

Name, Last Name:

Grade:

Student No:

Math 103: Quiz # 3

Spring 2007

You have 50 minutes.

1.a) Give the statement of the Axiom of Specification. (5 points)

1.b) Give the statement of the Power set Axiom. (5 points)

1.c) Give the definition of the difference set of two sets. (5 points)

2. Prove that there is a set with no elements. (20 points)

3. Let A and B be sets. Prove the following statement. (20 points)

$$((A \subseteq B) \wedge (B \subseteq A)) \Rightarrow (A = B).$$

4. Let A and B be two sets. Show that $\mathcal{P}(A) \setminus \mathcal{P}(B) \neq \mathcal{P}(A \setminus B)$. (15 points)

5. Let for all $n \in \mathbb{Z}$, I_n be the interval $(-\frac{1}{n}, n)$. Prove that $\bigcap_{n \in \mathbb{Z}^+} I_n \subseteq [0, 1)$. (30 points)