

Answers

Spring 2012 Math 125 Final Exam

1. (a) $\frac{19}{54} \sin^{-1}(3x) - \frac{x}{18} \sqrt{1-9x^2} + C$
(b) $\frac{78}{5}$
2. (a) $4 - \sqrt{3}$
(b) $\sin x - \frac{1}{3} \sin^3 x + \frac{1}{3} \tan^3 x + \frac{1}{5} \tan^5 x + C$
3. $\frac{\pi}{4}$
4. (a) $\frac{\pi}{18} (7 + 4\sqrt{2} + 4\sqrt{5}) \approx 3.77$ miles
(b) $t \approx 1.81$ minutes
5. (a) $2\sqrt{3} - \frac{3}{2}$
(b) $b = \frac{2}{3}\sqrt{3} + \frac{1}{2}$
6. 1,275 ft-lb
7. $\frac{28\pi}{3}$
8. $\bar{x} = \frac{\pi}{2} - 1, \quad \bar{y} = \frac{3\pi}{8}$
9. $y = \frac{12}{4 - e^{15(x-1)}}$
10. (a) $\frac{dT}{dt} = k(T - 70)$
 $T = 70 + 110e^{kt}$ where $k = \frac{1}{20} \ln\left(\frac{9}{22}\right)$
(b) 14.88 minutes