Math F200: Second Midterm Study Ideas **October 17, 2005**

This list is intended as the start of a study guide. There is no guarantee that because a topic is listed here that it will be on the midterm, nor is there a guarantee that every problem on the midterm is represented in the list below. I've broken down the topics into three categories: problem solving, tasks, and basic computations. You can expect to find all of these categories represented on the midterm. The midterm will cover Chapter 2 sections 8 and 9 and Chapter 3 sections 1, 2, 4, 5, 6, 7, and 8. Although we did not cover section 3.3 explicitly in class, you should know how the derivative relates to rates of change as we have discussed in class and as you have seen on quiz and homework problems.

Problem Solving and the Big Picture

- Solve word problems involving rates of change.
- Use the relationship between rates of change and slopes of tangent lines to interpret graphs.
- Given a function describing a physical quantity (e.g. temperature as a function of time, or density as a function of temperature) be able to interpret the meaning of the derivative as a rate of change.
- Understand the relationship between positions, velocities and accelerations. Be able to solve word problems involving these quantities.

Tasks:

- Compute instantaneous rates of change.
- Compute slopes of tangents lines of functions.
- Determine the tangent line at a point on a graph or an implicitly defined curve.
- Use logarithmic differentiation to simplify the computation of a derivative.
- Find the derivative of an inverse function.
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Computations:

- Be able to use the constant multiple, sum, product, power, and quotient rule.
- Be able to use the chain rule.
- Find an implicit first or second derivative.
- Know derivatives of exponential, trig, inverse trig, and logarithmic functions.
- Demonstrate mastery of review material (including limits).