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## 1 Fields

### 1.1 Fields

#### 1.1.1 Fields

A field is a ring where the multiplication function has an inverse.

The integers, addition and multiplication form a ring, but not a group.

The rational numbers (except 0), addition and multiplication form a field (and a ring).

The real numbers and complex numbers also form fields.

#### 1.1.2 Finite (Galois) fields

Finite number of elements.

##### 1.1.2.1 Integers mod $p$ field

##### 1.1.2.2 Characteristic of a field