

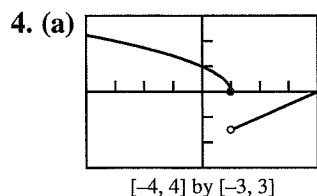
Chapter 1 Test Form B

1. (C)

2. (a) $y = -\frac{4}{3}x + 5$ (b) $y = \frac{3}{4}x - \frac{55}{4}$

3. (a) $(-\infty, -5] \cup [5, \infty)$

(b) $[-2, \infty)$ (c) Even



$[-4, 4]$ by $[-3, 3]$

(b) $(-\infty, \infty)$ (c) $(-1.5, \infty)$

5. (a) $(f \circ g)(x) = \frac{1}{5x^2 - 2}$

(b) $(g \circ f)(x) = \frac{5}{(x - 2)^2}$

6. Domain: $(-\infty, \infty)$

Range: $(-\infty, 9)$

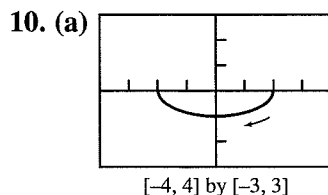
x-intercept: 2

y-intercept: 8

7. $x \approx -2.585$

8. About 2.41 years

9. One possible answer: $x = t, y = t^2 + 6t - 7, t \geq -3$



$[-4, 4]$ by $[-3, 3]$

(b) $\left(\frac{x}{2}\right)^2 + y^2 = 1$; lower half of ellipse

11. (C)

12. $f^{-1}(x) = x^2 - 5, x \leq 0$

13. (a) $y \approx -20.907 + 30.827 \ln x$

(b) $x \approx 31.05$ or about 31, in 2006

14. $\frac{35\pi}{6}$ m or about 18.33 m

15. Period: π ; Domain: $x \neq k\pi$ for integers k ;
Range: All reals

16. $x = \cos^{-1}\left(-\frac{1}{3}\right) \approx 1.911,$

$x = 2\pi - \cos^{-1}\left(-\frac{1}{3}\right) \approx 4.373$

Chapter 2

Quiz: Sections 2.1–2.2

1. (C)

2. (C)

3. (D)

4. (B)

5. (E)

6. (D)

7. (B)

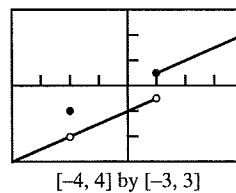
8. (A)

Quiz: Sections 2.3–2.4

1. (C)

2. (D)

3. One possible answer:



$[-4, 4]$ by $[-3, 3]$

4. (B)

5. (A)

6. (E)

7. (D)

Chapter 2 Test Form A

1. (a) 1

(b) -2

(c) Does not exist, because the left- and right-hand limits are different.

(d) 1

2. 10

3. (E)

4. $3; 3 - x^2 \leq 3 + x^2 \sin \frac{1}{x} \leq 3 + x^2$ and

$$\lim_{x \rightarrow 0} (3 - x^2) = \lim_{x \rightarrow 0} (3 + x^2) = 3,$$

$$\text{so } \lim_{x \rightarrow 0} \left(3 + x^2 \sin \frac{1}{x}\right) = 3.$$

5. (a) $\frac{2}{3}$

(b) $-\frac{2}{3}$

(c) $y = \frac{2}{3}, y = -\frac{2}{3}$

6. (C)

7. (a) $x = -4, x = 4$

(b) Left-hand limits at -4 and 4 are ∞ .

Right-hand limits at -4 and 4 are $-\infty$.

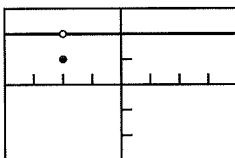
8. (a) e^x

(b) $-2x^3$

9. Removable discontinuity at $x = -2$;
infinite discontinuity at $x = -3$.

10. $a = -\frac{1}{4}$

11. One possible answer:



$[-4, 4]$ by $[-3, 3]$

12. Because h is a composite of two continuous functions: $h(x) = (g \circ f)(x)$, where $f(x) = x^2 - 4x - 6$ and $g(x) = |x|$.

