P26. show $\int_G \chi_\mu(g)\chi_\nu(g^{-1}h)\,dg = \frac{\delta_{\mu\nu}}{n_\mu}\chi_\nu(h)$

$$LHS = \int_G \sum_i M^\mu_{ii}(g) \sum_j \left[\sum_k M^\nu_{jk}(g^{-1}) M^\nu_{kj}(h)\right] dg$$

$$= \sum_{ijk} M^\nu_{kj}(h) \int_G M^\mu_{ii}(g)\, \overline{M^\nu_{kj}}(g)\, dg$$

$$= \sum_{ijk} M^\nu_{kj}(h) \frac{1}{n_\mu} \delta_{\mu\nu}\delta_{ik}\delta_{ij}$$

$$= \frac{\delta_{\mu\nu}}{n_\mu} \sum_i M^\nu_{ii}(h) = \frac{\delta_{\mu\nu}}{n_\mu}\chi_\nu(h)$$

P27 see Moore's lecture notes.