

# Groups and Rings - SF2729

## Homework 5

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**Exercise 1.** Let  $n \geq 1$  and  $S_n$  be the permutation group. Describe all group homomorphisms  $f : S_n \rightarrow Z_3$ .

*Solution.*

**Exercise 2.** Let  $G$  be a finite group. Consider its center  $Z(G) = \{g \in G : ga = ag \forall a \in G\}$ .

**Show that if  $G/Z(G)$  is cyclic, then  $G$  is abelian.**

*Solution.*