Homework 6
due February 28, 2014

1. Determine the character table for D_6.

2.(a) Determine the character table for the groups C_5 and D_5.

(b) Decompose the restriction of each irreducible character of D_5 into irreducible characters of C_5.

3. (Artin 10.6.2) Let ρ be the permutation representation associated to the operation of D_3 on itself by conjugation. Decompose the character of ρ into irreducible characters.

4. (Artin 10.6.5) The symmetric group S_n operates on $\mathbb{C}^n$ by permuting the coordinates. Decompose this representation explicitly into irreducible representations.

5. (Artin 10.7.4) Let ρ be a representation of G and let C be a conjugacy class in G. Show that the linear operator $T = \sum_{g \in C} \rho_g$ is G-invariant.