§1.1 page 16 12.) slope: $m = -3$, y-intercept: $(0, 2)$

30.) $\frac{1}{4}$

60.) ≈ 0.0205 seconds

§1.2 page 29 28.) $-2 \pm \sqrt{7}$

36.) a) 163.4032 pounds

b) 73.8173 in.

§1.3 page 38 46.) 4

56.) 84

§1.4 page 46 4.) $\frac{5\pi}{3}$

10.) 540^o

14.) yes

52.) 41.2122

64.) 6.16 cm/sec

§1.5 page 58 8.) $-\frac{1}{\sqrt{2}}$

26.) $\frac{3\pi}{2} + 2n\pi$

60. $p(t) = 6.7\cos(0.4964t) + 137$

§2.1 page 80 4.) not continuous

8.) a) ≈ 0.25 b) ≈ 0.25 c) yes d) does not exist e) undefined f) no

14.) a) F b) F c) F d) F e) T f) F g) F h) T i) T j) F

20.) 0.6, 0.8, does not exist

22.) does not exist

38.) 33

54.) $\sqrt{19}$

§2.2 page 91 6.) -7

8.) -8

16.) $\frac{\sqrt{3}}{2} + \frac{1}{\sqrt{3}}$

20.) does not exist

§2.3 page 98 4.) a) $-14x - 7h$; b) -70, -63, -56.7, -56.07

10.) a) 2; b) 2, 2, 2, 2

16.) a) 0, no; b) 0.9, 1.5, 1, 0.5, 0, -0.1, -0.4, -2, -1.4, 0; c) day 1, day 5, day 6, day 10; d) answers may vary

24.) m

§2.4 page 112

4.) c) $-14x$; d) 28, 0, -14

12.) c) $2x - 1$l; d) -5, -1, 1

20.) $y = 12x + 16$, $y = 0$, $y = 48x - 128$

32.) L_2, L_3, L_4, L_6

§2.5 page 123

8.) $-x^{-1/2}$

12.) $-3\sin x$

22.) $-\frac{2}{x^2} - \frac{1}{2}$

36.) $\frac{3}{2}\cos x + \frac{5}{8}\sin x$

42.) $y = 3.25x - 3$

§2.6 page 130

4.) a) $2t - \frac{1}{2}$; b) 2; c) 3.5, 2 d) 2.75

6.) a) $3 + \sin t$; b) $\cos t$; c) ≈ 3.866, 0.5; d) $\frac{3\pi}{2} + 2n\pi$

16.) a) $1.41W^{0.41}$

18.) a) $4000t$; b) 300,000; c) 40,000

§2.7 page 139

10.) $(7x^6 + 4x^3 - 50)\left(90x^9 - \frac{7}{2\sqrt{x}}\right) + (42x^5 + 12x^2)(9x^{10} - 7\sqrt{x})$

32.) $\frac{11t^2-38t-52}{(2t^2-3t-7)^2}$

92.) $y = -3x + 13$

22.) $\frac{1}{1+\cos x}$

36.) $\frac{-1}{\sin t+1}$

96.) a) $\frac{-100t^2+450}{(2t^2+9)^2}$; b) ≈ 12920; c) -163

§2.8 page 147

4.) $2\tan x \sec^2 x$

14.) $-3\sin(3t - 4)$

26.) $\frac{\cos\sqrt{t}}{2\sqrt{t}}$

32.) $\frac{8x(x^2+3)^3(x^3-1)^5-15x^2(x^2+3)^4(x^3-1)^4}{(x^3-1)^{10}}$

54.) $-x^{-3/2}$

72.) a) $D = 5c + 125$, $c = 2.199w$; b) 5; c) 2.199; d) 10.995; e) answers may vary

§2.9 page 153

6.) $\frac{108}{(3x+2)^5}$

12.) $8\sec^2(2x)\tan(2x)$

38.) $12t^2 + 2$

§3.1 page 176 8.) maximum at $\left(-1, \frac{13}{2}\right)$; minimum at $\left(\frac{2}{3}, \frac{113}{27}\right)$

16.) maximum at (0.3); minimums at $(-2, -13)$, $(2, -13)$

98.) maximums at $(1, 5)$, $(4, 5)$, minimums at $(3, 1)$, $(5, 2)$

§3.2 page 193 2.) minimum at $\left(-\frac{1}{2}, -\frac{5}{4}\right)$

4.) maximum at $(-2, 45)$, minimum at $(2, -51)$, inflection point at $(0, -3)$

8.) maximum at $(0, 5)$, minimums at $(-2, -27)$ and $(1, 0)$, inflection points at $(-1.22, -13.48)$ and $(0.55, 2.31)$

