

- (1) Let F be the free group on two generators and let F' be its commutator subgroup. Find a set of free generators for F' by considering the covering space of the graph $S^1 \vee S^1$ corresponding to F' .
- (2) If F is a finitely generated free group and N is a nontrivial normal subgroup of infinite index. Show, using covering spaces, that N is not finitely generated.