

Worksheet 9: Commutator subgroups in examples

$S_n, n \geq 3$

1. What can you say about the parity (even or oddness) of commutators in S_n ?
2. Can you find a 3-cycle as a commutator?
3. Use what you know about conjugacy classes in S_n to find $[S_n, S_n]$.

$D_n, n \geq 3$

1. What elements can you find as commutators?
2. Do you have enough elements for a normal subgroup?
3. What is the quotient isomorphic to?
4. What is $[D_n, D_n]$?

$U_n(\mathbb{F}_p), n \geq 2$

1. Can you find $[U_n(\mathbb{F}_p), U_n(\mathbb{F}_p)]$?