CS3133
HW#1

DUE: Tuesday, September 5

1. (8 points)
   a) Prove that the union of two disjoint countably infinite sets is countably infinite.
   b) Prove that the union of two disjoint countable sets is countable.

2. (10 points) A total function $f : \mathbb{N} \to \mathbb{N}$ is monotone increasing if $f(n) < f(n+1)$ for all $n \in \mathbb{N}$. Is the set \{ $f : \mathbb{N} \to \mathbb{N}$ | $f$ is monotone increasing and total \} countable? Justify your answer.