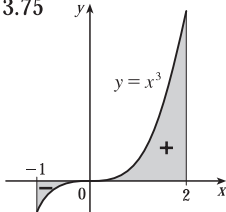
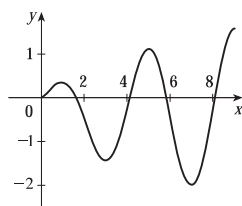


(a), (b) x^2

7. $g'(x) = 1/(x^3 + 1)$
 9. $g'(y) = y^2 \sin y$ 11. $F'(x) = -\sqrt{1 + \sec x}$
 13. $h'(x) = -\frac{\arctan(1/x)}{x^2}$ 15. $y' = \sqrt{\tan x + \sqrt{\tan x} \sec^2 x}$
 17. $y' = \frac{3(1 - 3x)^3}{1 + (1 - 3x)^2}$ 19. $\frac{3}{4}$ 21. 63
 23. $\frac{5}{9}$ 25. $\frac{7}{8}$ 27. $\frac{156}{7}$ 29. $\frac{40}{3}$ 31. 1 33. $\frac{49}{3}$
 35. $\ln 3$ 37. π 39. $e^2 - 1$ 41. 0
 43. The function $f(x) = x^{-4}$ is not continuous on the interval $[-2, 1]$, so FTC2 cannot be applied.
 45. The function $f(\theta) = \sec \theta \tan \theta$ is not continuous on the interval $[\pi/3, \pi]$, so FTC2 cannot be applied.
 47. $\frac{243}{4}$ 49. 2
 51. 3.75



53. $g'(x) = \frac{-2(4x^2 - 1)}{4x^2 + 1} + \frac{3(9x^2 - 1)}{9x^2 + 1}$
 55. $y' = 3x^{7/2} \sin(x^3) - \frac{\sin \sqrt{x}}{2\sqrt{x}}$ 57. $\sqrt{257}$ 59. 29
 61. (a) $-2\sqrt{n}, \sqrt{4n - 2}$, n an integer > 0
 (b) $(0, 1)$, $(-\sqrt{4n - 1}, -\sqrt{4n - 3})$, and $(\sqrt{4n - 1}, \sqrt{4n + 1})$, n an integer > 0 (c) 0.74
 63. (a) Loc. max. at 1 and 5; loc. min. at 3 and 7
 (b) $x = 9$
 (c) $(\frac{1}{2}, 2)$, $(4, 6)$, $(8, 9)$
 (d) See graph at right.

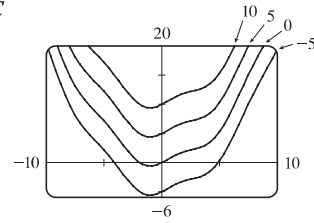


65. $\frac{1}{4}$ 73. $f(x) = x^{3/2}$, $a = 9$
 75. (b) Average expenditure over $[0, t]$; minimize average expenditure

EXERCISES 5.4 ■ PAGE 397

5. $\frac{1}{3}x^3 - (1/x) + C$ 7. $\frac{1}{5}x^5 - \frac{1}{8}x^4 + \frac{1}{8}x^2 - 2x + C$
 9. $2t - t^2 + \frac{1}{3}t^3 - \frac{1}{4}t^4 + C$ 11. $\frac{1}{3}x^3 - 4\sqrt{x} + C$
 13. $-\cos x + \cosh x + C$ 15. $\frac{1}{2}\theta^2 + \csc \theta + C$
 17. $\tan \alpha + C$

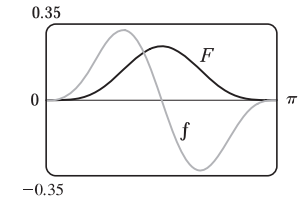
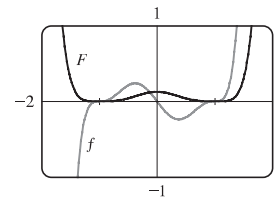
19. $\sin x + \frac{1}{4}x^2 + C$



21. 18 23. $-2 + 1/e$ 25. 52
 27. $\frac{256}{15}$ 29. $-\frac{63}{4}$ 31. $\frac{55}{63}$ 33. $2\sqrt{5}$ 35. 8
 37. $1 + \pi/4$ 39. $\frac{256}{5}$ 41. $\pi/6$ 43. -3.5
 45. 0, 1.32; 0.84 47. $\frac{4}{3}$
 49. The increase in the child's weight (in pounds) between the ages of 5 and 10
 51. Number of gallons of oil leaked in the first 2 hours
 53. Increase in revenue when production is increased from 1000 to 5000 units
 55. Newton-meters (or joules) 57. (a) $-\frac{3}{2}$ m (b) $\frac{41}{6}$ m
 59. (a) $v(t) = \frac{1}{2}t^2 + 4t + 5$ m/s (b) $416\frac{2}{3}$ m
 61. $46\frac{2}{3}$ kg 63. 1.4 mi 65. \$58,000
 67. (b) At most 40%; $\frac{5}{36}$

