Math 441 - Homework 1 Due Friday, Sept. 4th

1. Suppose p and q are integers. Recall that an integer m is even iff $m = 2k$ for some integer k and m is odd iff $m = 2k + 1$ for some integer k. Prove the following.

   (a) If p is odd and q is odd, then $p + q$ is even.

   (b) If p is odd and q is odd, then pq is odd.

2. Prove or give a counterexample: The sum of any five consecutive integers is divisible by 5.

3. Prove: If $U = A \cup B$ and $A \cap B = \varnothing$, then $A = U \backslash B$.