1. Page 164 #2, 10, 15, 16

2. Let $P$ be a finite $p$-group. If $H \leq P$, prove that $H \leq N_G(H)$.

3. (6920 students) Let $P$ be a finite $p$-group, $N \leq P$ a nontrivial normal subgroup of $P$. Then $N \cap Z(P) \neq \{1\}$. From this conclude that if $P$ is a finite $p$-group, then $Z(P) \neq \{1\}$.
   (Hint: Let $P$ act on $N$ by conjugation.)

4. Page 170 #7, 9, 10, 13, 16, 25

5. (6920 students) If $G$ is a group such that $|G| = 300$, prove that $G$ is not simple.
   (Hint: Let $G$ act on the left cosets of an appropriate normalizer.)