

Completeness Worksheet

Thomas R. Cameron

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1 Exercises

- I. Let $S \subseteq \mathbb{R}$ be non-empty. Prove that if S is bounded below, then $\inf S$ exists in $\mathbb{R}$. Hint: Define $T = \{-s : s \in S\}$ and apply Theorem 1.1 to T .
- II. Prove the Archimedean property of the reals: The natural numbers are unbounded above in $\mathbb{R}$. Hint: Use Theorem 1.1 and proof by contradiction.