## Math 69 Winter 2017 Tuesday, January 17

Here is an ad hoc language of first order logic with intended translations for the parameters. Translate the given sentences.

Universal quantifier  $\forall$  (for all things). Constant symbols A (Adams), C (Cai), and S (Sara Lee). Unary predicate symbols J (is a job) and P (is a person). Binary predicate symbols D ( \_\_\_\_\_ can do \_\_\_\_ right) and L ( \_\_\_\_\_ likes \_\_\_\_). Ternary predicate symbol B ( \_\_\_\_\_ can do \_\_\_\_\_ better than \_\_\_\_\_). Unary function symbol f (the boss of).

Adams can't do any job right.

Cai can do some jobs better than Cai's boss.

Nobody can do any job better than Cai.

Everybody doesn't like something, but nobody doesn't like Sara Lee.

Here is a formula in the same language. (Well, actually it is not a formula, as it employs parenthesis-omitting conventions. But it represents a formula.) Identify the bound and free variables, and translate the formula into English. Note that the free variables will appear in the English sentence.

 $Px \land \forall y (Jy \to \neg Lxy) \land \forall z (Jz \to Dyz)$