

Algebra 2 (2013)-Aalborg University

Lecture 12, March 14th

12th Lecture (C): Thursday March 14th, 8:15-12:00. I will not be present during this lecture, it is self-study.

- Self-study: Repetition from last lectures (pages 132–135) + Quadratic residues, The Euclidean algorithm strikes again, Prime numbers congruent to 1 modulo 4. Fermat's last theorem (pages 36-38 and 135-138). There are some slides to guide you.
- Work in groups: Exercises from [Lau], 3.6 (page 138): 37, 32, 38, A, 34, 35, B, 36, 39, 31, 33, 28, C, 29, 24, D, 23, E, F, 16, 13, 15, 8 (i and ii), 9, 10, 26.

Exercise A: Solve exercise 1.52

Exercise B: Solve exercises 1.51 and 1.50

Exercise C: Prove that $\mathbb{Z}[i]$ is a Euclidean domain (see pages 132 and 133).

Exercise D: Let R be an integral domain. Prove that for $a, b \in R$: $ab \in R^*$ if and only if $a, b \in R^*$.

Exercise E Check that the relation defined in page 123 is an equivalent relation and the two operations are well defined.

Exercise F: Let R be a ring. Prove that R is a field if and only if $\langle 0 \rangle$ is a maximal ideal.

You can ask me by email.

Best regards,

Diego