

Infinity I Homework

Advanced 1

January 27, 2020

Problem 1.

Let $A = \{1, 2, 3\}$, $B = \{a, b, c, d\}$, $C = \{x, y, z\}$.

1. How many functions are there from A to B ? From A to C ?
2. How many bijections are there from A to B ? From A to C ?
3. How many bijections are there between two sets with n elements each?

Problem 2.

Let A be a set with n elements. Prove that there are as many subsets of A with even number of elements, as there are with odd number of elements. *Hint:* Construct a bijection.

Problem 3.

Construct a bijection between the set of natural numbers and nonnegative integers that have remainder 0, 1 or 2 when divided by 100: $\{0, 1, 2, 100, 101, 102, 200, 201, 201, \dots\}$.