Problem 10. Show that if $X$ is finite and $Y \subseteq X$, then $Y$ is finite. (Hint: Use induction.)

Problem 11. Prove that for all $n \in \mathbb{N}$, $f : I_n \rightarrow I_n$ is an injection if and only if $f$ is also a surjection.

Problem 12. Use the result stated in the previous problem to prove that if $X$ is a finite set and $f : X \rightarrow X$, then $f$ is an injection if and only if it is a surjection.