### Definition: Group

A group is a semigroup with a neutral element, in which each element is invertible.

2.1. The semigroup ments are invertible.The semigroups the set of all bijective functions from (Let M ((ℳ, ∘ℕ, +)) is not a group because not all of its elements are invertible, (ℕ0, +) and ℳM(ℤ, · ∶= {f : M → M|f is a bijective function} to )M are not groups because not all of their ele-.

3. because it may contain non-injective functions be a non-empty set and let inv ). be

∘ .

is a bijective mapping and therefore invertible. Furthermore, is a bijective mapping from for all f ∈ ℳM to invM.

It follows that ℳinv. (ℳinv, ∘) is a group.

Let Definition: Order of a Group(G, ∗) be a group. Then the cardinality of the set G, namely |G|, is the order of the So for groups with a finite set G, the order of the group is simply the number of elements group. in G.