

## CSE 311 Quiz Section: December 6, 2012

### 1 Determining Countability

Determine whether each of these sets is finite, countably infinite, or uncountable. For those that are countably infinite, exhibit a one-to-one correspondence between the set of positive integers and that set.

- a) the integers that are multiples of 7
- b) the integers less than 100
- c) the real numbers between 0 and  $\frac{1}{2}$
- d) the real numbers not containing 0 in their decimal representations
- e) all bit strings not containing the bit 0
- f) all positive rational numbers that cannot be written with denominators less than 4

### 2 Sets and Countability

- a) Show that if  $A$  and  $B$  are sets,  $A$  is uncountable, and  $A \subseteq B$ , then  $B$  is uncountable.
- b) If  $A$  is an uncountable set and  $B$  is a countable set, must  $A - B$  be uncountable?