Mathematics 242 – Principles of Analysis
Information on Exam 2
November 8, 2000

General Information

The second exam for the course will be given in class on Friday, November 17. This will be an individual, in-class, closed book exam. I will be happy to hold a late afternoon or evening review session to help you prepare. Scheduling is going to be rather difficult, though: I have commitments (the Holy Cross Chamber Orchestra concert, and another orchestra rehearsal) in the evening both Wednesday and Thursday, November 15 and 16. It may be that the only possible times for a review session turn out to be Tuesday evening or late Wednesday afternoon.

Topics to be Covered

The exam will cover the material we have covered since the first exam up to and including class on November 10 (the Fundamental Theorem of Calculus). This is material from Chapters 3, 4, 5 of the text (but only the sections we covered in class – not 3.6, 4.4, or 5.5):

1) Limits of functions, the limit theorems (sum, product, quotient, "squeeze" rules, one-sided limits
2) Continuity
3) Definition and properties of the derivative, the Mean Value Theorem
4) The definite integral, integrability, the Fundamental Theorem of Calculus

What to Expect

The exam will have four or five questions, each possibly with several parts. Some questions will ask for a precise statement of a definition or a theorem we have discussed. Be prepared to give careful statements of

1) The definitions of $\lim_{x\to c} f(x) = L$ and f is continuous at c
2) The Intermediate and Extreme Value Theorems
3) The Mean Value Theorem
4) The Fundamental Theorem of Calculus

Also know and be able to give proofs of:

1) Statements of the form $\lim_{x\to c} f(x) = L$ using the definition
2) The Extreme Value Theorem
3) The Mean Value Theorem (proof via the special case $f(a) = f(b)$ – Rolle's Theorem)

The other questions will be similar to questions from the problem sets and discussions. Some good review problems to look at are

Section 3.1/2, 7, 9
Section 3.3/1, 5, 8
Section 3.4/1, 9, 10
Section 3.5/9, 15, 20
Section 4.1/10, 11, 12, 13
Section 4.3/10, 14, 19, 21
Section 5.1/ 3, 9,
Section 5.3/2, 4, 5
Section 5.4/3, 4, 8