

Algebra 1 (2011)-Aalborg University

Lecture 21, November 30th

21st Lecture: Wednesday November 30th, 8:15-12:00 at room G5-112.

- 8:15-8:45 Repetition. Symmetric group and bubble sort (pages 78–83).
- 8:45-10:45 Work in groups. Exercises from [Lau], 2.11 (page 104): A, 38, B, C, 39 (hint: use exercise 15(iii)), 43 (preparation for next lecture), D.

Exercise A: Write a permutation that is not a k -cycle for any k ?

Exercise B: Compute the order of

$$\sigma = \begin{pmatrix} 1 & 2 & 3 & 4 & 5 & 6 & 7 & 8 & 9 & 10 & 11 & 12 & 13 \\ 5 & 12 & 2 & 1 & 9 & 11 & 4 & 3 & 7 & 10 & 13 & 8 & 6 \end{pmatrix}$$

(Hint: write σ as a product of pairwise disjoint cycles).

Exercise C: Compute the order of the permutation $(1\ 2\ 3\ 4)(5\ 6\ 7)(8\ 9)$. Compute the order of the permutation $(1\ 2\ 3\ 4)(2\ 6\ 7)(8\ 9)$. (Hint: the first one is easy. We have to do some computations for the second one)

Exercise D: Write all the elements of S_4 , each factored into disjoint cycles.

- 10:45-12:00 Lecture: Simple transpositions. The alternating group. Simple groups (pages 83–88).

Best regards,

Diego