

Math 566: Graduate Algebra 1

Homework 1 (Due Thursday, September 1)

Problem 1

Chapter 1, Exercises 1.3, 1.7, 4.2

Problem 2

Chapter 1, Exercise 5.1

Find the order of $(123456)(789)$ and the order of $(12345)(678)$ in S_9 .

Problem 3

Let S be a set closed under an operation $*$. Assume that $*$ is associative on S and suppose S contains a left identity e . Determine whether each of the following statements are true or false. If the statement is true prove it if it is false give a counterexample.

- (a) If every element of S has a right inverse with respect to e , then S is a group.
- (b) If every element of S has a left inverse with respect to e , then S is a group.

Problem 4

Chapter 2, Exercise 2.4

Choose one example from the above exercise that is a subgroup and prove your claim.
Choose one example from the above exercise that is not a subgroup and prove your claim.

Problem 5

Chapter 2, Exercise 4.3, 4.10

Optional problems for additional practice (not to turn in)

Chapter 1, Exercises 1.5, 1.6, 1.12, 4.4

Chapter 2, Exercises 1.1, 2.1, 2.3, 2.5, 2.6, 4.1, 4.4, 4.6, 4.7