

Geometric Group Theory

Problem Sheet 0

1. Show that a subgroup of index 2 is normal.
2. Let A, B be finite index subgroups of G . Show that $A \cap B$ is a finite index subgroup of G .
3. Let G be a finitely generated group and let H be a subgroup of G of finite index. Show that H is finitely generated.
4. Show that if G is a finitely generated group such that every (non-trivial) element of G has order 2 then G is finite.
5. Let H be a finite index subgroup of G . Show that there is a normal finite index subgroup N of G , such that $N \subset H$.
6. Let G be a finitely generated group. Show that G has finitely many subgroups of index n . (*hint*: use the previous exercise).