Keywords, statements, definitions

03.03.

1. **Schur's theorem**: If the index of the center of a group is finite, then the commutator subgroup is finite.
   steps of the proof:
   - Finite index subgroup of a finitely generated group is finitely generated.
   - If the center is of finite index, then the commutator subgroup is finitely generated.
   - $G' \cap Z(G)$ is a finite index subgroup of G' (so it is also finitely generated)
   - The exponent of $G' \cap Z(G)$ is finite.
2. e is the **exponent** of a group G if $g^e = 1$ for every $g \in G$ and for every $f \leq e$ there is $g_f \in G$ such that $g_f^f \neq 1$.
3. **normal series:** Let G be a group
   $$N_0 \leq N_1 \leq \ldots \leq N_n = G$$
   is a (sub)normal series of G if $N_i \trianglelefteq N_{i+1}$ for $i = 0, \ldots, n-1$.
4. **composition series:** Let G be a group
   $$N_0 \leq N_1 \leq \ldots \leq N_n = G$$
   is a composition series of G if $N_i \trianglelefteq N_{i+1}$ for $i = 0, \ldots, n-1$ and the factors n_{i+1}/N_i are simple.