Test 8 10pts. (1 pt. per question.)

1. Is the following a proper translation in Q? If not, write a correct one.

Not all armadillos are vicious.

¬Va

This is incorrect because 'armadillos' is not a name, but a predicate.

 $\neg \forall x(Ax \rightarrow Vx)$

2. Is the following a proper formula of Q? If not, explain what is wrong with it.

(∃xFxy & ∀zGz)

This is incorrect because y is an unbound variable.

Provide translations in Q for 3-10. Use the obvious letters for predicates and constant.

3. Bob knows Sarah but he doesn't know Abe.

Kbs & ¬Kba

4. Everyone doesn't know someone.

 $\forall x (Px \rightarrow \exists y (Py \& \neg Kxy))$

5. Nobody doesn't like Sarah Lee. (Assuming Sarah Lee is a person, not a kind of pastry).

ר∃x(Px & ¬Lxs)

6. There are no cowardly pumas.

⊐∃x(Cx & Px)

7. A clown followed Michael and killed him.

 $\exists x((Cx \& Fxm) \& Kxm)$

8. Clowns and mimes hate each other.

 $\forall x \forall y \text{ ((Cx \& Mx) \rightarrow (Hxy \& Hyx))}$

9. A green Mercedes ran over Ethel.

∃x ((Mx & Gx) & Rxe)

10. Carnivals only hire drug addicts.

 $\forall x(Cx \rightarrow \forall y(Hxy \rightarrow Dy))$