21-235 Analysis Assignment 1

Problems due Friday, September 3:

1.1-4 From Pugh p. 41: Turn in polished solutions for problems 10, 12, 42, and 36a. Also, solve problems 3, 5, 15, 17 and 32.

1.5 (Compare carefully Pugh's problem #14. Take the result of #15 for granted.) Let x be a positive real number and $n \in \mathbb{N}$. Given any $\varepsilon > 0$, prove there exists $\delta > 0$ such that, if $y > 0$ and $|x - y| < \delta$ then $|\sqrt[n]{y} - \sqrt[n]{x}| < \varepsilon$.

Homework policies and suggestions — analysis
Late homework. Problems are due at the beginning of class. Homework that is not turned in before solutions are provided (typically 2-3 class periods later) cannot be graded, in general. In special circumstances contact the instructor.
The lowest homework grade will be dropped at the end of the semester.

Writing mathematics well:

- Make your response self-contained. State assumptions, explain notation, describe the goal, and indicate the strategy — whether the proof uses induction, contradiction, or contraposition, say. Note that written mathematics consists of complete sentences conforming to English grammar!

- Identify your audience. Effective communication is aimed at a target audience. You want to include enough detail to convince the instructor that you understand the material, but not bore with trivial detail (unless it's essential for the point of the problem, ugh). It's tricky to find the right balance. One way to target your writing is is to aim at a student in class a week ago, say, who hasn't seen this problem.

- Aim at clarity — don't turn in a first draft. Mathematics is difficult enough. Reduce the burden on your reader by reading your first draft critically and revising it. My method of writing research papers is: 1. Write. 2. Read. 3. Tear up. 4. Repeat until clear (usually at least 5 times, unfortunately).

You may find interesting the handout on induction ("logical chain reaction") on the web page.