Math 299 **Homework 9/11** **Fall 2013**

1. Find a concrete bijection between the intervals $(0, 1)$ and $(5, 8)$ in $\mathbb{R}$. Also, write a formula for the inverse of that function.

2. Consider the function $q : \mathbb{Z}\times\mathbb{Z} \longrightarrow \mathbb{Z}\times\mathbb{Z}$ defined by $q(a, b) = (a+b, a-b)$. Determine if q is a bijective function or not. Show your work rigorously using complete sentences.

3. Is the set of all functions from $[3]$ to $\mathbb{N}$ countable? *Hint: Compare this set with a set you are more familiar with.*

4. (Extra Credit) Find a bijection from the interval $[0, 1)$ to the interval $(0, 1)$. *Hint: Use decimal expansion.*