

- Answer to questions:

- The splitting field of the polynomial $X^q - X$ over the field \mathbb{F}_p when q is a power of p .
- What is a Galois group? Automorphisms of E/F when $E = F(\alpha_1, \dots, \alpha_n)$.

- The Galois group of a separable polynomial of degree n as a subgroup of \mathfrak{S}_n (continued).

Example: quadratic polynomial over a field of characteristic $\neq 2$. Galois group of the splitting field, Galois group of the polynomial.

The Galois group of the polynomial $(X^2 - 2)(X^2 - 3)$ over \mathbb{Q} .

Transitive and non transitive subgroups of \mathfrak{S}_n .

- Solvability of equations. Definition: polynomial solvable in radicals over a field F . Theorem 3.27 (Galois). Solvable groups. Abelian, finite p groups are solvable. Non solvable groups: \mathfrak{S}_n (symmetric group) and \mathfrak{A}_n (alternating group) for $n \geq 5$. A finite group of order < 60 is solvable.

Reference: J.S. Milne, Fields and Galois Theory Version 4.52 March 17, 2017.