

Homework Assignment to be Handed In # 6

First Submission Due: 5-2-06

Please hand in the following problem:

Prove that

(1) $f : \mathbb{Z}_4 \rightarrow \mathbb{Z}_8$ given by

$$f(x/ \equiv_4) = (2x)/ \equiv_8$$

is an injection, but not a bijection.

(2) $f : \mathbb{Z}_4 \rightarrow \mathbb{Z}_2$ given by

$$f(x/ \equiv_4) = (3x)/ \equiv_2$$

is a surjection, but not a bijection.

(3) $f : \mathbb{Z}_6 \rightarrow \mathbb{Z}_6$ given by

$$f(x/ \equiv_6) = (x + 1)/ \equiv_6$$

is a bijection.

(4) $f : \mathbb{Z}_4 \rightarrow \mathbb{Z}_4$ given by

$$f(x/ \equiv_4) = (2x)/ \equiv_4$$

is neither an injection nor a surjection.