MATH 131 Homework 3
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1. **Let** $a, b \in R$**. Show if** $a \leq b_1$ **for every** $b_1 > b$**, then** $a \leq b$**.**

2. **Prove that for any** $A, B \subset \mathbb{R} : \sup(A \cup B) = \max\{\sup(A), \sup(B)\}$**.**
   Note that $\sup(A) \leq \sup(A \cup B)$ and $\sup(B) \leq \sup(A \cup B)$.
   WLOG Suppose $\sup(A) > \sup(B)$ and $\sup(A \cup B) \neq \sup(A)$ then

3. **Determine if** $\lim_{n \to \inf}$