

Homework # 3- Due Tuesday January 24, Assigned Tuesday January 17

0. Read p.47-59
1. Definitions: permutation, transposition, odd permutation, even permutation, cycle
2. Exercises 3-8, 3-9, 3-10, 3-14
3. Prove that every *column* in the Cayley table of a group contains each element of the group once and only once.
4. Let G be a group in which every element $g \in G$ has the property that $g^2 = e$. Prove that G is abelian. (Hint: Let $a, b \in G$ and consider $(ab)^2$).
5. Let G be a finite group. Show that for any $g \in G$ there exists $n > 0$ such that $g^n = e$. (Hint: Consider $e, g, g^2, g^3, \dots, g^m$ where $m = |G|$ and apply the cancellation laws.