

Exercises 8: 3, 4, 7, 18, 40, 43, 46, 47, 49

Exercises 9: 3, 5, 9, 11, 12, 36, 37

Exercises 11: 2, 4, 6, 8

Additional exercises:

1. Prove that the order of the alternating group A_n is $n!/2$.
2. Prove the following statements.
 - (a) Every infinite cyclic group is isomorphic to \mathbb{Z} .
 - (b) Every cyclic group of order $n < \infty$ is isomorphic to \mathbb{Z}_n .
3. Let $(G_1, *)$, (G_2, \star) be groups. Prove that $G_1 \times G_2$ is a group under the operation $(g, h)(a, b) = (g * a, h \star b)$.