Homework 1

Week 1

October 18, 2024

1. (25 points) Show that $\left|\dfrac{1}{a}\right| = \dfrac{1}{|a|}$, if $a \neq 0$

2. (25 points) Let $a, b \in \mathbb{R}$ and $b \geq 0$, prove that $|a| \geq b$ if and only if $a \leq -b$ or $a \geq b$.

3. (25 points) Let $A \subseteq \mathbb{R}$ finite and non-empty. What is $sup\,A$ and $inf\,A$? Justify.

4. (25 points) Let A be a nonempty set which is bounded below. Let $B := \{b \in \mathbb{R} : b$ is a lower bound for A $\}$. Show that $sup\,B = inf\,A$.