

# Homework 11

Deadline: Tuesday, December 30 at 14:00.

*Please submit your solutions either on paper at the beginning of the practicals or as a pdf-file in <https://owl.mff.cuni.cz/> . Everything that is not immediately obvious needs to be proved or quoted from lecture notes.*

*Note that you should solve only one of the following questions below.*

1. In the symmetric group  $(\S_9, \circ, ^{-1}, \text{id})$  find the order of the subgroup  $\langle (1\ 2)(3\ 4\ 5)(6\ 7\ 8\ 9) \rangle_{\S_9}$ , the index  $[\S_9 : \langle (1\ 2)(3\ 4\ 5)(6\ 7\ 8\ 9) \rangle_{\S_9}]$ , and all elements of  $\S_9$  of the order 11.
2. Let  $G$  be a finite group. Prove that there exists a generating set of size at most  $\log_2(|G|)$ .