Axiom of choice

Every surjection has a section.

Recall that a section for a function is a function $s$ such that

$$e_0 s = 1_A$$

$\xymatrix{ A \ar[r]^e & B \ar[l]_s }$
When \( e : A \to B \) is a surjection, we know that

\[ \forall b \in B. \exists a \in A. \ e(a) = b \]

A section \( s : B \to A \) postulated by the Axiom of Choice chooses for every \( b \in B \) an element \( a \in A \), namely \( s(b) \), such that \( e(a) = b \).