1. (a) \( \frac{2}{75} \)

(b) \( 2 + \ln 2 - \frac{3\pi}{8} \)

2. (a) \( -\frac{\sqrt{x^2 + 4}}{4x} + C \)

(b) \( \ln \left| x^{1/4} \right| - \ln \left| x^{1/4} - 2 \right| - \frac{6}{x^{1/4} - 2} + C \)

3. \( \frac{2}{e} \)

4. \( \cos(t) e^{\sin(t)} - 2e^{\sin(t^2)} - 4t^2 \cos(t^2) e^{\sin(t^2)} \)

5. \( \frac{27}{4} \)

6. \( \frac{4\pi}{3} \left( R^2 - r^2 \right)^{3/2} \)

7. 1,112 ft-lb

8. (a) \( \int_1^3 \sqrt{1 + 4x^2} \, dx \)

(b) \( \frac{1}{6} \left( \sqrt{5} + 4\sqrt{10} + 2\sqrt{17} + 4\sqrt{26} + \sqrt{37} \right) \)

9. \( y = \tan^{-1}(1 - t \cos t + \sin t) \)

10. (a) \( \frac{dP}{dt} = k(700 - P), \quad P(0) = 0 \)

(b) \( 700 \left( 1 - \left( \frac{4}{5} \right)^{t/20} \right) \)

(c) \( 20 \frac{\ln 2}{\ln(5/4)} \) days