Writing Assignment 1

Due Tuesday, April 29 in class

Recommended length: 1 - 2 pages.
Recommended format: typed.

Let G be a group. The *commutator subgroup* G' of G is

$$G' = \langle xyx^{-1}y^{-1} \quad \text{such that} \quad x, y \in G \rangle$$

The goal of this assigment is to prove the following theorem about commutator subgroups.

Theorem 1. *If N is a normal subgroup of G, then G/N is abelian if and only if $G' \leq N$.*

In doing this you should

- Briefly introduce the topic
- Given the necessary definitions and results you will need for the theorem. You do not need to prove the results that are in the book, but you should restate the definitions and results that you need in your paper, in order to make it self contained. You may assume that the reader has read up through section 2.1 in the textbook. For example, you will need to give a definition of *normal subgroup*, but not of *abelian group*.
- State and prove the theorem.

Remember that this is a writing assignment, so the main focus should be on clearly communicating the ideas in the proof. Take advantage of the writing TA (Bob Hough, : rdhough@math.stanford.edu) for asking questions or having him look at rough drafts. If you want Bob to comment on a rough draft, turn it in to him at least a week ahead of the due date.