LGIC 010 & PHIL 005
Problem Set 9
Spring Term, 2011

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: $(\forall x)(\forall y)(\forall z)((Lxy \wedge Lyz) \supset Lzx), (\forall x)\neg Lxx$
   Conclusion: $(\forall x)(\forall y)(Lxy \supset \neg Lyx)$

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 $(\exists x)Fx \vee p$.