Definition

A **ring** $(R, *, *')$ is a set R w.r.t. 2 binary operations $*$ & $*'$ defined on R s.t. the following conditions:

1) $(R, *)$ is an abelian group
($*$ is associative, commutative)

2) $(R, *')$ is a semigroup
($*'$ is associative)

3) Distribute Laws hold in R

$(\forall a, b \in R)$ $a *' (b * c) = a *' b * a *' c$

$(b * c) *' a = b *' a * c *' a$

Examples

$(\mathbb{R}, +, \cdot)$ - ring bcs

$(R, +)$ - abelian group

$(R, \cdot)$ - semigroup (commutative)

DLs hold

$(\mathbb{Z}, +, \cdot)$ - ring

$(\mathbb{Q}, +, \cdot)$ - ring