EXERCISES 5.5 ■ PAGE 406

1. $-e^{-x} + C$ 3. $\frac{2}{9}(x^3 + 1)^{3/2} + C$ 5. $-\frac{1}{4}\cos^4 \theta + C$
 7. $-\frac{1}{2}\cos(x^2) + C$ 9. $\frac{1}{63}(3x - 2)^{21} + C$
 11. $\frac{1}{3}(2x + x^2)^{3/2} + C$ 13. $-\frac{1}{3}\ln|5 - 3x| + C$
 15. $-(1/\pi)\cos \pi t + C$ 17. $\frac{2}{3}\sqrt{3ax + bx^3} + C$
 19. $\frac{1}{3}(\ln x)^3 + C$ 21. $2\sin \sqrt{t} + C$ 23. $\frac{1}{7}\sin^7 \theta + C$
 25. $\frac{2}{3}(1 + e^x)^{3/2} + C$ 27. $\frac{1}{2}(1 + z^3)^{2/3} + C$ 29. $e^{\tan x} + C$
 31. $-1/(\sin x) + C$ 33. $-\frac{2}{3}(\cot x)^{3/2} + C$
 35. $-\ln(1 + \cos^2 x) + C$ 37. $\ln|\sin x| + C$
 39. $\frac{1}{3}\sec^3 x + C$ 41. $\ln|\sin^{-1} x| + C$
 43. $\tan^{-1} x + \frac{1}{2}\ln(1 + x^2) + C$
 45. $\frac{4}{7}(x + 2)^{7/4} - \frac{8}{3}(x + 2)^{3/4} + C$
 47. $\frac{1}{8}(x^2 - 1)^4 + C$ 49. $\frac{1}{4}\sin^4 x + C$



51. 0 53. $\frac{182}{9}$ 55. 4
 57. 0 59. $e - \sqrt{e}$ 61. 3 63. $\frac{1}{3}(2\sqrt{2} - 1)a^3$
 65. $\frac{16}{15}$ 67. 2 69. $\ln(e + 1)$ 71. $\sqrt{3} - \frac{1}{3}$
 73. 6π 75. All three areas are equal. 77. ≈ 4512 L
 79. $\frac{5}{4\pi}\left(1 - \cos \frac{2\pi t}{5}\right)$ L 81. 5 87. $\pi^2/4$

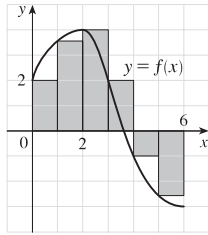
CHAPTER 5 REVIEW ■ PAGE 409

True-False Quiz

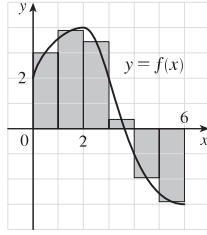
- I. True 3. True 5. False 7. True 9. True
 11. False 13. False 15. False

Exercises

1. (a) 8



(b) 5.7



3. $\frac{1}{2} + \pi/4$ 5. 3 7. f is c , f' is b , $\int_0^x f(t) dt$ is a
 9. 37 11. $\frac{9}{10}$ 13. -76 15. $\frac{21}{4}$ 17. Does not exist
 19. $\frac{1}{3} \sin 1$ 21. 0 23. $-(1/x) - 2 \ln|x| + x + C$
 25. $\sqrt{x^2 + 4x} + C$ 27. $[1/(2\pi)] \sin^2 \pi t + C$
 29. $2e^{\sqrt{x}} + C$ 31. $-\frac{1}{2} [\ln(\cos x)]^2 + C$
 33. $\frac{1}{4} \ln(1 + x^4) + C$ 35. $\ln|1 + \sec \theta| + C$ 37. $\frac{23}{3}$
 39. $2\sqrt{1 + \sin x} + C$ 41. $\frac{64}{5}$ 43. $F'(x) = x^2/(1 + x^3)$
 45. $g'(x) = 4x^3 \cos(x^8)$ 47. $y' = (2e^x - e^{\sqrt{x}})/(2x)$
 49. $4 \leq \int_1^3 \sqrt{x^2 + 3} dx \leq 4\sqrt{3}$ 55. 0.280981
 57. Number of barrels of oil consumed from Jan. 1, 2000, through Jan. 1, 2008
 59. 72,400 61. 3 63. $c \approx 1.62$
 65. $f(x) = e^{2x}(1 + 2x)/(1 - e^{-x})$ 71. $\frac{2}{3}$

