2291x}$
 $y(8) \approx 37.5$

23. $dV/dt = kV$
 $V = 20,000e^{(1/4)\ln(5/8)t} \approx 20,000e^{-0.1175t}$
 $V(6) \approx 9882$

25. $y = (1/2)e^{[(\ln 10)/5]t} \approx (1/2)e^{0.4605t}$

27. $y = 5(5/2)^{1/4}e^{[\ln(2/5)/4]t} \approx 6.2872e^{-0.2291t}$

29. C is the initial value of y , and k is the proportionality constant.

31. Quadrants I and III; dy/dx is positive when both x and y are positive (Quadrant I) or when both x and y are negative (Quadrant III).

33. Amount after 1000 yr: 12.96 g;
 Amount after 10,000 yr: 0.26 g

35. Initial quantity: 7.63 g;
 Amount after 1000 yr: 4.95 g

37. Amount after 1000 yr: 4.43 g;
 Amount after 10,000 yr: 1.49 g

39. Initial quantity: 2.16 g;
 Amount after 10,000 yr: 1.62 g

41. 95.76%

43. Time to double: 11.55 yr; Amount after 10 yr: \$7288.48

45. Annual rate: 8.94%; Amount after 10 yr: \$1833.67

47. Annual rate: 9.50%; Time to double: 7.30 yr

49. \$224,174.18 51. \$61,377.75

53. (a) 10.24 yr (b) 9.93 yr (c) 9.90 yr (d) 9.90 yr

55. (a) 8.50 yr (b) 8.18 yr (c) 8.16 yr (d) 8.15 yr

57. (a) $P = 2.40e^{-0.006t}$ (b) 2.19 million
 (c) Because $k < 0$, the population is decreasing.

59. (a) $P = 5.66e^{0.024t}$ (b) 8.11 million
 (c) Because $k > 0$, the population is increasing.

61. (a) $P = 23.55e^{0.036t}$ (b) 40.41 million
 (c) Because $k > 0$, the population is increasing.

63. (a) $N = 100.1596(1.2455)^t$ (b) 6.3 h

65. (a) $N \approx 30(1 - e^{-0.0502t})$ (b) 36 days

Section 6.2 (page 420)

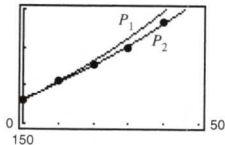
1. $y = \frac{1}{2}x^2 + 3x + C$ 3. $y = Ce^x - 3$ 5. $y^2 - 5x^2 = C$

67. (a) $P_1 \approx 181e^{0.01245t} \approx 181(1.01253)^t$

(b) $P_2 = 182.3248(1.01091)^t$

(c) 300

(d) 2011



P_2 is a better approximation.

69. (a) 20 dB (b) 70 dB (c) 95 dB (d) 120 dB

71. 2024 ($t = 16$) 73. 379.2°F

75. False. The rate of growth dy/dx is proportional to y .

77. True