Abstract Algebra

Group

Definition 1. *A set is a **group** iff, given some definition of addition on that set:*

1. *addition is associative,*
2. *there is an additive identity,*
3. *each element has an additive inverse.*
4. *Additionally, the group is **abelian** iff addition is commutative.*

Field

Definition 2. *A set is a **field** iff, given some definition of addition and multiplication on that set:*

1. *addition and multiplication are associative,*
2. *there is an additive and a multiplicative identity,*
3. *each element has an additive inverse,*
4. *each element (other than some "zero") has a multiplicative inverse,*
5. *addition and multiplication are commutative,*
6. *multiplication distributes over addition.*

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