Homework-5

1. Let G be a group of order pqr where p, q, r are primes. Show that G is not a simple group.

2. Let G be a group of order p^2q^2, where p, q are primes. Show that G is not a simple group.

3. Let P be a Sylow-p subgroup of a finite group G. Show that $N_G(N_G(P)) = N_G(P)$.

4. Let $H \subseteq G$ with G finite and suppose $P \in Syl_p(H)$. If $N_G(P) \subseteq H$, show that $P \in Syl_p(G)$.