



Why

We generalize the algebraic structure of addition and multiplication over the rationals.

Definition

A *field* is two algebras over the same ground set with: (1) both algebras are commutative groups (2) the operation of the second algebra distributes over the operation of the first algebra.

We call the operation of the first algebra *field addition*. We call the operation of the second algebra *field multiplication*.

Notation

We tend to denote an arbitrary field by \mathbf{F} , a mnemonic for “field.”

1 Examples

Of course, \mathbf{Q} with the usual addition (see [Rational Sums](#)) and multiplication (see [Rational Products](#)) and the inverse elements (see [Rational Additive Inverse](#)) and [Rational Multiplicative Inverses](#)) is a field.

Proposition 1. *The set of rational numbers with rational addition and multiplication is a field.*

