Homework #1

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1. Prove the following statement: If $x \in \phi$ then x is a blue banana. (Hint: Use a contrapositive proof).

2. Consider an exchange economy, in which the utility functions and endowments are a continuous function of a vector of parameters $\rho \in \mathbb{R}^k$. Let $E(\varrho)$ denote the set of competitive equilibrium prices of this exchange economy. Let $p \in E(\rho)$, and interpret the following statement:

   For every $\varepsilon > 0$ there exists $\delta > 0$ such that for all ρ' satisfying $||\rho - \rho'|| < \delta$ there exists $p' \in E(\rho')$ such that $||p - p'|| < \varepsilon$.

   Find the negation of this statement.

3. Write the contrapositive and converse of the following statement: "If $x < 0$, then $x^2 - x > 0$", and determine which (if any) of the three statements is true.

4. Let $f : \mathbb{R} \to \mathbb{R}$ 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).

5. Sundaram, #5, p. 67.