Math 55 Quiz 2 Name: _____
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1. True or False? No justification needed.

   (a) $\{x \in \mathbb{R} \mid x^2 + 1 = 0\} \subseteq \mathbb{Z}$.

   (b) The function $f : \mathbb{Z} \to \mathbb{Z}$ given by $f(x) = x^3$ is one-to-one.

   (c) If A and B are both countable, then so is $A \cup B$.

2. Let $f : A \to B$ be a function from sets A, B. Define what it means for f to be onto.

3. Let $f : A \to B$ be a function. Given a subset $S \subseteq B$, define $f^{-1}(S) = \{x \in A \mid f(x) \in S\}$. Given $S, T \subseteq B$, prove that $f^{-1}(S \cap T) = f^{-1}(S) \cap f^{-1}(T)$.