Seventh lecture

- **Functions**

  $f : A \to B$, **domain/codomain**

  Composition

  Injections, surjections, bijections

  $f : X \hookrightarrow Y \qquad f : X \twoheadrightarrow Y \qquad f : X \rightleftarrows Y$

  Inverse functions

- **The pigeonhole principle**

- **Counting**

  Cardinality, $|A| = |B|$

  Finite, countable, uncountable sets

  $\mathbb{Q}$ **is countable,** $\mathbb{R}$ **uncountable**