Exam 1.

The solutions are due Wednesday March 14th before class. Either bring them to class, or send them by e-mail to my address (preferably in pdf).

1. Let N be any set. Show that for any infinite set $A \subset N$ there is an elementary submodel $M \prec N$ such that $A \subset M$ and $|A| = |M|$.

2. Let M be a transitive model of ZFC. Show that the formula $\phi(w) =$"w is a wellordering" is absolute for M, i.e. if $w \in M$ then $\phi^M(w) \leftrightarrow \phi(w)$.

3. Show that in L, every set is definable from a finite sequence of ordinals.

4. Use Problem 1 to show that in L, for every infinite cardinal κ, $|\mathcal{P}(\kappa)| = \kappa^+$