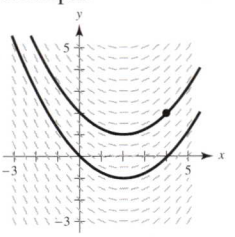
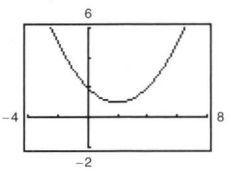
49. $y = x^2 - x + 1$

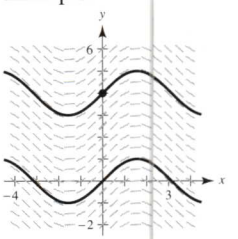
51. (a) Answers will vary. Example:



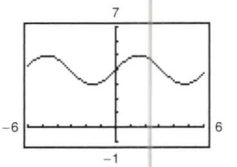
(b) $y = \frac{1}{4}x^2 - x + 2$



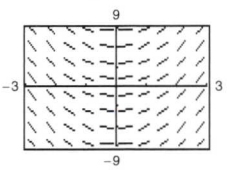
53. (a) Answers will vary. Example:



(b) $y = \sin x + 4$

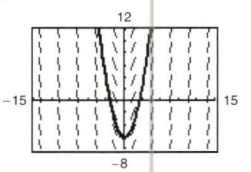


55. (a)



(b) $y = x^2 - 6$

(c)



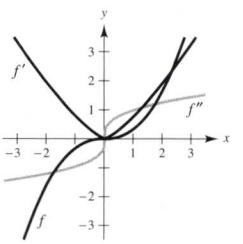
57. $f(x) = 3x^2 + 8$ **59.** $h(t) = 2t^4 + 5t - 11$

61. $f(x) = x^2 + x + 4$ **63.** $f(x) = -4\sqrt{x} + 3x$

65. (a) $h(t) = \frac{3}{4}t^2 + 5t + 12$ (b) 69 cm

67. When you evaluate the integral $\int f(x)\,dx$, you are finding a function $F(x)$ that is an antiderivative of $f(x)$. So, there is no difference.

69.



71. 62.25 ft **73.** $v_0 \approx 187.617$ ft/sec

75. $v(t) = -9.8t + C_1 = -9.8t + v_0$

$f(t) = -4.9t^2 + v_0t + C_2 = -4.9t^2 + v_0t + s_0$

77. 7.1 m **79.** 320 m; -32 m/sec

81. (a) $v(t) = 3t^2 - 12t + 9$; $a(t) = 6t - 12$

(b) (0, 1), (3, 5) (c) -3

83. $a(t) = -1/(2t^{3/2})$; $x(t) = 2\sqrt{t} + 2$

85. (a) 1.18 m/sec^2 (b) 190 m

87. (a) 300 ft (b) 60 ft/sec $\approx$ 41 mi/h

89. (a) Airplane A: $s_A = \frac{625}{2}t^2 - 150t + 10$

Airplane B: $s_B = \frac{49{,}275}{68}t^2 - 250t + 17$

Chapter 4

Section 4.1 (page 255)

1–3. Proofs **5.** $y = 3t^3 + C$ **7.** $y = \frac{2}{5}x^{5/2} + C$

	Original Integral	*Rewrite*	*Integrate*	*Simplify*
9.	$\int \sqrt[3]{x}\,dx$	$\int x^{1/3}\,dx$	$\frac{x^{4/3}}{4/3} + C$	$\frac{3}{4}x^{4/3} + C$
11.	$\int \frac{1}{x\sqrt{x}}\,dx$	$\int x^{-3/2}\,dx$	$\frac{x^{-1/2}}{-1/2} + C$	$-\frac{2}{\sqrt{x}} + C$
13.	$\int \frac{1}{2x^3}\,dx$	$\frac{1}{2}\int x^{-3}\,dx$	$\frac{1}{2}\left(\frac{x^{-2}}{-2}\right) + C$	$-\frac{1}{4x^2} + C$

15. $\frac{1}{2}x^2 + 7x + C$ **17.** $x^2 - x^3 + C$ **19.** $\frac{1}{6}x^6 + x + C$

21. $\frac{2}{5}x^{5/2} + x^2 + x + C$ **23.** $\frac{3}{5}x^{5/3} + C$ **25.** $-1/(4x^4) + C$

