

Assignment 1, Math 4820\5820
Due Wednesday, August 31

1. Show that there does not exist a rational number r so that $r^2 = 6$.
2. Suppose that S is an ordered set (with order " $<$ ") and $E \subseteq S$ is a non empty subset. Suppose further that α is a lower bound of E and β is an upper bound of E . Show that $\alpha \leq \beta$.
3. Suppose that A is a non empty subset of real numbers. Define $B = \{2x : x \in A\}$ and $C = \{-x : x \in A\}$. Show that
 - (a) $\inf B = 2 \inf A$
 - (b) $\inf A = -\sup C$

Remark: In question 3 a), the understanding is that if $\inf A$ exists then $\inf B$ exists and the equality holds and conversely if $\inf B$ exists then $\inf A$ exists. Question 3 b) is similar.