

# Modern Algebra

## Definitions and Basic Properties of a Ring

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The most general algebraic structure with two binary operations is called a *ring*.

### **Definition**

A **ring**  $\langle R, +, \cdot \rangle$  is a set  $R$  together with two binary operations  $+$  and  $\cdot$ , which we call *addition* and *multiplication* defined on  $R$  such that the following axioms are satisfied  $a, b \in R$ :

1.  $\langle R, +, \cdot \rangle$  is an abelian group under addition.
  - a. The book.
  - b. The light.