

1. (a) $\frac{1}{2} + \frac{3}{2}e^4$.
(b) $\frac{1}{2}(\ln(\sin x))^2 + C$.
(c) $\frac{(x+1)^{2007}}{2007} - \frac{(x+1)^{2006}}{2006} + C$
(d) $\ln \left| \frac{x-1 + \sqrt{x^2 - 2x - 3}}{2} \right| + C$
(e) $\frac{x^2}{2} - 2x - \ln|x| - \frac{2}{x} + 5 \ln|x+2| + C$
2. (a) $\frac{1}{4} \ln \left(\frac{b+2}{b+6} \right) - \frac{1}{4} \ln \left(\frac{2}{6} \right)$
(b) $-\frac{1}{4} \ln \left(\frac{2}{6} \right)$.
3. $\frac{4}{\pi} + 2$.
4. $4\sqrt{257}$
5. 208 lb-ft.
6. (a) $\frac{1}{3}b^2 + \frac{1}{2}$
(b) (5 points) $M = \sqrt{\frac{3}{2}}$
7. (a) $V = \int_0^1 2\pi x(x + \sin(\pi x)) dx$
(b) $V = \int_0^1 \pi(x + \sin(\pi x))^2 dx$
8. (a) $\frac{dy}{dt} = k(y - 380), \quad y(0) = 60$
(b) $k = \frac{1}{2} \ln(.75)$ and $y = 380 - 320e^{kt}$
(c) 2.928
9. (9 points) approximately 53.62