

Groups.Know

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1 Group Basics

1.1 Groups

$$\begin{aligned} \text{Group} ::? \sum S : \text{Set} . S \rightarrow S \rightarrow S \\ (G, \cdot) : \text{Group} \\ \Updownarrow \\ \forall a, b, c \in G . (ab)c = a(bc) \\ \exists e \in G : \forall a \in G . ea = ae = a \\ \forall a \in G : \exists a^{-1} \in G . aa^{-1} = a^{-1}a = e \end{aligned}$$

1.2 Subgroups

1.3 Orders and exponents

1.4 Normal Subgroups

1.5 Group Homomorphism

2 Finite Groups

2.1 Cosets and Lagrange theorem

2.2 Cyclic Groups

2.3 Sylow Subgroups

3 Symmetric Groups