Answers for Even-Numbered Problems
Unit 6

6.5

2. 0

10a. $\frac{4}{\pi}$

10b. $\frac{2}{\ln 3}$

10c. Sketch not provided – see solutions manual

14. $\frac{3 \pm \sqrt{5}}{2}$

6.1

8. $\frac{125}{6}$

12. $\frac{64}{3}$

22. $\frac{1}{2}$

50. $\frac{1}{12}$

52a. $a = \frac{8}{5}$

52b. $b = \frac{11 - 4\sqrt{6}}{8}$

6.2

6. $\frac{\pi\left(e^4 - e^2\right)}{2}$

8. $\frac{176\pi}{3}$

10. 2π

12. 9.525885

14. $\pi\left(2\sqrt{2} - \frac{3}{2}\right)$

24. $\frac{\pi}{9}$

26. $\frac{\pi}{15}$

30. $\frac{4\pi}{15}$

44. $V \approx 5.8 \text{ m}^3$

54. $\frac{16r^3}{3}$

58. 2

9.1

2. See solutions manual or ask in class

9.2

4. I

6. II

9.3

2. $y = \ln\left(\frac{x^2}{2} + C\right)$

4. $y = \sqrt[3]{3\ln|1+x| + C}$

10. $z = -\ln\left(e^t + C\right)$

12. $y = \sqrt{(\ln x)^2 + 4}$

16. $P = \frac{1}{9}\left(t^{3/2} + 3\sqrt{2} - 1\right)^2$

3.8

2a. $k = \ln 8$

2b. $P(t) = 60e^{(\ln 8)t}$

2c. $P(8) = 1,006,632,960$ bacteria

2d. $P'(8) = 2,093,234,394.25$ cells/hr (cannot get three places even in Float 12!!)

2e. $t = 2.793607$ hr

4a. $k = \frac{3\ln 2}{2}$

4b. 50 bacteria

4c. $y(t) = 50e^{\left(\frac{3\ln 2}{2}\right)t}$

4d. $y(4.5) = 5381.737058$ bacteria (5382 if asked to round to nearest whole bacteria)

4e. $y'(4.5) = 5595.503803$ bacteria/hr

4f. $t = 6.643856$ hr

8a. $y(t) = 50e^{\left(-\frac{\ln 2}{28}\right)t}$

8b. $y(40) = 18.574929$ mg

8c. $t = 130.027973$ days

10a. $t_{\text{half-life}} = 12.252835$ years

10b. $t = 28.450202$ years

14. $t = -1.588373$ hr → approx. 11:55 AM

16. $t = 20.273255$ min

20a. $t = 11.552453$ years

20b. $r = 0.0618837 \rightarrow 6.18837\%$