Due: May 16, 2005, in class

1. Explain what it means to say that one system contains another, and that one system is stronger than another.

2. Using a derivation, show that the following is a theorem in BD: \( \vdash_{BD} \lozenge \Box P \supset P \).

3. Show that the following is a semantical entailment in S4I: \( \{ \lozenge \Box \lozenge P \} \vdash_{S4I} \lozenge P \).

4. Prove the following result: \( \{ \lozenge P \} \nvdash_{S4I} \Box \lozenge P \).

5. Using a derivation, show that the following is a theorem in TD: \( \vdash_{TD} \neg (\Box P \land \neg \Box P) \).