MATH 502A **Zachary Peskin**
Prof. Soto Date: January 27, 2021

Assignment 1

STATEMENT #1:

Let $a, b \in \mathbb{R}$. Show that $\mid b \mid \leq a$ if and only if $-a \leq b \leq a$.

Proof. ($\Rightarrow$): Suppose $\mid b \mid \leq a$

$$\mid b \mid \leq a \Rightarrow b \leq a \cap b \geq -a$$

Expressing the intersection as one inequality

$$\Rightarrow -a \leq b \leq a$$

($\Leftarrow$): Suppose $-a \leq b \leq a$

$$\Rightarrow -a - b \leq 0 \leq a - b \Rightarrow -a - b \leq 0 \cap a - b \geq 0$$

$$\Rightarrow -a \leq b \cap a \geq b \Rightarrow b \leq a \cap b \geq -a$$

Which is equal to $\mid b \mid \leq a$

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