1. (a) $12+2\ln(3)$

   (b) $\dfrac{\pi}{6}$

2. (a) $\dfrac{-1}{\sqrt{x^2-1}} - \operatorname{arcsec} x + C.$

   (b) $-\dfrac{\arctan x}{x} + \ln|x| - \dfrac{1}{2}\ln\left(1+x^2\right) + C$

3. (a) 2

   (b) ∞

4. 1771.84 Joules

5. $\bar{x} = \dfrac{1}{\pi} + \dfrac{\pi}{4}, \qquad \bar{y} = \dfrac{3}{8}$

6. (a) $\dfrac{3}{8}$

   (b) $\sqrt{\dfrac{8}{5}}$

7. (a) $\dfrac{192\pi}{5}$

   (b) $V = \displaystyle\int_0^2 \pi\left[(6-y^2)^2 - 2^2\right] dy$

8. (a) $L = \displaystyle\int_0^{\pi/2} \sqrt{1+\cos^2 x}\, dx$

   (b) $T_3 = \dfrac{\pi}{12}\left(\sqrt{2}+\sqrt{7}+\sqrt{5}+1\right) \approx 1.910$

9. $y = \tan\left(x + \dfrac{1}{2}x^2 - \dfrac{3}{2}\right)$

10. (a) $T = 4 - 14\,(5/7)^{t/4}$

    (b) about 19.1 hours