

MATH 3360 HOMEWORK ASSIGNMENT 2

DUE ON FRIDAY 31 JANUARY 2020

- (1) Let G be a group. Show that if every element of G is its own inverse, then G is abelian.
- (2) Let $n \in \mathbb{N}$. Show that the set G of $n \times n$ matrixes with determinant ± 1 form a group under matrix multiplication.
- (3) Let $n \in \mathbb{N}$. Show that the set H of $n \times n$ matrices with determinant 1 is a subgroup of the group G from Problem 2. Decide if the set K of $n \times n$ matrices with determinant -1 is also a subgroup of G .
- (4) Let p be a prime. Show that the non-zero elements of the set \mathbb{Z}_p form a group under multiplication. (See Problem 2 on Homework Assignment 1.)
- (5) Compute the center of the group $\text{GL}_2(\mathbb{R})$ of invertible 2×2 matrices under multiplication.