Discussion Mock Quiz Problem 2

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Exercise 1

(10 imaginary points) Let $m, n \in \mathbb{Z}$. Prove that $-m < -n$ if and only if $m > n$.

(This is part of Proposition 2.12.)

Here is an example proof that is very clear:

The careful iff proof. First suppose that $m > n$. By definition, this means $m - n \in \mathbb{N}$. Now observe that

$$(-n) - (-m) = (-n) + m = m - n \in \mathbb{N}.$$

Hence $-n > -m$, i.e. $-m < -n$.

Conversely, suppose $-m < -n$. By definition, this means

$$(-n) - (-m) = m - n \in \mathbb{N}.$$

Hence $m > n$ by definition.

□

Rubric:

- *4 pts:* Style - Used complete sentences, marked beginning and end of proofs, etc.
- *3 pts:* Forward direction - Used definition of "¡" or similar argument
- *3 pts:* Backwards direction