PROBLEMS PLUS ■ PAGE 413

1. $\pi/2$ 3. $f(x) = \frac{1}{2}x$ 5. -1 7. e^{-2} 9. $[-1, 2]$
 11. (a) $\frac{1}{2}(n-1)n$ (b) $\frac{1}{2}[[b]](2b - [[b]] - 1) - \frac{1}{2}[[a]](2a - [[a]] - 1)$
 17. $2(\sqrt{2} - 1)$

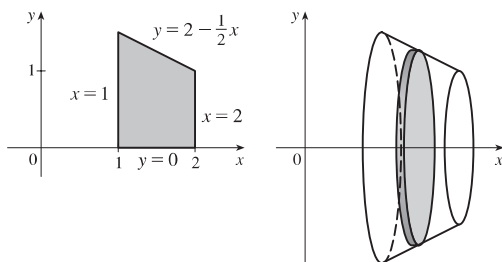
CHAPTER 6

EXERCISES 6.1 ■ PAGE 420

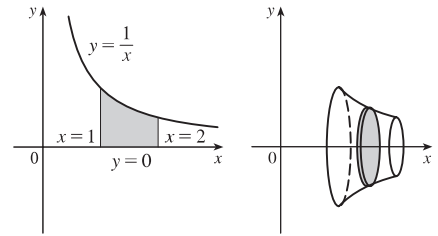
1. $\frac{32}{3}$ 3. $e - (1/e) + \frac{10}{3}$ 5. 19.5 7. $\frac{1}{6}$ 9. $\ln 2 - \frac{1}{2}$
 11. $\frac{1}{3}$ 13. 72 15. $2 - 2 \ln 2$ 17. $\frac{59}{12}$ 19. $\frac{32}{3}$
 21. $\frac{8}{3}$ 23. $\frac{1}{2}$ 25. $\pi - \frac{2}{3}$ 27. $\ln 2$ 29. 6.5
 31. $\frac{3}{2}\sqrt{3} - 1$ 33. 0.6407 35. 0, 0.90; 0.04 37. 8.38
 39. $12\sqrt{6} - 9$ 41. $117\frac{1}{3}$ ft 43. 4232 cm²
 45. (a) Car A (b) The distance by which A is ahead of B after 1 minute (c) Car A (d) $t \approx 2.2$ min
 47. $\frac{24}{5}\sqrt{3}$ 49. $4^{2/3}$ 51. ± 6
 53. $0 < m < 1$; $m - \ln m - 1$

EXERCISES 6.2 ■ PAGE 430

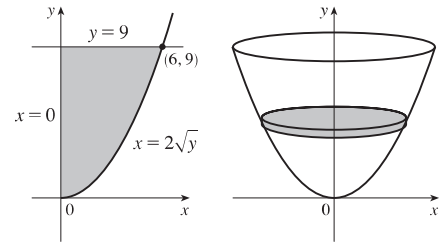
1. $19\pi/12$



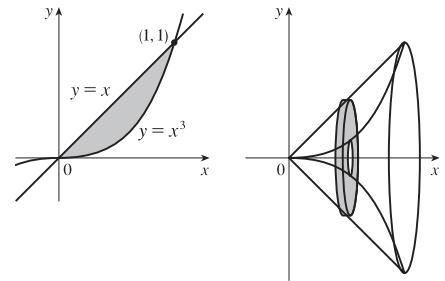
3. $\pi/2$



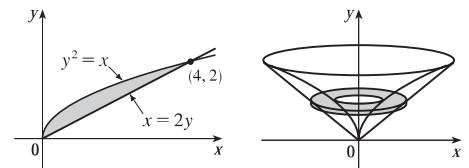
5. 162π



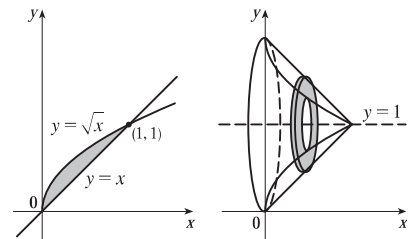
7. $4\pi/21$



9. $64\pi/15$



11. $\pi/6$



13. $2\pi(\frac{4}{3}\pi - \sqrt{3})$

