

Math 250A: Reading and Concepts for 10/10-10/19

General reading note: We are now venturing into Galois theory, which is most of Chapter VI in Lang (although we will organize things a bit differently in lecture). The good news is that I won't be assuming that you know much from previous classes in this section, except for familiarity with fields/field extensions as described in the last reading list. There are no bad news.

The lectures this week will be planned roughly as follows:

- 10/10: Automorphism groups of fields ($\text{Aut}(K)$) and automorphism groups of fields over fields (if K is an extension of F this is denoted by $\text{Aut}(K/F)$) with examples. Beginning talking about L -valued characters for a field L and group G . Reading: a little of VI.1, VI.4 of Lang. Concepts you should know: it might be useful to convince yourself that $\text{Aut}(K)$ is a group and $\text{Aut}(K/F)$ is a subgroup.
- 10/12: Linear independence of distinct L -valued characters, beginning talking about Galois extensions. Reading: VI.4 of Lang (see VI.1 for Lang's definition of a Galois extension).
- 10/15: Galois groups, equivalent definitions of Galois extensions. Reading: VI.1 of Lang.
- 10/17: More on Galois extensions, fundamental theorem of Galois theory (Theorem 1.1 in Lang). Reading: VI.1 of Lang.
- 10/19: (Finishing?) proof of fundamental theorem of Galois theory, some applications. Reading: VI.1, VI.2 of Lang.