

Evaluation of Proof Exercise

Following the instructions for [\(linked\) Evaluation of Proofs](#) exercises (which also are posted on the course homework page), evaluate the below justification of the given conjecture.

►. **Conjecture A.** If  $m$  is an odd integer, then  $m + 6$  is an odd integer.

*Proposed Proof.* For  $m + 6$  to be an odd integer, there must exist an integer  $n$  such that

$$m + 6 = 2n + 1.$$

By subtracting 6 from both sides of this equation, we obtain

$$\begin{aligned} m &= 2n - 6 + 1 \\ &= 2(n - 3) + 1. \end{aligned}$$

By the closure properties of the integers,  $(n - 3)$  is an integer, and hence, the last equation implies that  $m$  is an odd integer. This proves that if  $m$  is an odd integer, then  $m + 6$  is an odd integer.  $\square$

**Warning.** If you provide a proof, you may **not** use the lemmas on the [Ch. 1 handouts](#). So you can **not** use Lemma POO and friends. **Use** the definition of even/odd.

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DELETE this whole sentence and THEN put your answer to ALL parts down here.