Math 3520 - Quiz 6

Name:_____

Type proof in complete and **proper English**. Make certain to use **complete sentences** and **state what you are trying to prove**. Your work should stand on its own and be clear to you or a future student without any additional explanation. If it is not immediately clear to you it won't be clear to you in the future nor will it be clear to other students.

1. Let $a, b, c \in \mathbb{Z}$ and let $a \neq 0$. If $a|b$ and $a|c$ then $a|bx + cy$ where $x, y \in \mathbb{Z}$.

2. Let $n \in \mathbb{N}$. Then $8|5^{2n} + 7$. Here I used induction.

3. Let n be an integre so that $n \geq 2$. Let b be the largest divisor of n strictly less than n. So $n = ab$ for some $a \in Z$. Prove a is prime.

4. Problems 12.15 a,c,e,g fromthe text book.

5. Let $m \in \mathbb{Z}$. Then one of $m, m + 4, m + 8, m + 12, m + 16$ is divisible by 5.

6. If a and b are odd integers then $4|a - b$ or $4|a + b$.