

Answers

Spring 2011 Math 125 Final Exam

1. (a) $\sqrt{x^2 - 9} - 3 \sec^{-1} \left(\frac{x}{3} \right) + C$
(b) $-\frac{1}{3} \ln |\sqrt{x+4} + 1| - \ln |\sqrt{x+4} - 1| + \frac{4}{3} \ln |\sqrt{x+4} - 2| + C$
2. (a) $\frac{47}{60}$
(b) $\frac{3e^4 + 1}{2e^9}$
3. $\frac{\pi}{4} + \frac{1}{2} \ln 2$
4. $\frac{x}{\sqrt{(\ln x)^2 + 1}} + \frac{(\sin x) e^{2 \cos x}}{\sqrt{\cos^2(x) + 1}}$
5. $2 - \tan^{-1}(2) \approx 0.89285$
6. $2\pi \left(\frac{45}{2} + \frac{1}{2} \ln 2 + 2 \tan^{-1}(3) - 2 \tan^{-1}(2) \right) \approx 145.332$
7. $88,200 \pi$ joules
8. (a) $\int_1^3 \sqrt{1 + (1 + \sqrt{x})^2} dx$
(b) 5.200
9. $y = \sqrt{3 + 4e^{-x} - 4e^{-2x}}$
10. (a) $\frac{dv}{dt} = 9.8 - \frac{1}{5}v$
(b) $49(1 - e^{-t/5})$
(b) 49 meters/sec