

## Math 250A: Reading and Concepts for 10/22-11/2

*General reading note:* We are continuing Galois theory and applications thereof. As before, I am assuming basically nothing except for knowledge of what was covered in class previously as well as the basic group and field concepts listed on previous reading lists.

The lectures this week will be planned roughly as follows:

- 10/22: Finishing off some examples of the Galois correspondence and beginning application of the correspondence to the fundamental theorem of algebra. We will define and prove some things about normal closure. Reading: some of VI.2 (notably Example 5) of Lang.
- 10/24: Fundamental theorem of algebra and proof, starting discussion of solvability of polynomials: we begin with cyclic extensions. Reading: VI.6 of Lang (we won't talk about norm of elements, but will essentially show theorems 6.1/6.3 and 6.2. You're encouraged to read the statement of Theorem 6.4, which we may not have time to get to, but you have all the tools to prove it).
- 10/26: Radical extensions and Galois groups of composite extensions. Reading: parts of VI.1 about composite fields and perhaps VI.7, which doesn't spend much time on radical extensions, of Lang.
- 10/29: Galois' criterion for solvability of polynomials and consequences. Reading: VI.7 of Lang.
- 10/31: Solving (this is what algebra is all about) and calculating Galois groups of cubic and quartic polynomials. Reading: VI.2, example 2 of Lang (not much on quartic extensions in Lang).
- 11/2: Finishing off discussion of quartic polynomials, some impossible geometric constructions. Reading: I couldn't find a section on geometric constructions in Lang.

If time permits we might discuss the methods mentioned in Example 7 and 8 of VI.2 on determining Galois groups.