Algebra 1 (2012)-Aalborg University
Lecture 10, October 9th

10th Lecture: Tuesday October 9th, 8:15-12:00 at room G5-112.

- 8:15-8:45 Repetition from last lecture. More examples of groups. Subgroups and cosets (pages 57-64).
- 8:45-10:45 Work in groups. Exercises from [Lau], 2.11 (page 104): A, B, C, 11, 10, D, 12 (only the first question), E, F, 15 (only (i) and (ii)).

  Exercise A: Watch this video: http://www.youtube.com/watch?v=CPRnUPH8sME and discuss Wiles' "experience of doing mathematics". Do you agree with him?, What is your experience?

  Exercise B: Prove that the two definitions in Definition 2.2.1 (page 61) are equivalent.

  Exercise C: Let $H \subset G$ be a subgroup of G. Can the neutral element of H be different from the neutral element of G?

  Exercise D: Let $G = \mathbb{Z}/6\mathbb{Z}$ and $H = \{[0], [3]\}$, compute G/H.

  Exercise E: Let H be a finite nonempty subset of a group G. Prove that H is a subgroup of G if and only if H is closed.

  Exercise F: Let H and K be subgroups of a group G. Show that $H \cap K$ is a subgroup of G.
- 10:45-12:00 Lecture: Normal subgroups. Quotient groups of the integers. The multiplicative group of prime residue classes (pages 64–67).

Best regards,

Diego

PS: The previous video is part of the film Fermat's Last Theorem: The Documentary, directed by Simon Singh.