

MATH 531: Some topics we covered in Chapters 5–11

- Permutations - notation & operations
- Cycles; the cycle decomposition of a permutation & its uses
- Transpositions; even & odd permutations; the subgroup A_n
- Isomorphism (the relation) of groups; it's an equivalence relation
- Isomorphisms (functions) & homomorphisms
- Properties preserved by isomorphism (Abelian, cyclic, orders of elements)
- Determining whether groups are isomorphic
- Automorphisms, including conjugation
- Cosets & their properties
- Lagrange's Theorem (the order of a subgroup divides the order of the group)
- Applications (groups of prime order, Fermat's Little Theorem, Euler's Theorem)
- Normal subgroups (pp. 172–173): characterizations via cosets & conjugation
- Direct product of groups (pp. 150–154)
- When is a direct product cyclic?
- Fundamental Theorem of finite Abelian groups (pp. 211–213)