

Answers

Spring 2010 Math 125 Final Exam

1. (a) $\frac{1}{3} \sec^3 x - \sec x + C$
 (b) $-2\sqrt{x} \cos(\sqrt{x}) + 2 \sin(\sqrt{x}) + C$
2. (a) $\frac{1}{3} \ln |\sqrt{x+1} - 1| + \ln(\sqrt{x+1} + 1) - \frac{4}{3} \ln(\sqrt{x+1} + 2) + C$
 (b) $\frac{\pi}{3} - \frac{\sqrt{3}}{2}$
3. (a) T (b) F (c) F (d) T (e) T (f) F
4. (a) $\frac{1}{3} \ln 4$
 (b) diverges
5. (a) $-\frac{3}{2}$
 (b) $\frac{31}{6}$
6. (b) $\frac{25\pi}{12}$
 (c) $\pi \int_{1/2}^3 \left(2 - \frac{1}{3}\right)^2 - \left(2 - \frac{1}{x}\right)^2 dx$ (using washers), or
 $2\pi \int_{1/3}^2 (2 - y) \left(\frac{1}{y} - \frac{1}{2}\right) dy$ (using shells)
7. (a) $\int_2^{10} 25 \cdot 2\sqrt{100 - y^2} dy$ ft³
 (b) $\int_2^{10} 25 \cdot 2\sqrt{100 - y^2} \cdot 45 \cdot (18 - y) dy$ ft-lb
8. $\bar{x} = -\frac{1}{2}, \quad \bar{y} = \frac{2}{5}$
9. $y = \frac{1}{1 - 2x}$
10. (a) $\frac{dg}{dt} = 0.01 - kg$
 (b) $g = \frac{0.01 - Ce^{-kt}}{k}$
 (c) 4.22 grams