Math 654 Homework #0 (due on 9/2/2016)

Your name:

Problem 0. *Describe a finite model of extensionality, set existence and union that has a set with at least three elements (i.e.,* $(\exists v, x, y, z)\big(v \in z \wedge x \in z \wedge y \in z \wedge x \neq v \wedge x \neq y \wedge v \neq y\big)$*).*

Problem 1. *Prove that there is no finite model of comprehension, extensionality, set existence and pairing.*

Problem 2. *Explicitly define a bijection between the closed unit ball and the open unit ball in* $\mathbb{R}^n$*.*

Problem 3. *Suppose that* R *is a well-order (i.e., a well-founded strict total order) of a set* A*. Define a strict total order* S *on* $\mathscr{P}(A)$ *such that* $\{x\}S\{y\}$ *if and only if* xRy *for all* $x, y \in A$*.*