

The University of Waikato
Department of Mathematics

Elements of Analysis math252-09B 2009 Assignment 1

Due Wednesday 22nd July: Please hand back your completed assignment through the slot for this paper outside the Mathematics Office G3.19.

It should be written up neatly and on no more than four sides of an A4 page or the equivalent.

1. Find all of the real numbers x such that

$$x + 1 < |x - 1|.$$

2. Prove that if $a < b < 0$ then inversion reverses the order i.e.

$$\frac{1}{b} < \frac{1}{a}.$$

3. Let the subset $S \subset \mathbb{R}$ be given by $S = (2, 4] \cup \{5\}$. Prove that

$$\text{glb } S = 2 \text{ and } \text{lub } S = 5.$$

4. Let A and B be non-empty subsets of \mathbb{R} with $A \subset B$ and suppose that B is bounded above. Prove that $\text{lub } A \leq \text{lub } B$.

Kevin Broughan
14th July 2009