prime subfield

Canonical name	PrimeSubfield
Date of creation	2013-03-22 12:37:47
Last modified on	2013-03-22 12:37:47
Owner	djao (24)
Last modified by	djao (24)
Numerical id	4
Author	djao (24)
Entry type	Definition
Classification	msc 12E99

The *prime subfield* of a field F is the intersection of all subfields of F, or equivalently the smallest subfield of F. It can also be constructed by taking the quotient field of the additive subgroup of F generated by the multiplicative identity 1.

If F has characteristic p where $p > 0$ is a prime, then the prime subfield of F is isomorphic to the field $\mathbb{Z}/p\mathbb{Z}$ of integers mod p. When F has characteristic zero, the prime subfield of F is isomorphic to the field $\mathbb{Q}$ of rational numbers.