13. 17

14. (a) 20 (b) $y = 20x - 20$

(c) $y = -0.05x + 20.1$

15. 45.6 m/sec

Chapter 2 Test Form B

1. (a) 2 (b) -1

(c) Does not exist, because the left- and right-hand limits are different.

(d) -1

2. -57 3. (A)

4. 5; $5 - x^2 \leq 5 - x^2 \cos \frac{1}{x} \leq 5 + x^2$

and $\lim_{x \rightarrow 0} (5 - x^2) = \lim_{x \rightarrow 0} (5 + x^2) = 5$,

so $\lim_{x \rightarrow 0} \left(5 - x^2 \cos \frac{1}{x}\right) = 5$.

5. (a) $-\frac{5}{4}$ (b) $\frac{5}{4}$

(c) $y = -\frac{5}{4}$, $y = \frac{5}{4}$

6. (C)

7. (a) $x = -4$, $x = 2$

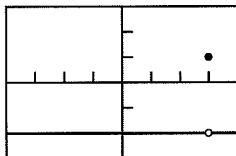
(b) Left-hand limits at -4 and 2 are $-\infty$.
Right-hand limits at -4 and 2 are ∞ .

8. (a) $3x^2$ (b) 7^{-x}

9. Removable discontinuity at $x = -3$; infinite discontinuity at $x = 3$.

10. $m = 2$

11. One possible answer:



$[-4, 4]$ by $[-3, 3]$

12. Because h is a composite of two continuous functions: $h(x) = (g \circ f)(x)$, where $f(x) = x^5 + 2x - 3$ and $g(x) = \sin x$.

13. -5

14. (a) 24 (b) $y = 24x - 48$

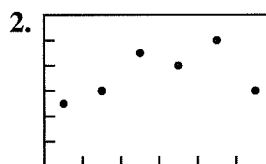
(c) $y = -\frac{1}{24}x + 48\frac{1}{6}$

15. 254.4 in./sec

Chapter 3

Quiz: Sections 3.1-3.3

1. (D)



$[0, 6]$ by $[0, 60]$

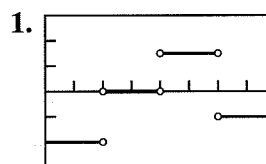
3. (E)

4. (C)

5. (C)

6. (B)

Quiz: Sections 3.4-3.6



$[0, 8]$ by $[-3, 3]$

2. (B)

3. (A)

4. (A)

5. (D)

6. (E)

7. (A)

Quiz: Sections 3.7-3.9

1. (B)

2. (D)

3. (E)

4. (A)

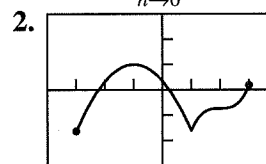
5. (A)

6. (C)

7. (D)

Chapter 3 Test Form A

1. $f'(2) = \lim_{h \rightarrow 0} \frac{[(2+h)^2 - 3] - (2^2 - 3)}{h} = 4$



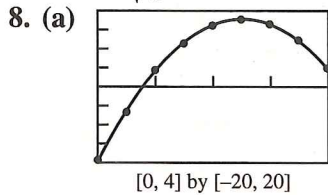
$[-4, 4]$ by $[-3, 3]$

3. (D)

4. (a) 500

(b) No, $f'(3)$ does not exist. Also, $f'(x)$ is zero for all x where $f'(x)$ is defined.

5. (a) $12x^3 - 27x^2 + 5$;
 (b) $36x^2 - 54x$
 6. (a) -12 (b) 360
 7. (a) 3 ft (b) 1 ft/sec
 (c) 19 ft/sec (d) 18 ft/sec²
 (e) $t = \sqrt{\frac{8}{3}} \approx 1.633$ sec



- (b) 18 ft/sec; 0 ft/sec; -12 ft/sec

9. $\frac{-\sin x - \sin x \tan x - \sec x}{(1 + \tan x)^2}$

10. $\left(\frac{\pi}{6}, \frac{2}{\sqrt{3}}\right), \left(\frac{5\pi}{6}, -\frac{2}{\sqrt{3}}\right)$

