

Assignment 2 - Subgroup and symmetries

- 1 Define subgroup.
- 2 Describe/define the group $GL_2(\mathbb{Z})$ of integer invertible matrices. Give an example of a proper non-trivial subgroup of $GL_2(\mathbb{Z})$.
- 3 Consider a square S in \mathbb{R}^2 with sides of length 1 and with origin as the center. Define the set of symmetries of a square to be the set of those rigid plane motions f such that f maps S bijectively onto itself. Show that the symmetries of S forms a subgroup of the group of rigid plane motions.
- 4 Explicitly describe the symmetry group of S in the problem above.
- 5 Explicitly describe the symmetry group of an equilateral triangle in \mathbb{R}^2 with origin as center.