PHI 100 : Introduction to Logic and Critical Analysis

Assignment Six—Fitch proofs with Quantifiers

1. Do exercises 13.2, 13.9, 13.12 and 13.16.

2. Here are some well-known properties of dyadic (2-place) relations:

$\forall x R(x,x)$	(Reflexivity)
$\forall x \neg R(x,x)$	(Irreflexivity)
$\forall x \forall y (R(x,y) \rightarrow R(y,x))$	(Symmetry)
$\forall x \forall y (R(x,y) \rightarrow \neg R(y,x))$	(Asymmetry)
$\forall x \forall y \forall z ((R(x,y) \wedge R(y,z)) \rightarrow R(x,z))$	(Transitivity)
$\forall x \forall y \forall z ((R(x,y) \wedge R(y,z)) \rightarrow \neg R(x,z))$	(Intransitivity)

   Use Fitch proofs to demonstrate that

   a Irreflexivity is a consequence of intransitivity.

   b Asymmetry is a consequence of transitivity and irreflexivity together.

   You should turn these two proofs in on paper (either hand-written, or printed out from Fitch.)

3. Do exercises 13.29 and 13.50.

If you have questions or need help, feel free to contact me at grussell@artsci.wustl.edu.

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