

Nepal Algebra Project(NAP)
Central Department of Mathematics
Tribhuvan University, Kirtipur, Kathmandu, Nepal
Fields and Galois Theory

Course Instructor: Prof. Nick Gill

Summary of NAP: Module 3, Lecture 2

- Review of fundamental concepts from group theory by discussing semi-direct products. We considered a range of examples (and a number of supplementary exercises were given during the lecture). We noted that one way to distinguish between D_4 and Q_8 is that the former is a semidirect product $C_4 \rtimes C_2$, while the latter is not.
- We then applied our knowledge of semidirect products to a careful study of Example 3.22 of Milne: here we considered the field extension E/\mathbb{Q} where E is the splitting field of $X^5 - 2$. We followed Milne's treatment in calculating the Galois group G of this extension, and considered how to describe this group accurately as a semidirect product. We also extended Milne's treatment by considering the subgroups of G of order 2 and 10, and students were asked to calculate the fixed fields of (some of) these groups as a supplementary exercise.