REVIEW FOR FINAL
MATH 114

What do you have to know for the final.

Groups. Definitions of a group, a subgroup, a normal subgroups and a quotient. Lagrange's theorem, Isomorphism theorems.Action of G on a set X, Sylow theorems, solvable and simple groups. Fundamental theorem of abelian groups.

Polynomials. Irreducible polynomials, division algorithm, factorization theorem. Eisenstein criterion and other ways to check if a polynomial is irreducible.

Field theory. Field extensions and degree. Algebraic extensions and algebraic numbers. Normal extensions, splitting fields, separable polynomials. Galois group, Galois correspondence between subgroups and subfields. Galois group of a polynomial. Roots of unity and Kummer fields. Finite fields. Natural irrationalities theorem.

Applications. Criterion for solvability in radicals. Polynomials of prime degree and Frobenius group. Finding Galois group for polynomials of degree 3 and 4. Galois group of a general polynomial. Ruler and compass constructions, regular polygons. Calculating Galois group using reduction modulo p.

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