

Name: _____

Lecture 28, class activity. Cantor–Schröder–Bernstein.

- We showed in lecture that $|[a, b]| = |[c, d]|$ for any $a < b$ and $c < d$.
- Now we show that $|[a, b]| = |[c, \infty)|$ for any $a < b$ and any $c \in \mathbb{R}$.

A. First we consider $A = [0, 1]$ and $B = [1, \infty)$. Write down an injection $f: A \rightarrow B$.

B. Now write down an injection $g: B \rightarrow A$.

C. How does this prove that $|[0, 1]| = |[1, \infty)|$?

D. Now we show that $|[1, \infty)| = |[c, \infty)|$ for any $c \in \mathbb{R}$. Can you write down a bijection between these two sets?

E. Now argue that $|[a, b]| = |[c, \infty)|$ for any $a < b$ and any $c \in \mathbb{R}$.