

Chapter 5 check your understanding:

1. T, 3. F, 5. F, 6. T, 7. F, 11. T

Chapter 6 check your understanding:

3. T, 5. F, 6. F, 7. T, 9. T, 11. T, 12. T

Chapter 7 check your understanding:

10. T, 11. F, 12. T

Final review problems:

7. a. $\frac{2}{\pi}$, b. 6

17. a. $x + b \ln|x| + C$, b. $x + b - b \ln|x + b| + C$, c. $b \arctan(x) + C$, d.

$\frac{1}{2b} \ln|x^2 + 1| + C$

29. a. $\frac{1}{2 \cos^2 x} + C$, b. $\frac{1}{2} \ln|e^{2x} + 1| + C$

30. $\frac{1}{3} (x^2 + 9)^{3/2} \Big|_0^4 = \frac{98}{3}$

31. $\int_0^{\ln 2} (2 - e^x) dx = 2 \ln 2 - 1$

32. a. $\frac{82}{7}$, b. $\frac{52}{9}$

33. a. $-\frac{1}{2} e^{-2x} + C$, b. 60

34. $\int_{-4}^4 (16 - x^2) dx = \frac{256}{3}$

35. $\int_{-1}^1 e^x dx = e - \frac{1}{e}$

36. $\int_{-2}^3 (6 + x - x^2) dx = \frac{125}{6}$

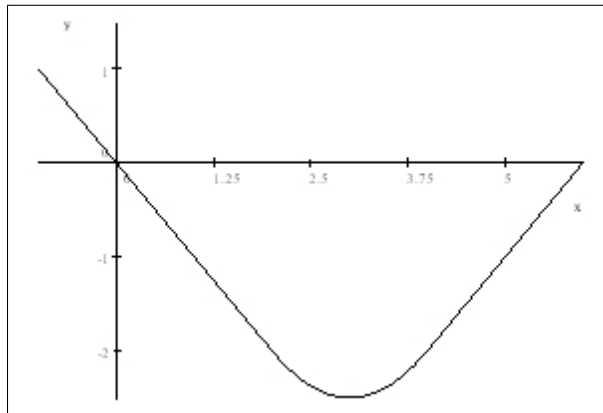
38. Left sum = $3.1(.2) + 3.2(.2) + 3.4(.2) + 3.6(.2) + 4(.2) = 3.46$

Right sum = $3.2(.2) + 3.4(.2) + 3.6(.2) + 4(.2) + 4.4(.2) = 3.72$

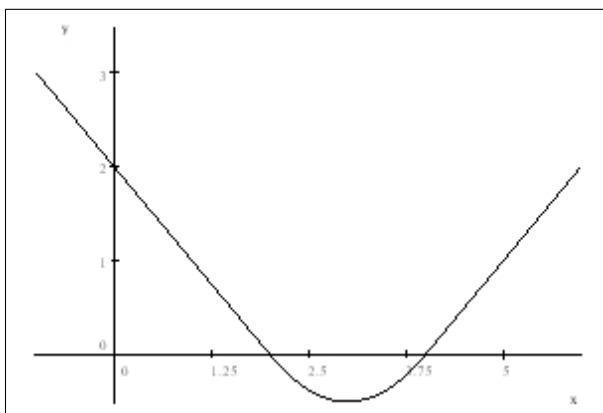
Better estimate = $(\text{left sum} + \text{right sum})/2 = (3.46 + 3.72)/2 = 3.59$

39. $C < E < F < A < B < D$

52. Here is an example of an antiderivative:



For the second part, only the one which satisfies $F(2) = 0$ is appropriate:



69. a. $\frac{1}{2} \ln |x^2 + 3| + C$, b. $\frac{1}{2}x^2 - 3 \ln |x| + C$
70. $\int_{-1}^4 (-x^2 + 3x + 4) dx = \frac{125}{6}$
71. See next picture file in next link (on webpage). It is a little hard to read. The labeled points are $(10, c)$ for acceleration, $(10, 5c)$ for velocity, and $(10, 50c/3)$ for distance.
72. a. The function is clearly even (from the graph) so the answer is $4\pi \ln(2)$
 b. The function is periodic and it is clear that $\int_0^{3\pi} \ln(5 + 4 \cos x) dx = 3 \int_0^\pi \ln(5 + 4 \cos x) dx = 6\pi \ln(2)$.
 c. Substitution yields $\frac{1}{2} \int_0^\pi \ln(5 + 4 \cos(2t)) dt = \pi \ln(2)$.
80. $A < D < B < F < C < E$
81. a. $\frac{e^2}{2} - \frac{1}{2e^2}$ b. 1 c. $-\frac{19}{12}$
85. a. $-\frac{2}{3}$ b. $-\frac{1}{4} \cos^4 x + C$
94. a. $v(t) = -5.3t$ ft/s. b. $h(t) = -(5.3)/2 t^2 + 100$ ft.
101. a. $f(0) < f(1) < f(-2) < f(-1) < f(2)$
 b. $f'(-1) < f'(0) < f'(1) < f'(2) < f'(-2)$
 c. $\int_{-1}^1 f(x) dx < \int_1^2 f(x) dx < \int_{-2}^{-1} f(x) dx$