

**HW #10** Due 12/14 in my office (307 CLA) by 2pm  
Phi 321 Formal Logic, Fall 2015  
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Provide derivations to prove the following arguments valid:

1.  $(\forall x)(x=a \supset Ba) \therefore Ba$
2.  $(\forall x)(a=x \equiv b=x) \therefore a=b$
3.  $\sim(\exists x)(\forall y)(My \equiv y=x). (\exists x)Mx. \therefore (\exists x)(\exists y)((Fx \& Fy) \& x \neq y)$
4.  $(\exists x)Px. (\forall x)(x=a \vee x=b). \therefore Pa \vee Pb$

Provide a derivation to prove the following theorem:

5.  $(\forall x)(\forall y)((\sim(Gx \supset Gy) \supset x \neq y)$