Math 181 Recitation 5

Due at recitation, Thurs, Sep. 20, 2007

This week there will be no homework other than this one. Use the extra time to prove to yourself that you should be in an honors class, by doing whatever is needed to understand this week's class notes. If you can't figure something out, ASK IN CLASS. (It's likely that someone else doesn't understand either, and they'll be grateful that you raised the matter.)

- **1.** Prove (carefully) that if R is an open right half-line, then -R is an open left half-line.
- **2.** Prove that for any sets S, S_1 and S_2 ,

$$S \cup (S_1 \cap S_2) = (S \cup S_1) \cap (S \cup S_2).$$

3. Write down a definition for the term "greatest lower bound" (GLB). (Just look at the definiton of LUB and use your imagination.) Assuming the LUB axiom, *prove* that any nonempty bounded-below set S of real numbers has a GLB.

<u>Hint</u>. Make use of an LUB of the set -S.

4. Let a < b be real numbers. What is the LUB of the closed interval [a, b]? What is the GLB of the open interval (a, b)?

Justify your answers completely—that is, show that your answer satisfies the defining properties of an LUB (respectively, GLB).