Review for the Second Exam

1. Know the statements and proofs of the following theorems and be able to reproduce these statements from memory.

   a. Theorem 3.7 Monotone Convergence Theorem

   b. Theorem 3.8 Nested Intervals Theorem

   c. Theorem 3.9 Monotone Subsequence Theorem

   d. Theorem 3.10 Bolzano-Weierstrass Theorem for Sequences

   e. Theorem 4.3 Intermediate Value Theorem

2. Know every definition, notation and terminology up to and including section 4.4

3. Know the proofs of

   a. Proposition 3.5 A convergent sequence is Cauchy.

   b. Lemma 3.3 A Cauchy sequence is bounded.

   c. Theorem 3.12 If a sequence in $\mathbf{R}$ is Cauchy then it converges.

   d. Lemma 4.1

   e. Propositions 4.4, 4.5 and 4.8

   f. Theorems 4.2 and 4.3

   g. Corollary 4.3

4. Be able to establish the limits §3.2#1a–f, §3.7#1a–f and §3.8#1a–f.

5. Be able to show

   a. The sum of two continuous functions is continuous.

   b. The product of two continuous functions is continuous.

6. Have an example for all assigned homework problems from sections 3.1 through 4.4 which say "give an example" and also homework problem §4.4#1a–b.

7. There will be one or two problems not on this list.