Definition

Suppose G is a finite group with identity 1 and suppose V is a vector space over the field $\mathbf{C}$ of complex numbers. A *linear representation* $\rho : G \to GL(V)$ of G in V is a group homomorphism from G to the general linear group $GL(V)$. Given ρ, we call V a *representation space* (or *representation*) of G

Suppose V has finite dimension n. In this case, we call n the *degree* of the representation ρ. Given a basis $e_1, \ldots, e_n$ of V,