

Homework Assignment #8
Due: November 23, 4:00 p.m.

1. Let $S = \{0, 1\}$.

(a) Let F_1 be the set of all functions $f : S \rightarrow \mathbb{N}$.

For example, the function f that has $f(0) = 92873$ and $f(1) = 908$ is one element of F_1 .

Is F_1 countable? Prove your answer is correct.

(b) Let F_2 be the set of all functions $f : \mathbb{N} \rightarrow S$.

For example, the function f defined by $f(n) = n \bmod 2$ for all $n \in \mathbb{N}$ is one element of F_2 .

Is F_2 countable? Prove your answer is correct.