Math 510, Fall 2015
Assignment 1, due Friday, August 28

Hand in solutions to the following problems:

1. Rudin, Chapter 1, # 5
2. Rudin, Chapter 1, # 6
3. Rudin, Chapter 1, # 8
4. Rudin, Chapter 1, # 9
5. Let $x, y \in \mathbb{R}$ be such that $x \leq y + \epsilon$ for every $\epsilon > 0$. Show that $x \leq y$.
6. Suppose $A \subset \mathbb{R}$ is a set which is bounded from above and below. Prove that

$$\sup A - \inf A = \sup\{|a_1 - a_2| : a_1, a_2 \in A\} = \sup\{a_1 - a_2 : a_1, a_2 \in A\}.$$

On your own (some may be assigned next week): Rudin, Chapter 1: 1,3,7,13,15 and the following problem:

Suppose $a, b, c, d \in \mathbb{R}$ and that $a \leq b \leq c \leq d$. Show that $c - b \leq d - a$. (This is not hard, but this principle comes up *frequently*, so it is worth your while to be highly familiar with it)

Reading: Rudin, Chapter 1