Problem 22

Using the orthogonality relations of matrix elements of irreps, show that

$$\int_G \chi_\mu(g)\chi_\nu(g^{-1}h)dg = \frac{\delta_{\mu\nu}}{n_\mu}\chi_\nu(h)$$

Problem 23 [1]

Perform explicit isotypic decomposition of the permutation representation of S_3 on $\mathbb{R}^3$ using projection operators.

[1] pp.220-221 of [GM]