Quiz 1, Math Thought

Dr. Graham-Squire, Spring 2016

Name: _____

1. (5 points) Let a *pogo* integer be an integer of the form $5n + 1$ for some $n \in \mathbb{Z}$, a *bird* integer be of the form $5n + 2$ for some $n \in \mathbb{Z}$, and a *dog* integer be of the form $5n + 4$ for some $n \in \mathbb{Z}$. Prove that a dog integer plus a bird integer will always be equal to a pogo integer.

2. (3 points) Are the following two statements logically equivalent, negations of each other, or neither? Justify your answer.

$$(P \rightarrow Q) \rightarrow Q \qquad \text{and} \qquad \neg(Q \vee \neg P) \vee Q$$

3. (2 points) Use both (a) the roster method and (b) set builder notation to specify the set "All positive odd integers less than 50 which are divisible by 3." (Note: it is okay to use ... in your set, but it should be used in a way such that the pattern is clear.)