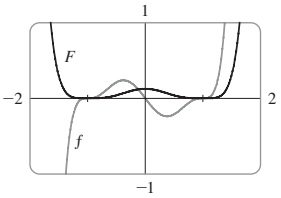
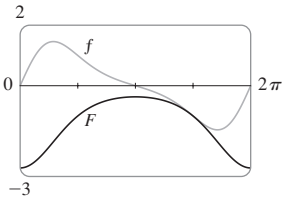
65. Total number of heart beats during the first 30 min of exercise
67. Newton-meters (or joules) **69.** (a) $-\frac{3}{2}$ m (b) $\frac{41}{6}$ m
71. (a) $v(t) = \frac{1}{2}t^2 + 4t + 5$ m/s (b) $416\frac{2}{3}$ m
73. $46\frac{2}{3}$ kg **75.** ≈1.37 mi **77.** $58,000
79. 39.8 ft/s **81.** 5443 bacteria
83. 332.6 gigawatt-hours

EXERCISES 5.5 ■ PAGE 425

1. $\frac{1}{2}\sin 2x + C$ **3.** $\frac{2}{9}(x^3 + 1)^{3/2} + C$
5. $\frac{1}{4}\ln|x^4 - 5| + C$ **7.** $2\sin\sqrt{t} + C$
9. $-\frac{1}{3}(1 - x^2)^{3/2} + C$ **11.** $-\frac{1}{4}e^{-t^4} + C$
13. $-(3/\pi)\cos(\pi t/3) + C$ **15.** $\frac{1}{4}\ln|4x + 7| + C$
17. $\ln|1 + \sin\theta| + C$ **19.** $-\frac{1}{4}\cos^4\theta + C$
21. $\dfrac{1}{1 - e^u} + C$ **23.** $\frac{2}{3}\sqrt{3ax + bx^3} + C$
25. $\frac{1}{3}(\ln x)^3 + C$ **27.** $\frac{1}{4}\tan^4\theta + C$
29. $\dfrac{1}{12}\left(x^2 + \dfrac{2}{x}\right)^6 + C$ **31.** $\dfrac{2}{15}(2 + 3e^r)^{5/2} + C$
33. $\ln|\tan\theta| + C$ **35.** $\frac{1}{3}(\arctan x)^3 + C$
37. $-\dfrac{1}{\ln 5}\cos(5^t) + C$ **39.** $\frac{1}{5}\sin(1 + 5t) + C$
41. $-\frac{2}{3}(\cot x)^{3/2} + C$ **43.** $\frac{1}{3}\sinh^3 x + C$
45. $-\ln(1 + \cos^2 x) + C$ **47.** $\ln|\sin x| + C$
49. $\ln|\sin^{-1}x| + C$ **51.** $\tan^{-1}x + \frac{1}{2}\ln(1 + x^2) + C$
53. $\frac{1}{40}(2x + 5)^{10} - \frac{5}{36}(2x + 5)^9 + C$
55. $\frac{1}{8}(x^2 - 1)^4 + C$ **57.** $-e^{\cos x} + C$





59. $2/\pi$ **61.** $\frac{45}{28}$ **63.** $2/\sqrt{3} - 1$ **65.** $e - \sqrt{e}$
67. 0 **69.** 3 **71.** $\frac{1}{3}(2\sqrt{2} - 1)a^3$ **73.** $\frac{16}{15}$ **75.** 2
77. $\ln(e + 1)$ **79.** $\frac{1}{6}$ **81.** $\sqrt{3} - \frac{1}{3}$ **83.** 6π
85. All three areas are equal. **87.** ≈4512 L
89. $\dfrac{5}{4\pi}\left(1 - \cos\dfrac{2\pi t}{5}\right)$ L
91. $C_0(1 - e^{-30r/V})$; the total amount of urea removed from the blood in the first 30 minutes of dialysis treatment
93. 5 **99.** $\pi^2/4$

