Practice Problems About Russell's Paradox and the Axiom of Foundation.

- (1) (Russell's pair of ducks.) Bertrand Russell gives a pair of ducks to those people, and only those people, who do not give a pair of ducks to themselves. Explain why
 - (a) Russell cannot fail to give himself a pair of ducks.
 - (b) It is not possible for Russell to give himself a pair of ducks.
- (2) Show that the union of all sets is not a set.
- (3) Find a sequence of sets satisfying $\cdots A_3 \subsetneq A_2 \subsetneq A_1 \subsetneq A_0$.
- (4) Find a sequence of sets satisfying $B_0 \in B_1 \in B_2 \in B_3 \in \cdots$.
- (5) Find all 3-element sets A such that $A \subseteq \mathcal{P}(A)$. (There are only 2 of them.)