# Math 327 Homework 1

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1. Let $x$ and $y$ be two positive numbers.

   (i) Use the mathematical induction to show that if $x < y$, then $x^n < y^n$ for all n $\in \mathbb{N}$.

   (ii) Deduce that if $x^n < y^n$ for some $n \in \mathbb{N}$, then $x < y$.

2. Do problem 17 on page 11 of the textbook [F]

3. Suppose that $S$ is a non-empty set of real numbers that is bounded. Prove that inf $S \leq$ sup $S$, and the quality holds if and only if $S$ consists of exactly one number.

4. Do Problem 10 on page 11 of the textbook [F].