## **Title**

D. Zack Garza

August 19, 2019

## **Contents**

- Cauchy's Theorem
- Centralizer
- Center of a group
- Characteristic subgroup
- Class Equation
- Commutator subgroup
- Composition series
- Composition series
- Conjugacy Class
- Cosets
- Cycle
- Derived series
- Equivalence relation
- Factor group
- Faithful action
- First Isomorphism Theorem
- Group action
- Index
- Inner automorphism
- Jordan-Holder theorem
- Lagrange's Theorem:  $H \leq G \implies \#H \mid \#G$
- Nilpotent groups
- Normal series
- Normal subgroup
- Normalizer
- Normal Core: For  $H \leq G$ , the largest subgroup of G that is *contained* in H. Given by the intersection of all conjugates of H, i.e.

$$N_G(H) = \bigcap_{g \in G} gHg^{-1}$$

- Orbit
- Orbit-Stabilizer theorem
- Outer automorphism
- Second Isomorphism Theorem

- Semidirect product
- Simple group:
- Solvable group
- Stabilizer
- Subnormal series
- Sylow Theorems
- Sylow p-groups
- Third Isomorphism Theorem
- Transitive group action
- p-groups