for Wednesday, September 3

1. Read the syllabus for the course (available on the website), then read the following parts of the textbook: Appendix A.1, the preface, and the short introduction to Chapter 1.
2. Turn in a carefully written solution to the following problem:

   Prove that $\sum_{i=1}^{n}(-1)^{i+1}i^2 = \frac{1}{2}(-1)^{n+1}n(n+1)$ for each positive integer n.

   You should use mathematical induction for your proof. I ask that you work alone on this problem (getting no help from any source other than the textbook or your Math 260 notes) so that I can get a sense of your level of preparation for solving problems and writing proofs.

for Friday, September 5

1. Read Section 1.1. Except for the last part of this section, the material should read rather quickly. (If you have not yet taken abstract algebra, then you may skim the discussion of fields.) Start now to really learn what it means to read and understand a mathematics textbook as you will be doing quite a bit of this over the next four months.
2. Do exercises 7, 10, 12 (use Exercise 11), 14, and 15 in Section 1.1. Many of the solutions to these exercises involve proof by contradiction.
3. Turn in a carefully written solution for exercise 15. Be certain to include a (perhaps abbreviated) statement of the exercise and to use words and complete sentences in your proof.

for Monday, September 8

1. Read Section 1.2 through the discussion of geometric sums.
2. Do exercises 6, 7, 9, 12, and 17 in Section 1.2. Note carefully that Exercise 12 can be used to help solve Exercise 17. The fact that previous results can often be used to simplify the proofs of later results is an important observation; keep this in mind as you do later assignments.
3. Turn in a solution for exercise 7; think carefully about how you approach this problem.

for Wednesday, September 10

1. Read Section 1.3 through the paragraph following the proof of Theorem 1.18. The Completeness Axiom and the Archimedean Property are extremely important so be certain to ask questions if you find anything confusing about them.
2. Do exercises 12, 15, 17, 19, and 20 in Section 1.3.
3. Turn in a solution for exercise 15; you may use Theorem 1.17 in your solution.

for Friday, September 12

1. Read Section 1.4, focusing primarily on the proof of Theorem 1.29 since it gives a different proof that the set of real numbers is uncountable than the one you have most likely seen. Note the use of the Completeness Axiom. Hopefully, much of the rest of the material in this section is familiar to you from Math 260 or previous math courses.

2. Do exercises 4, 9, and 17 in Section 1.4.

3. Skim Section 1.5. Much of this material should be familiar to you but be certain that you know the vocabulary. Think carefully about and ponder the implications of the rather bizarre functions we discussed in class. It is important to realize that functions can behave in strange and unexpected ways so definitions of properties (such as continuity) must be stated very carefully.

4. Do exercises 23, 24, 25, 27, 34, 35, and 43 in Section 1.5. Be prepared to discuss these exercises in class.

for Monday, September 15

1. Read Section 2.1 through the proof of Theorem 2.4. Become very familiar with the adjectives for sequences, being able to state their definitions and give examples of sequences with or without a given property. This will most likely be your first introduction to proofs that involve "Let $\epsilon > 0$ be given" so study the examples in the textbook and your notes carefully.

2. Do exercises 5, 7, 9, 10, 11, and 15 in Section 2.1. For exercises that ask for examples, try to find several different sequences with each property. Be prepared to share your examples in class as well as outline your solutions to the exercises that require proofs.

3. Turn in a solution to the following problem: use the definition of convergence to prove that the sequence $\left\{\dfrac{3n+11}{4n+7}\right\}$ converges. Try to keep your computations as simple as possible.