

Study Guide, Exam 1, Math 372

This list is not guaranteed to be complete. Testing center calculators may be used on the exam, which will be October 7-9 in the testing center.

Definitions/Concepts to know:

1. Subfields, subrings of \mathbf{C}
2. Polynomials
3. Fundamental theorem of algebra
4. Euclidean algorithm
5. hcf of polynomials
6. Irreducibility
7. Gauss's lemma
8. Eisenstein's criterion
9. Reduction modulo p
10. Roots of polynomials
11. Field extensions
12. Simple extensions
13. Algebraic extensions
14. Transcendental extensions
15. Minimal polynomial
16. Classification of simple extensions
17. Degree of an extension
18. Tower law
19. Straightedge and compass construction
20. K -automorphisms of L

Examples of problems you should be able to do:

1. Prove that a given polynomial is irreducible
2. Prove that a given set is a subfield of \mathbf{C}
3. Find an hcf of two polynomials
4. Given a set X and a field K , describe the field $K(X)$
5. Find the minimal polynomial for an uncomplicated radical expression
6. Prove that two fields are isomorphic
7. Compute the degree of an extension

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."