The second test will be on Thursday, March 18, 2004. It seems as if we just had a test, but recall, we started
this material a week before test #1, so we’ve been working on this material for a good (or bad) five weeks.

Below, I reiterate once again some of the comments made last semester prior to the first test: “Typically, a
test consists of four types of questions . . . ”

1. **Definitions.**
   In mathematics, it is important to know the *exact* meaning of the terms used. An exact knowledge of
   the definitions is essential for successful problem solving. (Don’t forget about any Axioms.)

2. **Statements of Theorems, and short responses.**
   Typically, theorems with names are asked of the student. Review the material and make sure you know
   the statements of all these theorems. The short response will quiz you own your knowledge of the
   anonymous theorems.

3. **Proofs of theorems.**
   At this level, fairly simple theorems, ones with short proof will be asked. See comments below.

4. **Problems.**
   (a) Problems you’ve seen before
   Review all the problems we have worked so far.
   (b) Problems you haven’t seen before.
   Don’t worry about these, just prepare for that part of the test you can; rely on your understanding
   of the material, your experience, and your wits for this part.

**Note:** Some question types may not appear.

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**Comments on the Material**

The test will cover §§6.3–6.5 and §7.1 of the text, plus any addition material introduced in class¹.

- **Chapter 6.** It goes without saying² that you should review the various definitions, theorems and
  problems of §§6.3–6.6.
  - §6.3 covers the **First Fundamental Theorem**, which is the main way we compute the value of a
    definite integral. You should certainly know the (statement and) proof of **Theorem 6.9**.
  - §6.4 discusses the convergence of Darboux and Riemann sums. You should know the proofs of
    Corollary 6.12, Theorem 6.13 (trivial), and Theorem 6.16.
  - §6.5 discusses the well-known properties of the integral: linearity, monotonicity and additivity.
    These properties, which are inherited from summation, are pretty easy to proof using the **Riemann
    Sum Convergence Theorem**, Theorem 6.16. Please review the proofs of Theorems 6.17, 6.18
    and 6.19. Recall that I also introduced another theorem in class concerning the composition of a
    Riemann integrable function with a continuous function (the proof is not required).

- **Chapter 7.** It goes without saying³ that you should review the various definitions, theorems and
  problems of §7.1.
  - §7.1 concerns the **Second Fundamental Theorem of Calculus**, which states the existence of
    an antiderivative⁴ of a continuous function. You should know the proofs of **The Mean Value
    Theorem for Integrals** and **The Second Fundamental Theorem of Calculus**, which uses
    Proposition 7.2 (proof not required).

Seems as if we haven’t covered many topics. Maybe we can speed it up a bit with §96.1 and beyond! :–)

Good luck ☻

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¹ Additional material on the Riemann-Stieltjes Integral was also introduced.
² :–)
³ :–)
⁴ A term not used in this text, but is a standard term used in undergraduate Calculus texts.