

- §1.1 page 16 12.) slope:  $m = -3$ ,  $y$ -intercept:  $(0, 2)$   
 30.)  $\frac{1}{4}$   
 60.)  $\approx 0.0205$  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.)  $540^\circ$   
 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)  $\approx 0.25$  b)  $\approx 0.25$  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)  $-10x - 5h$ ; b)  $-50, -45, -40.5, -40.05$   
 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)  $2x - 1$ ; 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)  $\approx 3.866, 0.5$ ; 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.)  $(7x^5 + 3x^3 - 50)(72x^7 - \frac{21}{2}\sqrt{x}) + (35x^4 + 9x^2)(9x^8 - 7x\sqrt{x})$

32.)  $\frac{-17t^2 - 10t - 52}{(2t^2 - 3t - 7)^2}$

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)  $\approx 12920$ ; c) -158

§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  $(-1, \frac{13}{2})$ ; minimum at  $(\frac{2}{3}, \frac{113}{27})$

16.) maximum at  $(0, 3)$ ; minimums at  $(-4, -131)$ ,  $(4, -131)$

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

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

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  $(\pm\frac{1}{\sqrt{3}}, \frac{9}{4})$

44.)  $(2, 2)$

108.) a)  $(6.5, 797394.5)$ ; b)  $(3.04, 857206.15)$

§3.3 page 210 2.) 0

6.) 7

48.) a) 100; 50; 20; 2;  $\frac{100}{101}$  b) 0 c) 100

§3.4 page 225 8.) maximum of 4, minimum of  $-23$

16.) maximum of 12, minimum of  $-13$

22.) maximum of 2, minimum of  $-2$

50.) no absolute maximum or minimum

§3.5 page 235 2.) 35 and 35

18.) 4800 sq. yd.

20.)  $8.5 \times 8.5$  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.)  $6 \times 8$  yd.

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

14.) 10.17

§3.7 page 253 2.)  $\frac{2-y}{x+2y}; -\frac{4}{3}$

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

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

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

38.)  $-0.0408 \text{ m}^2/\text{month}$

40.)  $2.083 \text{ ft/sec}$

§4.1 page 275 8.)  $52.5; 55.125; 63.814$

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

26.)  $\cos x - \sin x e^x$

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) falls by 0.0274 deaths per 1000 population

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

40.)  $\approx 4.6$

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)  $P(t) = P_0 e^{0.08t}$ ; b)  $\approx \$ 21,665.74, \$23,470.22$ ; c)  $\approx 8.7 \text{ yr.}$

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.)  $\approx 8.06 \text{ days}$

12.)  $\approx 42.85 \text{ g}$

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

32.)  $\approx 8:00 \text{ pm.}$

§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.)  $-\frac{3}{8}\cos 8x + \frac{27}{8}$   
 52.)  $3t^2 + 30$   
 62.) a)  $32.307e^{0.1049t} - 32.307$ ; b) 516; c) 1111; d) 595

§5.2 page 359 2.) a) 60; b) 53.125

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