10.) minimum at $(1, 0)$

18.) maximum at $(0, 3)$, inflection points at $\left(\pm\frac{1}{\sqrt{3}}, \frac{9}{4}\right)$

44.) $(2, 2)$

108.) a) $(6.5, 7977394.5)$; b) $(3.04, 857206.15)$

§3.3 page 210 2.) 0

§3.4 page 225 8.) maximum at $(1, 4)$, minimum at $(4, -23)$

16.) maximum at $(\pm 3, 12)$, minimum at $(\pm 2, -13)$

22.) maximum at $(1, 2)$, minimum at $(-1, -2)$

50.) no absolute maximum or minimum

§3.5 page 235 2.) 35 and 35

18.) 480 sq. yd.

20.) 8.5×8.5 ft; 72.25 sq. ft.

24.) $4 \times 4 \times 2$ in; 48 sq. in.

26.) 0.6495 square units

30.) \$6.50

36.) 26.2093 months

38.) 6×8 yd.

§3.6 page 246 6.) $L(x) = \frac{1}{20}x + 5$

14.) 10.17

§3.7 page 253 2.) $\frac{2-y}{x-2y}$; $\frac{4}{5}$

12.) $\frac{x+y}{3y-x}$

20.) $-\frac{y^3}{x^3}$

32.) 0; $-\frac{3}{\sqrt{24}}$; $-\frac{9}{4}$

38.) -0.0408 m^2/month

40.) 2.083 ft/sec

§4.1 page 275 8.) 1050; 1103; 1276

22.) $x^4e^x(x+5)$

26.) $cosxsinx)e^x$

16.) e^{-x}

34.) $\frac{e^{\sqrt{x-4}}}{2\sqrt{x-4}}$

74.) $y = -6x + 2$

96.) a) $D'(t) = \frac{64.608e^{-0.072t}}{(1+29.44e^{-0.072t})^2}$; b) 0.00192 deaths per 1000 population

§4.2 page 292 12.) $\log_{10} 1000 = 3$

40.) ≈ 4.6

46.) $x^4(1 + 5\ln x) - x^3$

56.) $\frac{x^2-5}{x(x^2+5)}$

64.) $\frac{3(\ln x)^2}{x}$

74.) $\frac{x}{5+x^2}$

98.) a) 78%; b) 54%; c) 30%; d) 38.5%; e) $-\frac{15}{t+1}$; f) maximum of 78% when $t = 0$, no minimum; g) $-\infty$

§4.3 page 309 8.) a) 0.3466; b) 1414; c) 2049299; d) 3.1697

14.) a) $P(t) = P_0e^{0.08t}$; b) $\approx$ \$ 21,665.74, \$23,470.22; c) $\approx$ 8.7 yr.

32.) a) 400, $\approx$ 520, $\approx$ 1214; $\approx$ 2059, $\approx$ 2396; $\approx$ 2478; b) $\frac{4200e^{-0.32t}}{(1+5.25e^{-0.32t})^2}$

§4.4 page 321 8.) $\approx$ 7.2 days

12.) $\approx$ 40.8 g

26.) a) 0.9%; b) 76.3%

32.) $\approx$ 6 hr.

§5.1 page 345 4.) $4x + C$

8.) $\frac{x^3}{3} - \frac{x^2}{2} + 2x + C$

20.) $\frac{3}{5}x^{5/3} + C$

28.) $\frac{1}{8}\sin 2\theta + C$

32.) $-\frac{5}{2}\cot 2x + C$

44.) $-\frac{3}{8}\cos 8x + \frac{11}{8}$

52.) $3t^2 + 30$

62.) a) $32.307e^{0.1049t} - 32.307$; b) 516; c) 1111; d)595

§5.2 page 359 2.) a) 35; b) 40.625

14.) $\frac{7}{12}$

§5.3 page 369 4.) 9

10.) $e^2 - 1 \approx 6.3891$

12.) $2\ln 4 \approx 2.773$

54.) $15\frac{3}{4}$

§5.4 page 378 2.) $\frac{3}{10}$

8.) $\frac{1}{3}$

24.) $62\frac{1}{2}$