Homework 1: Bounded Sets, Infimums, Supremums

*Assignments should be **stapled** and written clearly and legibly.*

1. §3.3, # 3(a), (d), (f), (h), (l), 5, 8.
2. Suppose that A and B are two nonempty sets of real numbers such that $x \leq y$ for all x in A and y in B.
   (a) Explain why A is bounded above and B is bounded below.
   (b) Explain how we know that both $\sup A$ and $\inf B$ must exist.
   (c) **Prove** that $\sup A \leq y$ for all $y \in B$.
   (d) Use part (c) and the definition of $\inf B$ to **prove** that $\sup A \leq \inf B$.
   (e) Can one say that $\max A \leq \min B$? Justify your answer.