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 that if p is odd and q is odd, then pq is odd.

   Proof. Enter your solution here...

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

3. Prove that $\log_2(5)$ is irrational.

4. Prove or give a counterexample: $2n^2 + 29$ is a prime number for all integers $n \geq 0$.