11. $2x \cos(x^2 - 1)$ (b) $y = 72x - 180$

13. (B) (d) $-\frac{2x + 5y}{5x + 5y^4}$

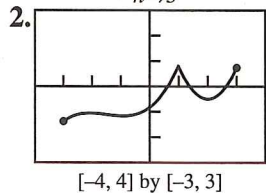
15. $\frac{-2}{4x^2 + 1}$

16. $-4^{-x+3} \ln 4$

17. (B)

Chapter 3 Test Form B

1. $f'(5) = \lim_{h \rightarrow 5} \frac{[(5+h)^2 + (5+h)] - (5^2 + 5)}{h} = 11$



3. (B)

4. (a) 100

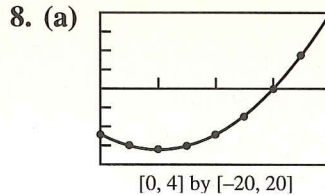
(b) No, since there is a vertical tangent at $x = 2$ and $f'(2)$ does not exist.

5. (a) $21x^2 + 8x - 6$ (b) $42x + 8$

6. (a) -198 (b) $-\frac{19}{27}$

7. (a) 225 ft (b) 45 ft/sec
 (c) 145 ft/sec (d) 60 ft/sec²

(e) $t = \sqrt{\frac{5}{6}} \approx 0.913$ sec



- (b) 0 ft/sec; 12 ft/sec; 20 ft/sec

9. $\frac{\sec^2 x + \sin x \sec^2 x - \sin x}{(1 + \sin x)^2}$

10. $\left(\frac{\pi}{3}, \sqrt{3}\right), \left(\frac{2\pi}{3}, -\sqrt{3}\right), \left(\frac{4\pi}{3}, \sqrt{3}\right), \left(\frac{5\pi}{3}, -\sqrt{3}\right)$

11. $-15x^2 \sin 5x^3$ (b) $y = \frac{1}{3}x + 16$

13. (E) (d) $\frac{3x^2 + 4y^2}{4y^3 - 8xy}$

15. $\frac{3}{\sqrt{1 - 9x^2}}$

16. $2 \cdot 3^{2x+5} \ln 3$

17. (C)

Chapter 4

Quiz: Sections 4.1–4.3

1. (D) (b) (B)
 2. (B)
 3. (A) (d) (E)
 4. (E)
 5. (D) (e) (D)
 6. (D)
 7. (B)

Quiz: Sections 4.4–4.6

1. (C) (b) (B)
 2. (B)
 3. (B) (d) (E)
 4. (E)
 5. (C) (e) (D)
 6. (D)
 7. (A)

Chapter 4 Test Form A

1. (a) Min: -2 , at $x = 2$
 Max: 2 , at $x = 0$
 (b) $(-\infty, 0) \cup (2, \infty)$ (c) $(0, 2)$
 (d) $(1, \infty)$ (e) $(-\infty, 1)$
 2. (a) $[-6, 0], [6, \infty)$ (b) $(-\infty, -6], [0, 6]$
 (c) $(-\infty, -\sqrt{12}), (\sqrt{12}, \infty)$
 (d) $(-\sqrt{12}, \sqrt{12})$
 (e) Min: -1313 at $x = \pm 6$
 Max: -17 at $x = 0$
 (f) $(-\sqrt{12}, -737), (\sqrt{12}, -737)$

