Due: June 1, 2005, in class

1. Explain why the semantics for $S5I$ without possible worlds yields the same consequence relations as the semantics in which accessibility is a universal relation.

2. Using the semantics without possible worlds, prove the following in $S5I$: $\models_S5I (\Diamond(P \land \Box Q) \equiv (\Diamond P \land \Box Q))$.

3. Using the semantics with possible worlds and without the accessibility relation, show that the following is a semantical entailment in $S5I$: $\models_S5I \{\Diamond\Box P\} \models_S5I \Diamond P$.

4. Show that $S4.3I$ contains $S4.2I$ by showing that if the accessibility relation is reflexive, transitive, and connected, then it is reflexive, transitive, and convergent.

5. Explain why in $PLI$ if a sentence is satisfied by at least one variable assignment, it is satisfied by all variable assignments.