AAL, Ex. 5.

1. Calculate $\gamma_i(D_n)$.
2. Calculate the commutator subgroup of S_n.
3. Prove that the commutator $[\pi, \sigma]$ is a 3-cycle if $|supp(\pi) \cap supp(\sigma)| = 1$.
4. Show that the 3-cycles generate A_n.
5. Let G be a group of order pq, where p and q are primes. Prove that G is solvable.
6. Show that a subgroup of a nilpotent group is maximal if and only if it has prime index.