**MATH 2610**
**Discrete Mathematics for Computer Science**
**Exam I review**

We will be having our first examination Thursday February 10, 2005. This exam will cover material from chapter 1, including the stuff on cardinality of infinite sets which we covered in class. Below is a selection of problems that is intended to be a review of the material you can expect on the exam. Although I have not written the exam, I expect that if you have no difficulty with the problems below, then you should do fine. There will be no homework assigned this week so that you can use the time to study. Next week I will be happy to spend class time answering questions about the exam and working examples. But in order for me to do this, you need to have some questions or know which examples you would like to see worked. If there are no questions, then I will need to cover new material.

I. Exercises 1,2,4-7,10,11,12a-c,13a-c,14-19,25-31, 71 in the book pages 108-111.

II. Prove that if $A$ is a set, $|A| = |\mathbb{Z}^+|$ and $a \in A$, then $|A - \{a\}| = |\mathbb{Z}^+|$.

III. Prove that the set of irrational numbers in between 0 and 1 is uncountable. Hint: Coming up with a bijection may be tricky. What happens if you assume the set of irrational numbers between 0 and 1 is *countable*? Don't forget, you know (0,1) is uncountable and if $x \in (0, 1)$, then $x$ is either rational or irrational.