

Homework 10

MATH 300

(due April 19)

April 12, 2024

Problem 1. Show that $P(\mathbb{N}) \times P(\mathbb{N}) \approx P(\mathbb{N})$.

[Hint: Use the interleaving function exercise from the previous HW.]

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Problem 2. Prove that $P(\mathbb{Z} \times \mathbb{Z}) \times P(\mathbb{Z}) \sim P(\mathbb{N})$.

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Problem 3. Prove that if $A \sim A'$ and $B \sim B'$ are sets such that $A \cap B = A' \cap B' = \emptyset$ then $A \cup B \sim A' \cup B'$.

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Problem 4. Prove that for any function $f : A \rightarrow B$, $|f| = |A|$. [Remark: recall that a function is a set of ordered pairs.]