

## Review for Second Exam

The second exam (Friday, June 22) will cover the material we worked on in Assignments 8 through 12. This is the material from sections 3.3, 3.4, 3.7, 4.1, and 4.2, but it also requires knowing what's in sections 3.1 and 3.2, and problems like those at the end of section 3.2 could also appear on the exam.

**3.3. Monotone sequences.** This whole section is worth reviewing in detail. Notice that the treatment given for the convergence of  $(1 + 1/n)^n$  in Example 3.3.6 is quite different from the one I gave in class. In class I gave an argument that does not use the binomial theorem, but uses Bernoulli's inequality instead.

**3.4. Subsequences and the Bolzano-Weierstrass theorem.** You should review this section from the beginning through Example 3.4.6. You can skip the Monotone Subsequence Theorem 3.4.7, and the material on limit superior and limit inferior on pages 82 to 83, which we do not cover in this class.

Section 3.5, on Cauchy sequences and the Cauchy criterion, will not be covered on the exam.

**3.7. Introduction to infinite series.** We covered this section from the beginning through Example 3.7.6(c). You should also review the Comparison Test, Theorem 3.7.7. You do not need to know the remainder of the material in this section.

**4.1. Limits of functions.** We have covered all the material in this section; however, we have not gone through examples like those in Examples 4.1.7(c,d,e) on pages 106 to 107. We haven't needed to do this because the limits in these examples can all be proved more easily using the sequential criterion (Theorem 4.1.8), as explained in class. You won't be asked to do examples like those in Examples 4.1.7(c,d,e) on the exam.

**4.2. Limit theorems.** This exam will only cover the material in this section up through the examples in 4.2.5. Notice that these examples use Theorem 4.2.4, and this theorem is easy to remember (and to prove) because it follows immediately from the theorem on sums and products of sequences (Theorem 3.2.3) and the sequential criterion.