

1. What is your name?
2. Write two paragraphs that explain why the following proposition is true:

$$\exists! A \in \{ \text{sets} \} \ni (\nexists B \in \{ \text{sets} \} \ni (A \sim B \wedge A \neq B))$$

Sample explanation:

The only choice for A is \emptyset because our definition of \emptyset implies that \emptyset and only \emptyset is such that $|\emptyset| = 0$. The cardinality of any non-empty finite is a positive integer. And there are infinitely many finite sets with cardinality 1, infinitely many finite sets with cardinality 2, infinitely many finite sets with cardinality 3, But only one finite set with cardinality 0.

But what about infinite sets? We'll see with our upcoming homework that two different infinite sets can have the same cardinality (e.g., $(\mathbb{Z} \text{ and } \mathbb{N})$ or $([0, 1] \text{ and } [2, 3])$. And I suspect each infinite set can be put in a one-to-one correspondence with at least one other infinite set. I'm not suggesting that any two infinite sets are equivalent, only that each infinite is equivalent to some other (but not all) infinite sets.

3. Smile.

