PROBLEM SET # 2
MATH 252

Due September 16.

In this problem set the field is algebraically closed and has zero characteristic, G is finite and representations are finite-dimensional.

1. Show that the statement of Problem 3 in the first problem set is correct under above assumptions.

2. Let $\rho : G \to \mathrm{GL}\,(V)$ be a representation. Show that each irreducible subrepresentation of V has multiplicity 1 iff $\mathrm{End}_G\, V$ is a commutative ring.

3. Let G be the subgroup of quaternions of 8 elements, that contains $\pm 1, \pm i, \pm j, \pm k$ with relations $i^2 = j^2 = k^2 = -1$, $ij = k$, $jk = i$, $ki = j$, $ij = -ji$, $ik = -ki$, $jk = -kj$. Classify irreducible representations of G over $\mathbb{C}$.

Date: September 8, 2005.