Review for Second Exam

The second exam will cover sections 3.2, 3.3, 3.4, 3.5, 4.1, and 4.2 of the text. (The relevant assignments are assignments 7 through 18.)

As on the first test, there will be one or two questions in which I ask you to state a definition or to prove a theorem, taken from the following list.

- Be able to prove that if (x_n) is a monotone increasing sequence, then (x_n) converges (3.3.2a).
- Definition of subsequence (3.4.1).
- Be able to prove that if a sequence converges to x, then each of its subsequences also converges to x (3.4.2).
- Definition of Cauchy sequence (3.5.2).
- Be able to prove that if a sequence converges, then it is Cauchy (3.5.3).
- Definition of cluster point of a set (4.1.1).
- Definition of limit of a function at a point (4.1.4).

Here is a guide to the sections in the text that will be covered by the problems on the exam.

- Section 3.2: you should read the whole section. We didn't prove Theorem 3.2.10 in class, but its proof still makes for instructive reading. You can skip Theorem 3.2.11 if you like.
- Section 3.3: You should read the whole section carefully. Notice, though, that the proof I gave in class for the convergence of $(1+1/n)^n$ was quite different from the one given in the text.
- Section 3.4: Read from the beginning of the section through Example 3.4.6 (you can skip Example 3.4.6(c) if you like). Although I won't ask you to prove the Bolzano-Weierstrass theorem, I recommend you re-read its proof. The proof I gave in class is similar the the "Second Proof" given in the text; you can skip the "First Proof", and also you can skip Theorem 3.4.7, which is only used as preparation for the "First Proof". You can also skip Theorem 3.4.9.
- Section 3.5: Read from the beginning of the section through the proof of Theorem 3.5.5. You could also take a look at Examples 3.5.6(b) and 3.5.6(c) (the example I gave in class is related to these). You can skip the remainder of the section.
- Sections 3.6 and 3.7 are not covered on the exam.
- Sections 4.1 and 4.2: read the entire sections.