27. $\frac{2}{3}x^{3/2} + 12x^{1/2} + C = \frac{2}{3}x^{1/2}(x + 18) + C$

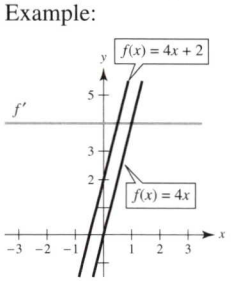
29. $x^3 + \frac{1}{2}x^2 - 2x + C$

31. $\frac{2}{7}y^{7/2} + C$ **33.** $x + C$ **35.** $5\sin x - 4\cos x + C$

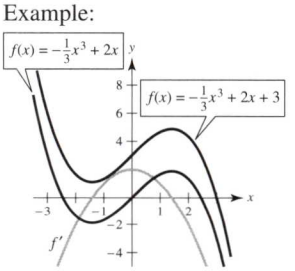
37. $t + \csc t + C$ **39.** $\tan\theta + \cos\theta + C$ **41.** $\tan y + C$

43. $-\csc x + C$

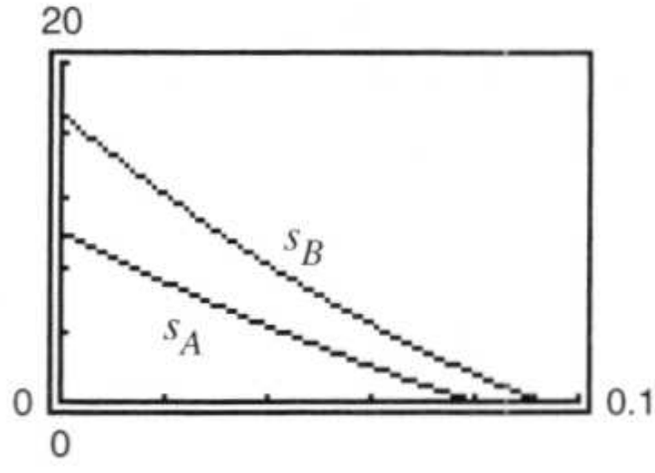
45. Answers will vary. Example:



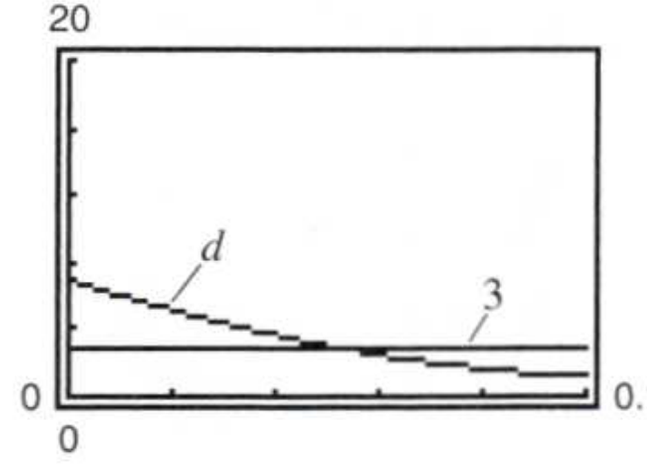
47. Answers will vary. Example:



(b)



(c) $d = \frac{28{,}025}{68}t^2 - 100t + 7$

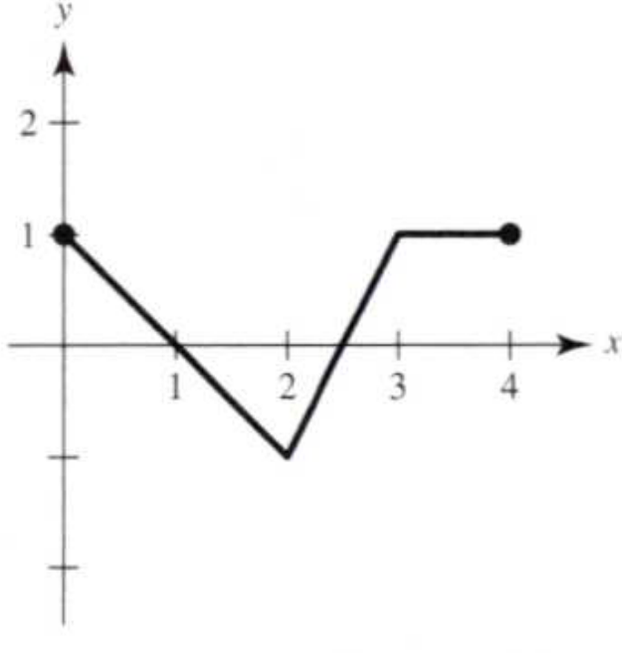


Yes, $d < 3$ for $t > 0.0505$ h

91. True **93.** True

95. False. f has an infinite number of antiderivatives, each differing by a constant.

97.



99. Proof