Test 1 Practice, Math 1410

•Test 1 covers the material from Section 2.2 to 3.1. There will be 8 to 10 questions on the test, and you will have the whole period to work on it.

•To study, you should read over your notes, try to re-work old HW and quiz problems, and work on other practice problems. Namely, you can look at the questions at the end of Chapter 2 and you can also try to work the recommended extra practice problems I posted to blackboard. You can also find some resources online to get practice questions- for example, the website

http://www.math.ucdavis.edu/ hass/Calculus/Exams/exams.html

has a sample midterm 1 that you can use to practice (it also has the midterm with solutions so you can check your answers). They cover more material than we do, though, so the only applicable problems on the sample midterm are numbers 2, 3, 4, 7 and 9 (for number 7, just draw a picture).

•You can use a calculator, but you will not need one. Using the calculator might be useful for confirming an answer is correct, but you will still need to show your work to get full credit.

•Some problems to work on in class today:

1) A particle moves along a horizontal line so that after t seconds its position is given by

$$s(t) = \frac{5}{3}t^3 - 10t^2 + 15t$$

When is the particle moving left? Note: positive direction is to the right, so increasing = moving right. (Also, you should use the derivative rules to solve this question, you do not have to use the definition of the derivative).

2) Sketch the graph of the continuous function $f(x)$ on $[-3, 3]$ that satisfies:

$f(1) = -2, f(-1) = 0$

$f'(1) = 0$, and $f'(-2)$ does not exist.

$f'(x) > 0$ on the intervals (-3, -2) and (1,3).

$f'(x) < 0$ on (-2,1)

$f''(x) > 0$ on (-3, -2) and (-2,3)

3) True of False: If true, explain why it is true, if false give a counterexample or explain why it is false.

(i) If $x = 1$ is a vertical asymptote of $y = f(x)$, then f is undefined at $x = 1$.

(ii)

$$\lim_{x\to 1} \frac{x^2 + 6x - 7}{x^2 + 5x - 6} = \frac{\lim_{x\to 1} x^2 + 6x - 7}{\lim_{x\to 1} x^2 + 5x - 6}$$

4) Sketch a graph of $f'(x)$ if $f(x)$ is the graph given below:

5) Use the limit definition of the derivative to calculate $\frac{d}{dx}(\sqrt{x-7})$.

6) Find a value for c such that the limit exists:

$$\lim_{x\to 3} \frac{x^2 - 7x + c}{x - 3}$$