University of Wisconsin-Madison
Department of Economics

Econ 703 Prof. R. Deneckere
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Homework #1

1. Prove the following proposition : If $x \in \phi$, then x is a square orange.
(Hint : Use a contrapositive proof).

2. Let A and B be sets of real numbers. Write the negation of each of the following statements:
(a) For every $a \in A$, it is true that $a^2 \in B$.
(b) For at least one $a \in A$, it is true that $a^2 \in B$.
(c) For every $a \in A$, it is true that $a^2 \notin B$.
(d) For at least one $a \notin A$, it is true that $a^2 \in B$.

3. Let $f: \Re \rightarrow \Re$ be given by the rule $f(x) = x^3 - x$. By restricting the domain and range of f appropriately, obtain from f a bijective function g. Draw the graphs of g and g^{-1} (there are several possible choices for g).

4. Define two points (x_0,y_0) and (x_1,y_1) of the plane to be equivalent if $y_0 - x_0^2 = y_1 - x_1^2$. Verify that this is an equivalence relation, and describe the equivalence classes.

5. Prove by induction that given $n \in Z_+$, every nonempty subset of $\{1,\dots,n\}$ has a largest element.