LGIC 010 & PHIL 005
Problem Set 9
Spring Term, 2013

For each of the following pairs consisting of a set of schemata X and a schema S determine whether X implies S. If so, provide a deduction to establish the implication. If not, specify a structure which makes S false and all the schemata in X true.

1. $X : \{(\forall x)(\exists y)(\forall z)(Lxz \equiv y = z),$
   $(\forall z)(\exists x)(\exists y)(x \neq y \wedge (\forall w)(Lwz \equiv (w = x \vee w = y)))\}$
   $S : p \wedge \neg p$

2. $X : \emptyset$
   $S : (\forall x)(\exists y)(Lxy \supset (\forall z)Lxz)$

3. $X : \{(\forall x)(\forall y)(\forall z)((Rxy \wedge Ryz) \supset Rxz), (\forall x)\neg Rxx, (\forall x)(\forall y)(Rxy \vee Ryx \vee x = y),$
   $(\forall x)(\exists y)(Rxy \wedge (\forall z)\neg(Rxz \wedge Rzy)), (\forall x)(\exists y)(Rxy \wedge (\forall z)(Rzy \supset (\exists w)(Rzw \wedge Rwy)))\}$
   $S : p \wedge \neg p$

4. $X : \{(\forall x)(\exists y)(\forall z)(Lxz \equiv y = z), (\forall x)(\forall y)(Lxy \supset Lyx),$
   $\neg(\forall x)(\forall y)(\forall z)((Lxz \wedge Lyz) \supset x = y)\}$
   $S : p \wedge \neg p$