

Name: _____

1. Let $U, V \leq G$ be subgroups of a group G .
Prove that if U and V have finite index
so does $U \cap V$.
2. Prove there is no simple group of
order $132 = 2^2 \cdot 3 \cdot 11$.
3. Let G be a p -group (p a prime).
Let $1 \neq H \trianglelefteq G$ be a non-trivial
normal subgroup of G . Prove that
 $Z(G) \cap H$ is non-trivial.
4. Let G be a finite group, $P, P^* \leq G$ two
distinct p -Sylow subgroups for some prime
 p . Let
 $H := \langle P, P^* \rangle$
Prove there exists $h \in H$ such that
 $P^* = h P h^{-1}$.

I pledge my honor that this work is entirely mine
done with no consultation with other people, websites
or texts (other than the class notes & Milne's notes).

Signature: _____

Date: _____