Study Guide, Exam 2, Math 372

This list is not guaranteed to be complete. Testing center calculators may be used on the exam, which will be November 18-20 in the testing center.

Definitions/Concepts to know:

1. Splitting fields
2. Normal extensions
3. Separable extensions
4. Linear independence of monomorphisms
5. K-monomorphisms
6. Normal closures
7. Fixed fields of automorphisms
8. Fundamental theorem of Galois theory
9. Solvable groups
10. Simple groups
11. Isomorphism theorems
12. Cauchy's theorem
13. Alternating and symmetric groups
14. Solvability by radicals
15. Rings, fields
16. Integral domains, polynomial rings
17. Prime subfields, characteristic of fields
18. Fields of fractions

Examples of problems you should be able to do:

1. Compute the Galois group of a field extension or of a polynomial over a field
2. Compute subgroups of a Galois group and find corresponding fixed fields
3. Find normal subgroups of Galois groups and compute relevant quotient groups
4. Find all intermediate fields of an extension by computing the Galois group
5. Determine whether field extensions are normal
6. Prove that a polynomial is not solvable by radicals

Remember that the learning outcomes for the course state that students "should know all relevant definitions, correct statements of the major theorems (including their hypotheses and limitations), and examples and non-examples of the various concepts. The students should be able to demonstrate their mastery by solving non-trivial problems related to these concepts, and by proving simple (but non-trivial) theorems about the… concepts, related to, but not identical to, statements proven by the text or instructor."