

Math 300 Intro Math Reasoning
Worksheet 09: Equinnumerability

(1)

(1) Let $Y = \{n + 2 \mid n \in \mathbb{N}\} \subseteq \mathbb{N}$. Find a bijective map $f : \mathbb{N} \longrightarrow Y$.

(2) Show that $(-1, 2) \sim (6, 7)$

(3) Find an injection from $\mathbb{N} \times \mathbb{N}$ into $P(\mathbb{N})$.

(2) Suppose that $A \sim A'$ and $B \sim B'$. Prove that $A \times B \sim A' \times B'$

(3) Prove that $P(\mathbb{N} \times \mathbb{Z}) \sim {}^{\mathbb{N}}\{0, 1\}$

(4) Suppose that A is countable (and infinite) and $a \notin A$. Show that $A \cup \{a\} \sim A$

(5) Suppose that $A \sim A'$, $B \sim B'$. Show that ${}^AB \sim {}^{A'}B'$.