Philosophy 134
Spring, 2007
Homework 4

Due: May 2, 2007, in class

1. In *KI*, we have the conditional if $\vDash_{KI} \Box\alpha$ then $\vDash_{KI} \Box\Box\alpha$, but we have the invalidity $\nvDash_{KI} \Box\alpha \supset \Box\Box\alpha$. What is the semantical basis for the difference, and how should it be understood informally?

2. Consider "Becker's Rule," which can be stated generically (i.e., with no reference to a semantical system) as follows: $\vDash \alpha \supset \beta$, then $\vDash \Box\alpha \supset \Box\beta$. This rule holds for *S3I*. Does it as well hold for *KI*? Prove that it does, or prove that it does not.

3. Using a meta-logical derivation, give a proof of Case 8 in the proof of Modal Bivalence.

4. Consider the following claim: *KI* is closed with respect to impossibility under *KI*-entailment.

Closure of the '$\sim\Diamond$' under *KI*-Entailment?

If $\{\gamma_1, \ldots, \gamma_n\} \vDash_{KI} \alpha$, then $\{\sim\Diamond\gamma_1, \ldots, \sim\Diamond\gamma_n\} \vDash_{KI} \sim\Diamond\alpha$

Prove either that the claim is correct or that it is not correct. (This does not mean "prove that the claim is either correct or not correct!)

5. Show that the following relation of derivability ("Antilogism") holds *KD*: $\{\alpha \supset \beta\} \vdash_{KD} (\alpha \wedge \sim\beta) \supset \sim\gamma$.