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 $f : N \to N$ is *monotone increasing* if $f(n) < f(n+1)$ for all $n \in N$. Is the set $\{ f : N \to N \mid f \text{ is monotone increasing and total} \}$ countable? Justify your answer.