Quiz 1

Show *all* your work. No credit is given without reasonable supporting work. There are *two* sides to this quiz and all logic symbols make use of the textbook notation.

1. [2] (logic wks #1) Define the *propositions* p and q below:

   p:

   q:

   (a) [2] (§1.1 #8) Express $p \rightarrow q$ as an English sentence.

   (b) [2] (§1.3 #7) Express $\neg(p \wedge q)$ as an English sentence.

2. [4] (§1.3 #41) Find a compound proposition involving the propositional variables p, q, and r that is true when exactly two of p, q, and r are true and is false otherwise.

3. (§1.4 #32e) Consider the following statement, "There is a pig that can spin spider webs and talk."

   (a) [2] Express the statement above using predicates, quantifiers, and logical connectives.

   (b) [2] Negate part (a) so that no negation is to the left of a quantifier.

4. [2] (9/26 lecture) Let the domain be integers between -4 and 3 inclusive. Determine the truth value of $\forall x, \exists y, (x + y > 0)$. Support your conclusions!

5. [4] (§1.2 Ex7) Suppose you are on an island that has two kinds of inhabitants, knights, whoa lways tell the truth, and their opposites, knaves, who always lie. You encounter two people A and B. What are A and B if A says "B is a knight" and B says "The two of us are opposite types"?