A Sample Note on Galois Correspondence

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1 Preliminaries

Let L/K be a finite Galois extension and $G = \mathrm{Gal}(L/K)$.

Definition 1.1. For a subgroup $H \le G$, the *fixed field* is $L^H = \{x \in L \mid \sigma(x) = x \text{ for all } \sigma \in H\}$.

Lemma 1.2. *For every subgroup $H \le G$ we have $[L : L^H] = |H|$.*

Proof. This is Artin's theorem; see Section 2. □

2 The correspondence

Theorem 2.1 (Fundamental theorem)**.** *The maps $E \mapsto \mathrm{Gal}(L/E)$ and $H \mapsto L^H$ are mutually inverse, inclusion-reversing bijections between intermediate fields $K \subset E \subset L$ and subgroups of G.*

By Definition 1.1 and Lemma 1.2, the degree of L^H over K equals $[G : H]$.

$$\sum_{k=0}^{n} \binom{n}{k} x^k y^{n-k} = (x+y)^n, \qquad \prod_{p} \frac{1}{1-p^{-s}} = \sum_{n=1}^{\infty} \frac{1}{n^s} = \zeta(s) \quad (\mathrm{Re}\, s > 1).$$

3 More text

Theorem 2.1 is the main result. Page two contains the statement, and the table of contents links here.

4 The last page

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