Theorem 1.5.7: If $A \subset B$ and B is countable, then A is either countable or finite.

Fill in the details of the proof:

- If A is finite, then we are done.
- Suppose A is infinite. We want to define one-one onto $g : \mathbb{N} \to A$
  - Let $f : \mathbb{N} \to B$ be one-one onto $b_1, b_2, b_3, \ldots$
  - Let $n_1 = \min \{n \in \mathbb{N} \mid f(n) \in A\}$. i.e. Find first element of A in the listing of B
    Define $g(1) = f(n_1)$
  - Let $n_2 = \min \{n \in \mathbb{N} \mid f(n) \in A - \{g(1)\}\}$. i.e. Find next element of A in the list
    Define $g(2) = f(n_2)$
  - Use the same process to define the general terms n_i and $g(i)$
  - Use that f is one-one and onto to show that g is one-one onto