Math 1151, Quiz #13, Fall 2014 Name KEY

Instructions: Show all work. Answers without work may only receive partial credit. If you are asked for an explanation, explain as completely as possible. Use exact answers unless specifically asked to round.

1. Evaluate the following definite integrals using the Fundamental Theorem of Calculus.

a. $\int_0^1 x + \sqrt{x}\,dx$ $= \int_0^1 x + x^{1/2}\,dx = \frac{1}{2}x^2 + \frac{2}{3}x^{3/2}\Big|_0^1 =$

$\frac{1}{2}(1)^2 + \frac{2}{3}(1)^{3/2} - \left[\frac{1}{2}(0)^2 + \frac{2}{3}(0)^{3/2}\right] = \frac{1}{2} + \frac{2}{3} = \frac{7}{6}$

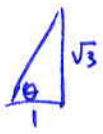
b. $\int_0^\pi 1 - \sin x\,dx$

$x + \cos x\Big|_0^\pi = \pi + \cos\pi - 0 - \cos(0) =$

$\pi + (-1) - (1) = \pi - 2$

c. $\int_1^{\sqrt{3}} \frac{dx}{1+x^2}$ $= \arctan x\Big|_1^{\sqrt{3}} = \tan^{-1}(\sqrt{3}) - \tan^{-1}(1) =$

$\frac{\pi}{3} - \frac{\pi}{4} = \frac{\pi}{12}$



2. Find the area between the curve of $f(x) = x^2 - 25$ and the x-axis on the interval [2,4]. Sketch the graph of the region.

$\int_2^4 x^2 - 25\,dx = \frac{x^3}{3} - 25x\Big|_2^4$

$= \frac{64}{3} - 100 - \frac{8}{3} + 50 =$

$\frac{56}{3} - 50 = \frac{56}{3} - \frac{150}{3} = -\frac{94}{3}$