

**LGIC 010 & PHIL 005**

**Problem Set 9**

**Spring Term, 2009**

For each of the problems 1 – 3 below, determine whether or not the premises imply the conclusion. If so, present a deduction of the conclusion from the premises; if not, specify a structure in which the premises are true and the conclusion is not true.

1. (20 points)

Premise:  $(\forall x)Fx \wedge (\forall y)(Fy \supset Gy)$

Conclusion:  $(\forall x)(Fx \wedge Gx)$

2. (20 points)

Premises:

Conclusion:  $(\exists y)(Py \supset (\forall x)Px)$

3. (20 points)

Premises:  $(\forall x)((\exists y)Lxy \supset (\forall z)Lzx), (\exists x)(\exists y)Lxy$

Conclusion:  $(\forall v)(\forall z)Lzv$

4. Give deductions to show that:

(a) (20 points)  $(\forall x)(p \supset Fx)$  is equivalent to  $p \supset (\forall x)Fx$ ;

(b) (20 points)  $(\exists x)(Fx \vee p)$  is equivalent to  $(\exists x)Fx \vee p$ .