Definition 5.2. [1ZF] (Solved on 2022-11-15) *A **group** is a set G equipped with a binary operation $*$, that associates an element $a * b \in G$ to each pair $a, b \in G$, respecting these properties.*

1. *Associative property: for any given $a, b, c \in G$ we have $(a*b)*c = a * (b * c)$.*

2. *Existence of the neutral element: an element denoted by e such that $a * e = e * a = a$.*

3. *Existence of the inverse: each element $a \in G$ is associated with an **inverse element** a', such that $a * a' = a' * a = e$. The inverse of the element a is often denoted by a^{-1} (or $-a$ if the group is commutative).* [a]

*A group is said to be **commutative** (or abelian) if moreover $a * b = b * a$ for each pair $a, b \in G$.*

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[a] The notation a^{-1} is justified by the fact that the inverse element is unique: *cf* [1ZP].