Calculus I: Exam 1 Information
Winter 2004

For the exam, you are responsible for the material in sections 1.1, 1.2, 1.3 (we covered this material using the computer lab), 2.1, 2.2, 2.3, 2.5, 2.6, and 3.1.

Most of the exercises on the exam will be very similar to things that you had to do on the homework. You should also be able to do each of the following:

- Define what it means for a function $f(x)$ to be continuous at a point $x = a$. In addition, any time that you are asked to determine whether or not a function is continuous at a particular point, you should be able to show that each of the three conditions in this definition are satisfied or else clearly explain which one(s) fail.

- State the definition of the derivative of a function $f$ and explain in detail why it is defined in this way. So you should be able to explain in great detail where the specific formula $\lim_{h \to 0} \frac{f(x+h) - f(x)}{h}$ comes from and what it means.

- State the squeeze theorem and use it to compute a limit (like exercises 33, 34 from section 2.3 or exercises 17 and 18 from the chapter 2 review exercises)

- State the intermediate value theorem and use it to prove that a given equation has at least one root (like exercises 42-52 from section 2.5)

- Given a graph of a function, you should be able to determine:
  - limits of the function (like exercises 4-10 in section 2.2 and 2 in section 2.3)
  - where the function is continuous (like exercises 3-4 in section 2.5)
  At any point at which a function does not have a limit or is not continuous, you should be able to give a clear, concise explanation of why these things fail.

- If you are asked to compute a derivative, a slope of a tangent line, or an instantaneous velocity, then you MUST use the limit methods of sections 2.6 and 3.1 or you will receive NO credit for the problem. (i.e., using formulas for derivatives that we have not yet covered in this class is not permitted.)

Finally, each chapter in the book ends with a three part chapter review, which consists of a concept check, a true-false quiz, and some review exercises (p. 55-57 for chapter 1 and p. 121-123 for chapter 2). All three parts are very valuable for your test preparation. (Note, however, that we skipped section 2.4, so you should skip question 13 from the Ch. 2 true/false quiz and #19-22 and #33 from the Ch. 2 review exercises, as these relate to material from that section. Other than that, you should be able to handle all questions from the Ch. 1 & 2 reviews.)

This list is not intended to be a complete list of what will be on the exam. You are responsible for all of the material in the sections listed and should be able to do all of the homework exercises from those sections.