

Answers

Autumn 2014 Math 125 Final Exam

1. (a) $\frac{2}{75}$
(b) $2 + \ln 2 - \frac{3\pi}{8}$
2. (a) $-\frac{\sqrt{x^2+4}}{4x} + C$
(b) $\ln|x^{1/4}| - \ln|x^{1/4}-2| - \frac{6}{x^{1/4}-2} + C$
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. $\frac{4\pi}{3}(R^2 - r^2)^{3/2}$
7. 1,112 ft-lb
8. (a) $\int_1^3 \sqrt{1+4x^2} dx$
(b) $\frac{1}{6}(\sqrt{5} + 4\sqrt{10} + 2\sqrt{17} + 4\sqrt{26} + \sqrt{37})$
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