

Theorem (Cantor–Schröder–Bernstein)

Let A, B be sets. If there exist injective maps

$$f: A \rightarrow B, \quad g: B \rightarrow A,$$

then there exists a bijection $h: A \rightarrow B$.

Said another way...

$$(|A| \leq |B|) \wedge (|B| \leq |A|) \implies |A| = |B|.$$

The video has a “visual” proof