

## Homomorphisms

## Why

We name a function which preserves algebraic structure.

## **Definition**

A group homomorphism between two groups (A, +) and  $(B, \tilde{+})$  is a bijection  $f: A \to B$  such that  $f(1_A) = 1_B$  for  $1_A \in A$  and  $1_B \in B$  and  $f(a + a') = f(a)\tilde{+}f(a')$  for all  $a, a' \in A$ . We define a ring homomorphism and field homomorphism similarly.

