EDITING ASSIGNMENT

Find all mathematical, grammatical, stylistic, and LaTeX errors in the following proof. Then rewrite it correctly on the lines below.

Definition. An integer n is *even* iff there exists an integer k such that $n = 2k$.
Definition. An integer n is *odd* iff there exists an integer k such that $n = 2k + 1$.

Theorem. The product of an odd number and the square of an even number is even.

PROOF.

let $m = 2k + 1$ be an odd # and $n = 2k$ be an even #.

$m^2 n$ is equivalent to $(2k+1)^2(2k) = (4k^2 + 4k + 1)(2k) = 4k^2(2k) + 4k(2k) + 1(2k) =$

$8k^3 + 8k + 2k$.

Obviously, $8k^3$, $8k$, and 2k are even numbers, so there sum is even.

Thus, $m^2 n$ was found to be even

For example, when $m = 5 and n = 4$, I found that $m^2 n$ is $=$ to 100.

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Here are the errors in the proof. Numbers refer to sentence numbers.

- The proof should be begin immediately after the word PROOF.
- The entire proof should be written in paragraph form.
- 1. Capitalize the first word of the sentence.
- 1. Split this sentence in two: The first sentence should be "Let m be an odd integer and n be an even integer." In the second sentence we apply the definition of even and odd.
- 1. Do not use k for both the even and the odd numbers.
- 1. Don't use a symbol ($\#$) in place of a word.
- 2. Start the sentence with a word, not a mathematical expression.
- 2. The correct expression is mn^2, not m^2n.
- 2. "Equivalent to" is a term we use for logical expressions, not numbers. It should be "equal to"—and in fact, we should just use "=."
- 2. Algebra error: the term $8k$ should be $8k^2$.
- 2. In a 200-level math class we do not have to show all of these algebraic details.
- 3. This is not how we show that a number is even—we must show that mn^2 satisfies the definition of even.
- 3. Do not use the word "obviously."
- 3. In a proof like this we'd have to show that the three terms satisfy the definition of even.
- 3. "There" should be "their."
- 3. Missing dollar signs around 2k in the LATEX code.
- 4. Do not use the passive voice.
- 4. Missing period at the end of the sentence.
- 4. and 5. Write in present tense.
- 5. Do not put an example in a proof.
- 5. There are missing dollar signs in the LATEX: after $m = 5$ and before $n = 4$.
- 5. It should be first person plural, not first person singular ("we" not "I").
- 5. Replace "is = to" with "=."

Corrected proof:

PROOF. Let m be an odd integer and n be an even integer. By the definition of odd and even, there exist integers k and l such that $m = 2k + 1$ and $n = 2l$. We see that $mn^2 = (2k+1)(2l)^2 = 2(4kl^2 + 2l^2)$. Because $4kl^2 + 2l^2$ is an integer, mn^2 is even. $\square$