

# Homework 7, Philosophy 112

March 5, 2009

**Due in class:** March 10, 2009

## 1 Derivation Using Quantifier Negation Rules

Provide a derivation (using quantifier negation rules if desired) to establish the validity of the following argument.

$$\frac{(\exists x)Ax \supset (\exists x)Bx}{(\exists x)(Ax \supset Bx)}$$

## 2 Logical Truth (Derivations)

Using a derivation (using quantifier negation rules if desired), establish that the following sentence is a logical truth.

$$(\forall x)(Ax \supset Bx) \vee (\exists x)Ax$$

## 3 Contradiction (Formal Semantics)

Using the formal semantics, show that the following sentence is a contradiction.

$$(\forall x)(Fx \ \& \ Gx) \ \& \ (\exists x)\sim Fx$$

## 4 Inconsistency (Derivations)

Using a derivation (without quantifier negation rules), show that the following set of sentences is inconsistent.

$$\{(\exists x)(\forall y)(Hxy \supset (\forall w)Jww), (\exists x)\sim Jxx, \sim(\exists x)\sim Hxm\}$$

## 5 Logical Equivalence (Formal Semantics)

Prove, by providing a counterexample in the formal semantics, that the following two sentences are not logically equivalent.

$$(\forall x)Fx \supset A, (\forall x)(Fx \supset A)$$