Homework

due on Wednesday, April 27

Read carefully sections 10.1-10.4 in the book. Solve the following problems (some of the problems require material which will be introduced on Tuesday).

Problem 1. Prove from the definition that $\lim_{n\to\infty} \frac{1}{\sqrt{n}} = 0$.

Problem 2. Let $a_n \ge 0$ for all n and $\lim_{n\to\infty} a_n = A$.

- a) Prove that $A \ge 0$.
- b) Prove that $\lim_{n\to\infty} \sqrt{a_n} = \sqrt{A}$. Hint: $\sqrt{x} \sqrt{y} = (x-y)/(\sqrt{x} + \sqrt{y})$.

Problem 3. Prove that $\lim_{n\to\infty} \sqrt[n]{1+2^n} = 2$. Hint. Prove that $\sqrt[n]{1+2^n} - 2 < 2(\sqrt[n]{2}-1)$.