

**Homework 6**

Show that the following arguments are valid by constructing formal proofs. You may use any of the inference rules — i.e. the propositional calculus rules, plus EE, EI, UE, UI. (Note: “ $P$ ” stands for an atomic sentence.)

1.  $(x)(Fx \rightarrow \neg Gx) \vdash \neg(\exists x)(Fx \& Gx)$
2.  $(x)((Fx \& Gx) \rightarrow Hx), \neg(\exists x)Hx \vdash (x)(Fx \rightarrow \neg Gx)$
3.  $(x)(P \vee Fx) \vdash P \vee (x)Fx$
4.  $(x)Fx \rightarrow P \vdash (\exists x)(Fx \rightarrow P)$
5.  $\vdash (x)(Fx \vee \neg Fx)$
6.  $\vdash (\exists x)(Fx \rightarrow (y)Fy)$