

Math 2326 - Introduction to Abstract Mathematics
Assignment 15 - Due Friday, February 22

Problem 56: Let $n \in \mathbb{N}$ and $i, j \in I_n$. Define $h : I_n \rightarrow I_n$ by

$$h(x) = \begin{cases} x & \text{if } x \neq i \text{ and } x \neq j, \\ j & \text{if } x = i, \\ i & \text{if } x = j. \end{cases}$$

Prove that h is a bijection.

Problem 57:

Prove the following statement: For all $n \in \mathbb{N}$, if $f : I_n \rightarrow I_n$ is an injection then f is also a surjection.

Problem 58:

Use the result stated in Problem 57 to prove that if X is a finite set and $f : X \rightarrow X$ is an injection then it is also a surjection.