Homework 2

Due January 20

Do the following problems from the textbook:

Section 5.1: 24

Section 5.2: 6a, 27, 34, 47, 51.

Appendix E: 12, 18, 20, 26, 30. Hint $1 + 2 + 3 + ... + n - 1 + n = n(n + 1)/2$.

And also do the following multipart problem:

a) Find the area under the curve $y = x$ from $x = 0$ to $x = 1$. Hint: triangle.

b) In class we showed that the area under the curve $y = x^2$ from $x = 0$ to $x = 1$ is _____.

c) In problem 5.1.24, you showed that the area under the curve $y = x^3$ from $x = 0$ to $x = 1$ is _____.

d) Using the online Riemann sums applet

http://www.slu.edu/classes/maymk/Applets/Riemann.html

what do you think is the area under the curve $y = x^4$ from $x = 0$ to $x = 1$?

e) What do you think is the area under the curve $y = x^n$ from $x = 0$ to $x = 1$?

E.C. Prove the following theorem: If $F(x)$ and $G(x)$ are any two antiderivatives of a function $f(x)$, then $G(x) = F(x) + C$ for some constant C. Hint: You need to show that the function $H(x) = G(x) - F(x)$ is constant. One way to do this is to show that $H(b) - H(a) = 0$ for any two numbers a and b. Apply the Mean Value Theorem to H in the form of (2) on page 285 in Stewart.