Name, Last Name: **Grade:**

Student No:

Math 103: Quiz # 8

Spring 2007

You have 45 minutes.

1. Give the definition of the following terms.

a) a sequence in a set A. (5 points)

b) a sequence of distinct terms in a set A. (5 points)

c) a strictly increasing sequence in a poset B. (5 points)

d) a subsequence of a sequence in a set A. (10 points)

e) a convergent real sequence. (5 points)

f) a convergent real series. (5 points)

g) the geometric series. (5 points)

2. Let $m, n \in \mathbb{Z}^+$ and $\forall k \in \mathbb{Z}^+$, $I_k := \{j \in \mathbb{Z}^+ | j \leq k\}$. Prove that there is an onto function $f : I_m \to I_n$ if and only if $n \leq m$. (30 points)

Hint: You may use the theorem on the non-existence of onto functions mapping proper subsets of I_n onto I_n without proof.

3. Construct a bijection mapping $A := \{3m | m \in \mathbb{Z}^+\}$ onto $A := \{2n | n \in \mathbb{N}\}$. You must prove that the relation you define is actually a bijection (40 points)