3. (a) $[-1.327, 1.114]$
 (b) $(-\infty, -1.327], [1.114, \infty)$
 (c) $(-2.283, -0.233), (2.095, \infty)$
 (d) $(-\infty, -2.283), (-0.233, 2.095)$
 (e) Min: -0.926 at $x = -1.327$
 Max: 0.520 at $x = 1.114$
 (f) $(-2.283, -0.684), (-0.233, -0.245), (2.095, 0.384)$
4. (a) None (b) -3
 (c) $-\frac{5}{3}, 1$
5. $g(x) = 2x^2 + x - 52$
6. (a) About 7.705 cm by 9.705 cm by 2.148 cm
 (b) About 160.584 cm^3
7. (a) Possible answers:
 Increasing: $-4 \leq x \leq -1.5, 2 \leq x \leq 4$
 Decreasing: $-1.5 \leq x \leq 2$
 Local min: $x \approx 2$
 Local max: $x \approx -1.5$
 (b) $f'(x) = 4.919x^2 - 2.550x - 14.126$
 (c) $f(x) = 1.640x^3 - 1.275x^2 - 14.126x$
8. (a) $a = -6$ (b) $a = -18$
9. (C)
10. $L(x) = \frac{7}{2}x - \frac{3}{2}$ 11. $x \approx 1.830934$
12. (a) $dy = \frac{5}{5x-2}dx$ (b) $dy \approx 0.01875$
13. $\frac{25}{648} \approx 0.039 \text{ ft/min}$
14. $-\frac{180}{\sqrt{13}} \approx -49.9 \text{ ft/sec}$

Chapter 4 Test Form B

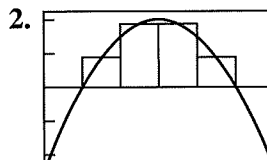
1. (a) Min: -2 at $x = -2$
 Max: 2 at $x = 0$
 (b) $(-2, 0)$ (c) $(-\infty, -2) \cup (0, \infty)$
 (d) $(-\infty, -1)$ (e) $(-1, \infty)$
2. (a) $(-\infty, -3], [0, 3]$ (b) $[-3, 0], [3, \infty)$
 (c) $(-\sqrt{3}, \sqrt{3})$ (d) $(-\infty, -\sqrt{3}), (\sqrt{3}, \infty)$
 (e) Min: 11 at $x = 0$
 Max: 92 at $x = \pm 3$
 (f) $(-\sqrt{3}, 56), (\sqrt{3}, 56)$
3. (a) $(-\infty, 0.106], [1.894, \infty)$
 (b) $[0.106, 1.894]$
 (c) $(-\infty, -0.175), (0.355, \infty)$
 (d) $(-0.175, 0.355)$
 (e) Min: 0.351 at $x \approx 1.894$
 Max: 1.053 at $x \approx 0.106$
 (f) $(-0.175, 0.727), (0.355, 0.875)$

4. (a) None (b) 4
 (c) $-2, 2$
5. $g(x) = 2x^3 - 47$
6. (a) About 5.873 cm by 13.873 cm by 2.063 cm
 (b) About 168.126 cm^3
7. (a) Possible answers:
 Increasing: $-2.5 \leq x \leq 3$
 Decreasing: $-4 \leq x \leq -2.5, 3 \leq x \leq 4$
 Local min: $x \approx -2.5$
 Local max: $x \approx 3$
 (b) $f'(x) = -4.869x^2 + 2.850x + 31.238$
 (c) $f(x) = -1.623x^3 + 1.425x^2 + 31.238x$
8. (a) $a = -50$ (b) $a = -24$
9. (B) 10. $L(x) = \frac{31}{4}x - 14$
11. $x \approx 2.506921$
12. (a) $dy = 3e^{3x-5}dx$ (b) $dy \approx 0.326$
13. $-\frac{432}{625\pi} \approx -0.220 \text{ ft}^3/\text{min}$
14. $\frac{145}{\sqrt{13}} \approx 40.2 \text{ ft/sec}$

Chapter 5

Quiz: Sections 5.1–5.3

1. (E)



$[0, 6]$ by $[-2.25, 2.25]$

3. (D) 4. (B)
 5. (C) 6. (C)
 7. (A)

Quiz: Sections 5.4–5.5

1. (B) 2. (C)
 3. (B) 4. (D)
 5. (D) 6. (C)
 7. (D)

Chapter 5 Test Form A

1. (a) ≈ 36.92 (b) 37.29
 2. ≈ 30.928 3. $\frac{3}{2}(a^4 - a^2)$
 4. ≈ 216.128 5. (B)
 6. 40 7. 1

