Logic precept: Week 7

Review

1. What kinds of sentences are there in predicate logic?
2. What is the difference between a **formula** and a **sentence**?
3. What is an **instance** of a universal sentence?
4. What is the restriction on UI?

Proofs

Warmup Problems

1. $\forall x(Fx \to Gx) \vdash \forall xFx \to \forall xGx$
2. $\forall x(Px \to Qx),\ \forall x(Qx \to Rx) \vdash \forall x(Px \to Rx)$
3. $P \to \forall xFx \vdash \forall x(P \to Fx)$
4. $\forall x\forall yRxy \vdash \forall y\forall xRxy$

Pset Problems

1. $\forall x(Fx \to \forall yGy) \vdash \forall x\forall y(Fx \to Gy)$
2. $\forall x\forall y(Fx \to Gy) \vdash \forall x(Fx \to \forall yGy)$
3. $\vdash \forall x(\forall yRxy \to Rxx)$

Translation

Exercise

How do you symbolize the following?

1. All F are G.
2. No F are G.
3. Some F are G.
4. Some F are not G.

Exercise

Use F for "is French", G for "is German", C for "is Canadian", Lxy for "x likes y", a for Alice, and b for Bob. How would you symbolize:

1. Alice likes Canadians.
2. Alice likes Bob only if Bob likes Canadians.
3. Alice likes Bob only if he likes her.
4. Alice is a German who likes Canadians.
5. Alice is French only if she doesn't like Canadians.
6. Alice likes only those people who don't like Canadians.
7. Someone likes only those people who like Canadians.
8. French people only like Canadians who don't like Germans.
9. Some French people like only those Germans who don't like themselves.