Write a proof by contraposition of proposition stated below, using only the definition of odd/even number.
If \( n \in \mathbb{Z} \), and \( n^2 \) is even, then \( n \) is even.

Proof
Let \( n \) be any arbitrarily chosen integer and suppose \( n \) is odd.
Then \( \exists k \in \mathbb{Z} \) such that \( n = 2k + 1 \).
Then \( n^2 = (2k + 1)^2 = 4k^2 + 4k + 1 = 2(2k^2 + 2k) + 1 \).
Thus \( n^2 = 2b + 1 \) where \( b = 2k^2 + 2k \), so \( n^2 \) is odd.
We have shown that if the conclusion is false, then the hypothesis is false.
This completes the proof by contraposition.