

**ONLY SCIENTIFIC CALCULATORS ALLOWED**

**Test 2** is Friday, October 25. It covers Sections 2.6, 2.7, 3.1-3.7, and 4.1-4.4. It will be 5 pages, about 20 points per page.

2.6 was implicit differentiation. A typical problem is to find a tangent line.

2.7 was related rates. Those can be hard. Do as many problems from your textbook as you can.

2.8 is not on your test.

In Chapter 3, you should know exponential and log functions pretty well. You should know their limits, properties, and derivatives. (This is 3.1, 3.2, 3.3.)

3.4 was on exponential growth and decay. The main formula you need to know is  $y(t) = y(0)e^{rt}$ . For decay problems  $r < 0$ , for growth problems  $r > 0$ . Given a data point  $(t, y(t))$  you should be able to find  $r$ . Given  $r$  you should be able to find the half-life (decay) or the doubling-time (growth) or the time when  $y(t)$  is some specified value.

If you need to use Newton's Law of Cooling, I'll give you the formula.

3.5: Know derivatives of  $\arctan x$ ,  $\arcsin x$  and  $\arccos x$  and be able to derive these. Know basic properties of these functions, like their domains, limits, values at 0.

3.6: Know definitions of  $\sinh x$ , etc. Know derivatives of  $\sinh x$ ,  $\cosh x$  and  $\tanh x$ .

3.7: Be able to use L'Hospital's Rule, but also know when not to use it!

Chapter 4. 4.1-4.4. You will need to be able to graph a function and find extrema using derivatives. You should be able to find where a function is increasing or decreasing. You should be able to find inflection points and identify where a function is concave up or down.

You should be studying for this test now. Do not wait until the night before. College is not like high school.