

Algebra 1 (2011)-Aalborg University

Lecture 16, November 10th

16th Lecture: Thursday November 10th, 12:30-16:15 at room G5-112.

I will not be present during this lecture. The group G3-114 will be responsible for the lecture.

- 12:30-13:00 Repetition from last lecture. Group G3-114 will give this lecture. The topics are: Order of a group element, cyclic groups (pages 72–76).
- 13:00-15:00 Work in groups. Exercises from [Lau], 2.11 (page 104): 31, A, B, C, 29, 30, 34.

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: Let G be the group $\{1, -1, i, -i\} \subset \mathbb{C}$. Prove that G is cyclic. Which are the generators of G ?

Each group can write their solution for exercises 31, B, C and 29 and leave it in my mailbox (just one set of exercises per group).

- 15:00-16:15 Lecture: This part will consist of self-study in the group rooms or in the lecture room G5-112 followed by a common discussion in the lecture room directed by group G3-114. The topic is cyclic groups and Groups and numbers (pages 75–78). At the end of the lecture, group G3-114 will orientate the teacher, by e-mail, about the concrete successes and difficulties during the lecture.

Best regards,

Diego