Math 4200

Definitions: An integer n is <u>even</u> provided $n = 2k$ for some integer k. An integer n is <u>odd</u> provided $n = 2k+1$ for some integer k. A positive integer p is a <u>prime number</u> provided $p > 1$ and p is only divisible by 1 and p.

Theorem: Suppose a and b are integers and p is a prime number. If p divides ab then p divides a or p divides b.

Proof. The prime factorization of ab is obtained by simply multiplying the prime factorization of a by the prime factorization of b. If p divides ab then p must be one of the primes listed in the prime factorization of ab. So p must be one of the primes in the factorization of a or one of the primes in the factorization of b. Hence p divides a or p divides b.