# MATH 120B: Rings and Fields

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### Rings and Fields

#### 1.1 Rings

**Definition 1.1** (Ring). A ring  $\langle R, +, \cdot \rangle$  is a set  $\mathcal{R}$  together with two binary operations + and  $\cdot$  such that

- 1.  $\langle R, + \rangle$  is an abelian group
- 2. · is associative
- 3. The left and right distributivity laws hold
  - (a)  $\forall a, b, c \in R \rightarrow c \cdot (a+b) = ca + cb$
  - (b)  $\forall a, b, c \in R \rightarrow (a+b) \cdot c = ac + bc$

## **List of Theorems**

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1.1 Definition (Ring)
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