



INTRODUCTION TO ABSTRACT MATHEMATICS
FALL 2013

ASSIGNMENT 10.3
DUE NOVEMBER 15

Exercise 1. Show that, using our “technical” definition of finite, for any $n \in \mathbb{N}$ and any $A \subseteq I_n$, A is also finite, and $|A| \leq n$. Conclude that if $f : B \rightarrow I_n$ is an injection, then B is finite, and $|B| \leq n$.

Exercise 2. Suppose that A and B are finite sets and that $|A| = |B|$. Let $f : A \rightarrow B$ be a function. Show that f is injective if and only if it is surjective.

Exercise 3. Show that if A is infinite and $x \notin A$, then there is a bijection $f : A \cup \{x\} \rightarrow A$. That is, for infinite sets, “ $|A| + 1 = |A|$ ”.