

Algebra Qual Prep: Summer, 2008.

Group Theory

August 4, 2008

1. Structure theory
 - (a) Homomorphism theorems
 - (b) Direct and semi-direct products
 - (c) Fundamental theorem of finitely generated abelian groups
 - (d) Class equation
 - (e) Lagrange's Theorem
 - (f) Sylow Theorems
 - (g) Presentations, generators and relators
2. Groups acting on sets
 - (a) Orbits
 - (b) Quotients
 - (c) Stabilizers
 - (d) Conjugacy classes
3. Examples
 - (a) Cyclic groups
 - (b) Symmetric groups, S_n
 - (c) Alternating groups, A_n
 - (d) Dihedral groups, D_n
 - (e) $GL_n(\mathbb{C})$
 - (f) Quaternions
 - (g) Free (abelian) groups
 - (h) Nilpotent and solvable groups