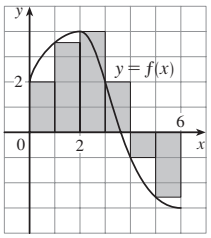
CHAPTER 5 REVIEW ■ PAGE 428

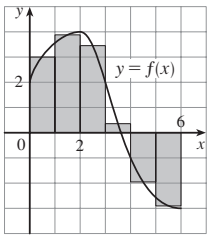
True-False Quiz

1. True **3.** True **5.** False **7.** True **9.** False
11. True **13.** False **15.** True **17.** False
19. 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. 3, 0 **11.** $-\frac{13}{6}$ **13.** $\frac{9}{10}$ **15.** −76 **17.** $\frac{21}{4}$
19. Does not exist **21.** $\frac{1}{3}\sin 1$ **23.** 0
25. $\frac{1}{2}\ln(x^2 + 1) + C$ **27.** $\sqrt{x^2 + 4x} + C$
29. $[1/(2\pi)]\sin^2\pi t + C$ **31.** $2e^{\sqrt{x}} + C$
33. $-\frac{1}{2}[\ln(\cos x)]^2 + C$ **35.** $\frac{1}{4}\ln(1 + x^4) + C$
37. $\ln|1 + \sec\theta| + C$ **39.** $-\frac{3}{5}(1 - x)^{5/3} + \frac{3}{8}(1 - x)^{8/3} + C$
41. $\frac{23}{3}$ **43.** $2\sqrt{1 + \sin x} + C$ **45.** $\frac{64}{5}$ **47.** $\frac{124}{3}$
49. (a) 2 (b) 6 **51.** $F'(x) = x^2/(1 + x^3)$
53. $g'(x) = 4x^3\cos(x^8)$ **55.** $y' = \left(2e^x - e^{\sqrt{x}}\right)/(2x)$
57. $4 \leqslant \int_1^3 \sqrt{x^2 + 3}\,dx \leqslant 4\sqrt{3}$ **63.** 0.2810
65. Number of barrels of oil consumed from Jan. 1, 2015, through Jan. 1, 2020
67. 72,400 **69.** 3 **71.** $c \approx 1.62$
73. $f(x) = e^{2x}(2x - 1)/(1 - e^{-x})$

PROBLEMS PLUS ■ PAGE 433

1. $\pi/2$ **3.** $2k$ **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. $y = -\dfrac{2b}{a^2}x^2 + \dfrac{3b}{a}x$ **19.** $2\left(\sqrt{2} - 1\right)$

CHAPTER 6

EXERCISES 6.1 ■ PAGE 442

1. (a) $\int_0^2 (2x - x^2)\,dx$ (b) $\frac{4}{3}$
3. (a) $\int_{-1}^1 (e^y - y^2 + 2)\,dy$ (b) $e - (1/e) + \frac{10}{3}$
5. 8 **7.** $\int_0^1 (3^x - 2^x)\,dx$ **9.** $\int_1^2 (-x^2 + 3x - 2)\,dx$
11. $\frac{23}{6}$ **13.** $\ln 2 - \frac{1}{2}$ **15.** $\frac{9}{2}$ **17.** $\frac{8}{3}$ **19.** 72
21. $\frac{32}{3}$ **23.** 4 **25.** 9 **27.** $\frac{1}{2}$ **29.** $6\sqrt{3}$
31. $\frac{13}{5}$ **33.** $(4/\pi) - \frac{1}{2}$ **35.** $\ln 2$
37. (a) 39 (b) 15 **39.** $\frac{1}{6}\ln 2$ **41.** $\frac{5}{2}$
43. $\frac{3}{2}\sqrt{3} - 1$ **45.** 0, 0.896; 0.037
47. −1.11, 1.25, 2.86; 8.38 **49.** 2.80123 **51.** 0.25142
53. $12\sqrt{6} - 9$ **55.** $117\frac{1}{3}$ ft **57.** 4232 cm²