Math 2250 HW #15

Due 1:25 PM Friday, December 2

Reading: Strogatz "It Slices, It Dices" (http://opinionator.blogs.nytimes.com/2010/04/18/it-slices-it-dices/), paying particular attention to Note 11; Hass §5.3–5.5

Problems: Do the assignment "HW15" on WebWork. In addition, write up solutions to the following problems and hand in your solutions in class on Friday.

1. Graph the function $f(x) = 1 + \sqrt{1 - x^2}$ and use some geometry (and *not* the Fundamental Theorem of Calculus) to compute the definite integral

$$\int_{-1}^{1} \left(1 + \sqrt{1 - x^2}\right) dx.$$

2. Using properties of the definite integral, show that if $f(x) \geq 0$ for all x in the interval $[a, b]$, then

$$\int_a^b f(x)dx \geq 0.$$

   In other words, the definite integral of a non-negative function is non-negative.

3. Compute the definite integral

$$\int_0^{\pi} \frac{1}{2} \left(\cos x + |\cos x|\right) dx.$$