Second Midterm
Philosophy 112
Winter 2001

Please work all the problems in the space provided. Each problem is worth 20 points. You may use only the rule set noted on the individual problems.

1. Prove that the following derivability relation holds in *PD*.

$\{(\exists x)(\forall y)[(Ay \,\&\, By) \supset Cxy], (\forall y)(Ay \supset By)\} \vdash (\forall y)(Ay \supset (\exists x)Cxy)$

2. Symbolize the following argument, revealing as much structure as possible and providing a symbolization key. Show that it is valid in *PD*.

Someone took something from the shelf. Anyone who took anything from the shelf was in the room last night. Therefore, someone was in the room last night.

3. Prove the equivalence of the following two sentences in *PD+*.

$(\forall x)(Ax \supset Bx)$, $\sim(\exists x)(Ax \,\&\, \sim Bx)$

4. Prove that the following is a theorem of *PDI+*.

Fa $\equiv$ ($\exists$y)(y = a & Fy)

5. Prove that the following set of sentences is inconsistent in *PD*.

{(∀x)(∀y)(Fxy ⊃Fyx),(∀x)(∀y)(Fxy ⊃ ∼Fyx), (∃x)(∃y)Fxy}