Math Xa
Reviewing for Midterm I

Fall 2003

Topics

Midterm I will cover the first four chapters in *Calculus: An Integrated Approach to Functions and Their Rates of Change*. More specifically, you will be responsible for the following topics.

- To understand and be able to apply the concept of function.
- To understand and be able to use functional notation.
- To be able to represent and interpret functions numerically, algebraically, graphically, and verbally.
- To understand and be able to apply different properties and characteristics of a function such as continuity, and monotinicity (increasing and decreasing).
- To begin to build a small repertoire of functions, including linear functions, the absolute value function, and the square function.
- To understand and be able to apply the information about a function given by its graph.
- To understand and be able to use the algebra of functions. That is, the addition, subtraction, multiplication, and division of functions to obtain new functions.
- To understand and be able to apply the concept of composition of functions.
- To understand and be able to apply the definition of inverse functions.

- To be able to decompose a complicated function into the composition of two more easily understood functions.
- To understand and be able to apply the connection between basic algebraic transformations of a function and what happens to the graph of the function. That is, you should know about shifting, stretching, shrinking, and reflecting functions.
- To understand the concept of local linearity. Locally, any curve looks like a straight line.
- To understand and be able to apply the concept of a linear function.
- To understand the slope of a linear function as a rate of change.
- To be able to apply the concept of a linear function to modeling situations.

Suggested Exercises

- Section 1.2. Exercises 14, 16, 17; pp. 10-15.
- Section 1.3. Exercises 8, 13, 29, 43, 55; pp. 34-47.
- Section 2.1. Exercises 7, 8, 9; pp. 58-61.
- Section 2.2. Exercises 11, 12; pp. 70-73.
- Section 2.3. Exercises 13, 14; pp. 77-81.
- Section 2.4. Exercise 14; pp. 89-94.
- Section 3.1. Exercises 8, 10; pp. 105-108.
- Section 3.2. Exercises 5–10, 19, 20; pp. 113-119.
- Section 3.3. Exercises 10–17; pp. 121-122.
- Section 3.4. Exercises 5, 12, 16; pp. 133-138.
- Section 4.2. Exercises 4–13; pp. 151-153.
- Section 4.3. Exercises 2, 8; pp. 155-157.
- Section 4.4. Exercises 1, 2, 5; pp. 164-168.