Math 2010: Study Sheet for Test 2

The purpose of this handout is to help you study by listing the concepts, definitions, and results you will need to know for the second test.

Test Information. The second test will be on Thursday, November 6, 2003 from 5:30 - 7:00 in **UC 2011** (the Upper Lecture Theater). You will **not** be allowed to bring in any notes, use the text book, or use a calculator. If a question involves a calculation you may leave it in an unexpanded form, e.g., you can write 5^4 instead of 625, or $\sqrt{10}$ instead of $3.1\ldots$.

Test Procedure. Please show up on time on the day of the test so that we may start on time. Please, **bring you Student ID card**. Before the test starts, all bags, coats, and other belongings must be moved to the front of the room. They may be picked up at the end of the test. During the first 30 minutes, nobody will be able to leave the exam room.

Material Covered. The test will cover all the material discussed in class about Sections 3.8 - 3.12 of Chapter 3 and Sections 4.1 - 4.5 of Chapter 4. I have provided a breakdown of what you will need to know below.

1. Section 3.8 Know how to differentiate equations implicitly.
2. Section 3.9 Know the derivatives of all the trigonometric functions.
3. Section 3.10 Know how to differentiate functions of the form $e^u, \ln u, a^u$, and $\log_a u$.
4. Section 3.11 Know how to use logarithmic differentiation.
5. Section 3.12 Know the statement of the Mean Value Theorem (and Rolle's Theorem), and know when the theorem can be applied. You should also be able to do problems like we did in class and in the homework.
6. Section 4.1 You should know how Newton's Method works, and how to set up the iterative equation. You will not have to calculate any roots.
7. Section 4.2 Know what is meant when we say a function is increasing or decreasing. Also, you should be able to use the derivative to determine when a function is increasing and decreasing.
8. Section 4.3 Know what a critical point is, and how to find critical points. Also know what local maximums and local minimums are. Be able to use the first derivative test for determining local maximums and minimums.
9. Section 4.4 Know what is meant by the terms concave up and concave down. Know how to use the second derivative to determine concavity on an interval, and how to use the second derivative for determining local maximums and minimums.
10. Section 4.5 Given a function, you should be able to sketch a graph that highlights some of the important features (local mins and maxs, inflection points, etc.)

Note 1. Although there is no homework assignment on Sections 4.4-4.5, this material is important. For practice, you should try

Section 4.4 7, 11, 13

Section 4.5 5, 9, 27

Up to two questions from this list will appear on the test.