6. One possible answer:

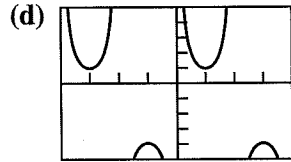
$$x = 4 + 5t, y = 11 - 8t, 0 \leq t \leq 1$$

7. $f^{-1}(x) = -\ln\left(\frac{3}{x} - \frac{2}{5}\right)$

8. (a) π

(b) $x \neq \frac{k\pi}{2}$ for integers k

(c) $(-\infty, -4] \cup [1, \infty)$



$[-\pi, \pi]$ by $[-5, 5]$

9. $x = \cos^{-1}(0.6) \approx 0.927,$

$$x = 2\pi - \cos^{-1}(0.6) \approx 5.356$$

10. (E)

11. $-\frac{14}{5}$

12. (a) 2

(b) $-\infty$

(c) -1

(d) ∞

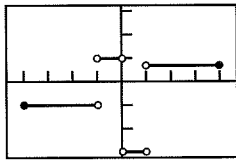
13. $g(x) = \frac{x-1}{x+5}$

14. (a) -64 ft/sec

(b) -96 ft/sec

15. No; function is discontinuous.

16.



$[-4.7, 4.7]$ by $[-3.1, 3.1]$

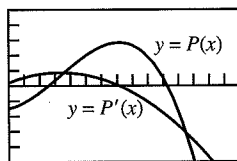
17. $\left(-\frac{4}{3}, 0\right) \cup (0, \infty)$

18. (D)

19. $\frac{x^2 + 8x + 10}{(x+4)^2}$

20. (a) $5x^4 + 24x^2 - 4x$ (b) $20x^3 + 48x - 4$

21. (a)



$[0, 15]$ by $[-5000, 5000]$

(b) \$840.00

(c) \$648.15

(d) \$2840.00

22. $\frac{10 \cos x - 2 + 2 \tan^2 x}{(5 - \sec x)^2}$

23. $12x^2 \sec^2(4x^3)$

24. 64

25. $y = -2x + \frac{3\sqrt{3}}{2}$

26. $-\frac{5 - y \cos xy}{6y - x \cos xy}$

27. $\frac{1}{|x+3|\sqrt{(x+3)^2-1}}$

28. (D)

29. $\frac{1}{x} - 2x e^{x^2}$

30. Min: -1 at $x = 2$

Max: 2 at $x = -1$

31. (a) $(-\infty, 1]$

(b) $[1, \infty)$

(c) $\left(-\frac{2}{3}, 0\right)$

(d) $\left(-\infty, -\frac{2}{3}\right), (0, \infty)$

(e) Min: None

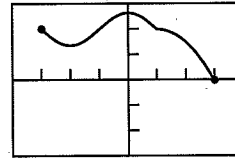
Max: $\frac{17}{12}$ at $x = 1$

(f) $\left(-\frac{2}{3}, -\frac{104}{81}\right), (0, 0)$

32. (E)

33. $f(x) = \frac{5x^2}{2} + 4x - \sin x + C$

34.



$[-4, 4]$ by $[-3, 3]$

35. (a) $V(x) = \left(\frac{36-2x}{2}\right)(20-2x)(x)$

$$= 2x^3 - 56x^2 + 360x$$

(b) Domain: $(0, 10)$

(c) Volume $\approx 672.504 \text{ in}^3$ at $x \approx 4.127$

36. (B)

37. $x_2 \approx 0.736$

38. (a) -243 ft³/sec

(b) -108 ft²/sec

(c) $-\frac{6}{6} \approx -0.497 \text{ ft/sec}$

39. $930 \text{ ft} \sqrt{146}$

40. $\int_3^{11} \left(5x^2 - \frac{3}{x}\right) dx$

41. (a) -4

(b) -1

(c) -67

42. $5 - \pi$

43. ≈ 4.985

44. (a) 186

(b) $\frac{93}{5}$

(c) $\frac{2}{\sqrt{3}} \approx 1.155$

45. (E)

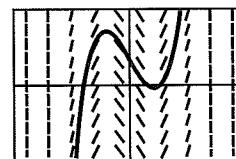
46. ≈ 10.783

Chapter 6

Quiz: Sections 6.1-6.3

1. (B)

