Homework 1
due January 16, 2015 for presentation in class

1. Let ρ be a representation of a group G. Show that $\det \circ \rho$ is a one-dimensional representation.

2. Prove that the only one-dimensional representations of the symmetric group S_5 are the trivial representation defined by $\rho(g) = 1$ for all $g \in S_5$ and the sign representation.

3. Write down all matrices for the regular representation of the cyclic group $C_4 = \{1, g, g^2, g^3\}$.

4. Determine all irreducible representations of a cyclic group C_n.