Math 333 Problem Set 2
Due: 02/17/16

Be sure to list EVERYONE in the that you talk to about the homework!

1. Find the quotient and remainder when $a = -614$ is divided by $b = 13$.
2. Prove that the square of any integer a is either of the form $3k$ or $3k+1$ for some integer k.
3. Use the division algorithm to prove that every odd integer is of the form $4k + 1$ or $4k + 3$ for some integer k.
4. If $a \mid b$ and $b \mid c$, prove that $a \mid c$.
5. If $a \mid b$ and $a \mid c$ prove that $a \mid (bm + cn)$ for all integers $m, n \in \mathbb{Z}$.
6. If $a \mid c$ and $b \mid c$, does $ab \mid c$? Be sure to justify your answer.
7. Prove that $\gcd(n, n + 1) = 1$ for all $n \in \mathbb{Z}$.