2. $y = x^3 - 2x + 1$



$[-4, 4]$ by $[-3, 3]$

3. (C)

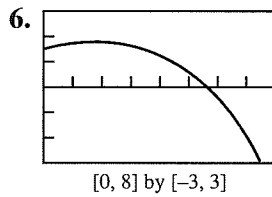
4. (C)

5. (D)

6. (A)

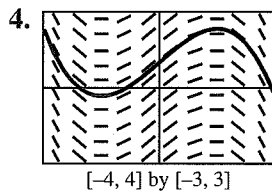
Quiz: Sections 6.4–6.6

1. (D) 2. (C)
 3. (D) 4. (B)
 5. (D)



Chapter 6 Test Form A

1. (D) 2. $\frac{1}{3}e^{3x} - 4 \sin x + C$
 3. $y = \frac{5}{3}x^3 - 7x - 12$



5. $\frac{1}{6}(\ln x)^6 + C$ 6. $e - 1$
 7. $y = \sqrt[3]{\sin x + 125}$
 8. $x \cos^{-1} 2x - \frac{1}{2}\sqrt{1 - 4x^2} + C$
 9. $(4x^2 - 11x + 11)e^x + C$
 10. $t \sin(\ln t) + t \cos(\ln t) + C$
 11. (a) 0.578 year (b) 3.260 years
 12. (a) 300 m (b) 20.8 sec
 13. (a) $\frac{dP}{dt} = 0.031P$ (b) $P = 56,800 e^{0.031t}$
 14. (a) $k = 0.08$; carrying capacity = 2000
 (b) $P = \frac{2000}{1 + 199e^{-0.08t}}$
 (c) 46.8 years

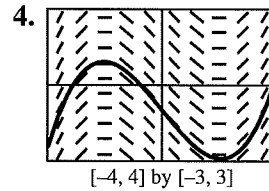
15. (D)

16.

| x | y |
|-----|-------|
| 2.0 | 3.500 |
| 2.1 | 2.158 |
| 2.2 | 1.530 |
| 2.3 | 1.264 |
| 2.4 | 1.183 |
| 2.5 | 1.201 |
| 2.6 | 1.274 |
| 2.7 | 1.381 |
| 2.8 | 1.513 |
| 2.9 | 1.665 |
| 3.0 | 1.837 |

Chapter 6 Test Form B

1. (A) 2. $\frac{1}{3} \sin 3x - 5e^x + C$
 3. $y = 2x^4 + 5x - 35$



5. $\frac{1}{4}e^{x^4+2x^2} + C$ 6. -1
 7. $y = \tan^{-1}(x^2 - 9)$
 8. $x \cot^{-1} 3x + \frac{1}{6} \ln(1 + 9x^2) + C$
 9. $\frac{1}{13}(3 \sin 2x - 2 \cos 2x)e^{3x} + C$
 10. $(t^4 - 2t^2 + 2)e^{t^2} + C$
 11. (a) 0.433 year (b) 2.012 years
 12. (a) 2000 m (b) 87.1 sec
 13. (a) $\frac{dP}{dt} = 0.047P$
 (b) $P = 83,400 e^{0.047t}$
 14. (a) $k = 0.06$; carrying capacity = 800
 (b) $P = \frac{800}{1 + 31e^{-0.06t}}$
 (c) 61.4 years
 15. (C)
16.

| x | y |
|-----|-------|
| 1.0 | 2.500 |
| 1.1 | 2.042 |
| 1.2 | 1.840 |
| 1.3 | 1.754 |
| 1.4 | 1.732 |
| 1.5 | 1.749 |
| 1.6 | 1.787 |
| 1.7 | 1.837 |
| 1.8 | 1.892 |
| 1.9 | 1.949 |
| 2.0 | 2.006 |

Chapter 7

Quiz: Sections 7.1–7.3

1. (C) 2. (A)
 3. (D) 4. (B)
 5. (A) 6. (C)
 7. (B)

