Prove by contradiction that, if n^2 is even, then n is even

Assume that n is odd $n = 2k + 1$

$n^2 = (2k + 1)^2$

$n^2 = 4k^2 + 4k + 1$
$n^2 = 2(2k^2 + 2k) + 1$

This is an odd number

This is a **contradiction**, since n^2 is an even number

Therefore if n^2 is even, then n is even