Exercises

3.147 [2BX] Let A, B be non-empty sets.

- Suppose that $f : A \to B$ is an injective function: there exists a surjective function $g : B \to A$ such that $g \circ f = \mathrm{Id}_A$ (the identity function). (Such g is a *left inverse* of g).
- Suppose that $g : B \to A$ is a surjective function: there exists a injective function $f : A \to B$ such that $g \circ f = \mathrm{Id}_A$. (Such f is a *right inverse* of g).

The proof of the second statement requires the Axiom of Choice (see [2BZ]).

Vice versa.

- If $f : A \to B$ has a *left inverse* then it is an injective function.
- If $g : B \to A$ has a *right inverse*, then it is a surjective function.

Solution 1. [2BY]