Quiz: Sections 7.4–7.5

1. (E) 2. (E)
 3. (B) 4. (E)
 5. (D) 6. (D)

Chapter 7 Test Form A

1. (a) Right: $t > 2$; left: $0 \leq t < 2$; stopped: $t = 2$
 (b) $\frac{65}{3}$ m (c) $\frac{97}{3}$ m
 2. (a) At $x = -4$ m (b) 13 m
 3. About \$2183 billion 4. $\frac{96}{5}$
 5. $\frac{500}{3}$ 6. (C)
 7. $\left(\frac{189}{5} + 36 \ln \frac{2}{5}\right)\pi \approx 15.122$
 8. $\frac{13\pi}{3}$ 9. $\frac{61\pi}{432}$
 10. $\frac{27}{2}$ 11. (E)
 12. 40 13. 48 in.-lb
 14. About 488,580 ft-lb
 15. (a) About 16% (using 68-95-99.7 rule)
 or 15.9% (using NINT)
 (b) About 51.7% (c) About 233 fish

Chapter 7 Test Form B

1. (a) Right: $0 \leq t < 3$; left: $t > 3$; stopped: $t = 3$
 (b) -18 m (c) 54 m
 2. (a) At $x = 3$ m (b) $\frac{19}{2}$ m
 3. About \$1351 billion 4. $\frac{448}{15}$
 5. $\frac{256}{3}$ 6. (B)
 7. $(15 - 8 \ln 4)\pi \approx 12.283$
 8. $\frac{52\pi}{3}$ 9. $\frac{98\pi}{81}$
 10. 48 11. (A)
 12. 48 13. 150 in.-lb
 14. About 24,127 ft-lb
 15. (a) About 2.5% (using 68-95-99.7 rule)
 or 2.3% (using NINT)
 (b) About 33.4% (c) About 158 snakes

Chapter 8

Quiz: Sections 8.1–8.2

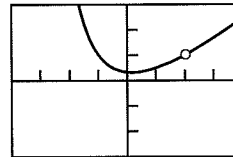
1. (C) 2. (D)
 3. (C) 4. (B)
 5. (B) 6. (C)
 7. (B) 8. (C)

Quiz: Sections 8.3–8.4

1. (D) 2. (A)
 3. (B) 4. (C)
 5. (D) 6. (D)
 7. (A)

Chapter 8 Test Form A

1. 1



$[-4, 4]$ by $[-3, 3]$

2. (a)

| x | $f(x)$ |
|--------|--------|
| 10 | 1.5383 |
| 10^2 | 1.7299 |
| 10^3 | 1.7480 |
| 10^4 | 1.7498 |
| 10^5 | 1.7500 |

Limit: 1.75

(b) $\lim_{x \rightarrow \infty} f(x) = \lim_{x \rightarrow \infty} \frac{14x - 8}{8x}$
 $= \lim_{x \rightarrow \infty} \frac{14}{8} = 1.75$

3. $e^{2.5}$

4. L'Hôpital's rule cannot be applied to

$\lim_{x \rightarrow \infty} \frac{\sin(1/x)}{e^{1/x}}$ because it corresponds to $\frac{0}{1}$, which is not an indeterminate form.

5. (B)

6. $(\ln x)^2, 3x^5 x^6, e^{2x}$

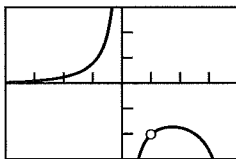
7. One possible answer:

$\lim_{x \rightarrow \infty} \frac{5^x}{5^{x-3}} = 125$, so f_1 and f_2 grow at the same rate. $\lim_{x \rightarrow \infty} \frac{5^x + 3^x}{5^x} = \lim_{x \rightarrow \infty} \left[1 + \left(\frac{3}{5}\right)^x\right] = 1$, so f_1 and f_3 grow at the same rate. By transitivity, f_2 and f_3 grow at the same rate.

