

# Algebraic and Geometric Methods in Engineering and Physics

## Homework 6

*Due on October 25*

1. Show that the set

$$K = \{e, (12)(34), (13)(24), (14)(23)\}$$

is a normal subgroup of  $S_4$  (the so-called **Klein group**). What are the corresponding symmetries of the tetrahedron?

2. How many different colorings of a tetrahedron are there, if each face can be painted with any one of  $n$  possible colors?