Homework due on Friday, April 8

Read carefully chapters 8 and 9 in the book. Solve the following problems.

Problem 1. Prove that if a < b then b is the least upper bound of the interval [a, b)

Problem 2. Consider the field $i\mathbb{Q}$ of rational numbers. Let A be the set of all positive rational numbers a such that $a^2 > 3$. Prove that the largest lower bound for A does not exist in the field of rational numbers (we did similar proof in class).

Problem 3. Let A, B be two sets and let a, b be the least upper bounds of A and B respectively. Prove that the least upper bound of $A \cup B$ is the larger of a and b. Show that both a and b are upper bounds for $A \cap B$. Show by example that the least upper bound for $A \cap B$ does not have to be equal to the smaller of a and b.