8. (E)
 9. (a) Diverges (b) Converges
 (c) Diverges
 10. 3 11. 3
 12. 7 13. $\frac{3}{x} + \frac{4}{x^2} - \frac{5}{x+2}$
 14. $6 \ln|x-3| - 2 \ln|x+4| + C$
 15. $\ln|y-2| - \ln|y| = 2 \sin x - 2 \sin 1$
 16. $\frac{1}{5}(36 - x^2)^{5/2} - 12(36 - x^2)^{3/2} + C$

Chapter 8 Test Form B

1. -2



[-4, 4] by [-3, 3]

2. (a)

| x | f(x) |
|-----------------|--------|
| 10 | 1.9147 |
| 10 ² | 1.6943 |
| 10 ³ | 1.6694 |
| 10 ⁴ | 1.6669 |
| 10 ⁵ | 1.6667 |

Limit: $\frac{5}{3}$

(b) $\lim_{x \rightarrow \infty} f(x) = \lim_{x \rightarrow \infty} \frac{10x}{6x-5}$
 $= \lim_{x \rightarrow \infty} \frac{10}{6} = \frac{5}{3}$

3. e^6

4. L'Hôpital's rule cannot be applied to

$\lim_{x \rightarrow 0} \frac{4x^2 - 5x + 1}{2x^2 + 3x - 5}$ because it corresponds to $-\frac{1}{5}$, which is not an indeterminate form.

5. (A) 6. $(\ln x)^3, 4x^2, e^{2x}, 10^x$

7. One possible answer:

$\lim_{x \rightarrow \infty} \frac{2x^5 + x^2}{x^5} = \lim_{x \rightarrow \infty} (2 + x^{-3}) = 2$, so f_1 and f_2 grow at the same rate.

$\lim_{x \rightarrow \infty} \frac{x^5 + \ln x}{x^5} = \lim_{x \rightarrow \infty} \left(1 + \frac{\ln x}{x^5}\right) = 1$, so f_1 and f_3 grow at the same rate. By transitivity, f_2 and f_3

grow at the same rate.

8. (B)

9. (a) Diverges (b) Diverges
 (c) Converges

10. $\frac{1}{4}$ 11. 1
 12. 4 13. $\frac{5}{x} + \frac{2}{x-1} - \frac{4}{(x-1)^2}$
 14. $3 \ln|x+5| - 2 \ln|x-1| + C$
 15. $-3 \cos y = \ln|x| - \ln|x+3| + \ln 4$
 16. $\frac{49}{\sqrt{49-x^2}} + \sqrt{49-x^2} + C$

Chapter 9

Quiz: Sections 9.1-9.3

1. (A) 2. (D)
 3. (C) 4. (A)
 5. (C) 6. (B)
 7. (D) 8. (B)
 9. (D)

Quiz: Sections 9.4-9.5

1. (C) 2. (E)
 3. (C) 4. (E)
 5. (C) 6. (B)
 7. (C)

Chapter 9 Test Form A

1. $\frac{x^2}{5} + \frac{x^3}{8} + \frac{x^4}{11} + \frac{x^5}{14}$ 2. Converges to $\frac{8}{3}$

3. $\sum_{n=0}^{\infty} 0.621(0.001)^n = \frac{23}{37}$

4. $x^3 - x^5 + x^7 - \dots + (-1)^n x^{2n+3} + \dots$

5. $1 - 2\left(x - \frac{\pi}{4}\right)^2$

6. $P_3(x) = 5 - 3x + 4x^2 + 4x^3$;
 $f(0.4) \approx 4.696$

7. (a) 3

(b) $2x + 3x^2 + 2x^3 + \dots + \frac{(n+1)x^n}{(n-1)!} + \dots$

(c) $x + x^2 + \frac{x^3}{2} + \frac{x^4}{6} + \dots + \frac{x^{n+1}}{n!} + \dots$

8. $P_4(x) = -x^2 - \frac{x^4}{2}$; $f(0.3) \approx -0.09405$

9. (a) $\approx 3.642 \times 10^{-5}$ (b) $\approx 3.535 \times 10^{-5}$

10. (C)

11. Tests used may vary.

- (a) Diverges by Ratio Test
 (b) Converges by Ratio Test.
 (c) Diverges by n th-Term Test.