MH3100 Quiz #5 $\frac{12}{12}$ Name: The Prof

① Let A be the set of negative integers. Write A in curly bracket notation (i.e., $A = \{? : ??\}$).

(3pts) $A = \{x \in \mathbb{Z} : x < 0\} = \{-n : n \in \mathbb{N}\}$.

$= \{-1, -2, -3, \ldots\}$ ← all correct answers.

② True or false:

(2pts) (a) $\{5\} \in \mathbb{N}$. False ($5 \in \mathbb{N}$ but $\{5\} \notin \mathbb{N}$)

(2pts) (b) $\{\emptyset\} \subseteq \{\{\emptyset\}\}$. False. $\emptyset$ is the element of $\{\emptyset\}$, but $\emptyset$ is not an element of $\{\{\emptyset\}\}$.

③ Prove the following:

(5pts) For every positive integer a, there is a positive integer b such that $b > 2a$.

Proof. Let a be ~~an inte~~ integer.

Let $b = 2a + 1$

Then $b > 2a$, since $2a + 1 > 2a$.

Thus, for every positive integer a, we have shown that there exists a positive integer b such that $b > 2a$.

QED

Remark. Many other choices for b would also work, e.g., $b = 3a$.