

Algebra 2010-Aalborg University

9th Lecture: Thursday October 14th, 8:15-12:00 at room G5-112.

- 8:15-8:45 Repetition from last lecture. Cyclic groups. Euler's theorem (revisited). Product groups (pages 74–77)
- 8:45-10:45 Work in groups. Exercises from [Lau], 2.11 (page 104)+4 other exercises: 29, 31, exercise A, 28, exercise B, exercise C, exercise D, some exercises from previous lectures that you did not solved yet.

Exercise A: How many elements are there of order 4 in $\mathbb{Z}/28\mathbb{Z}$? (answer this without computing them)?, Write down all the elements of order 4 in $\mathbb{Z}/28\mathbb{Z}$. How many subgroups are there of order 4 in $\mathbb{Z}/28\mathbb{Z}$?. Write down the subgroups of order 4 in $\mathbb{Z}/28\mathbb{Z}$.

Exercise B: How many elements of $(\mathbb{Z}/13\mathbb{Z})^*$ are generators of $(\mathbb{Z}/13\mathbb{Z})^*$? (hint: you do not need to compute them).

Exercise C: Prove that S_3 and D_3 are isomorphic (see page 68).

Exercise D: Prove that L and $O_2(\mathbb{R})$ are isomorphic (see page 69).

- 10:45-12:00 Lecture: The Chinese remainder theorem for groups. Symmetric group. Cycles. Simple transpositions and Bubble sort (pages 77–83).

Best regards,

Diego Ruano