

Predicate Calculus with Quantifier Equivalence Rules.

1. $\forall x \sim Fx \rightarrow \exists y Gy, \sim \exists x Fx \vdash \sim \forall y \sim Gy$
2. $\sim \exists x Fx, \sim \exists x Gx \vdash \sim \exists x (Fx \vee Gx)$
3. $\forall x \sim \exists y \sim (Fxy \rightarrow Fyx), \exists x Fxa \vdash \sim \forall x \sim Fax$
4. $\vdash \sim \forall x \exists y Fxy \rightarrow \exists x \sim Fxa \ \& \ \exists x \sim Fxb$
5. $\sim \exists x \exists y Gxy \vdash \exists x Gxx \rightarrow \sim \forall x Fx$
6. $\sim \exists x (Fx \ \& \ Gx) \vdash \forall x (Fx \rightarrow \sim Gx)$
7. $\sim \forall x (\exists y Fy \rightarrow Gx) \vdash \sim \forall z Gz$
8. $\vdash \exists x Fx \vee \exists x \sim Fx$
9. $\forall x ((Fx \vee Hx) \rightarrow (Gx \ \& \ Kx)); \sim \forall x (Kx \ \& \ Gx) \vdash \exists x \sim Hx$
10. $\sim \exists x Fxx, \forall x \forall y \forall z ((Fxy \ \& \ Fyz) \rightarrow Fxz) \vdash \sim \exists x \exists y (Fxy \ \& \ Fyx)$