Algebra 2 (2012)-Aalborg University
Lecture 11, March 13th

11th Lecture (A): Tuesday March 14th, 8:15-12:00 at room G5-112.

- 8:15-10:00 Repetition from last lectures (pages 132–135). Lecture: Quadratic residues, The Euclidean algorithm strikes again, Prime numbers congruent to 1 modulo 4. Fermat's last theorem (pages 36-38 and 135-138)
- 8:45-10:45 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 exercise 1.51, 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.

Best regards,

Diego