

Nepal Algebra Project(NAP)
Fields and Galois Theory “multiple hands” course in Nepal
Central Department of Mathematics
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NAP: Module -2, Lecture -3, Thursday, 18 May, 2017

- Definition of ‘multiple roots’. Trivial examples, e.g., $X^2 - 2X + 1$, irreducible example $X^2 - a$ in characteristic 2. Criterion for multiple roots in terms of derivative. “Permanence of GCD” under extensions. No multiple roots $\iff f$ and f' are relatively prime. Importance of “ $\text{char}(F) = 0$ ”. Milne, Proposition 2.12.
- Field homomorphisms are one-to-one. Def of automorphism. $\text{Aut}(K/f)$ as a group. When K/F is finite, every F -hom $K \rightarrow K$ is an automorphism. Mentioned without proof that $\#\text{Aut}\mathbb{C} = 2^{2^{\aleph_0}}$. Returned to results on $\#$ of autos/isos in Section 2.