Navarro, Gabriel

Irreducible restriction and zeros of characters. (English) Zbl 0967.20006

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It is a long known fact (by Burnside, around 1900) that an irreducible complex character χ of a finite group G admits some element $g \in G$ satisfying $\chi(g) = 0$ if and only if $\chi(1) > 1$.

In this very remarkable note, the author proves the following extension to Burnside's result. Theorem A. Suppose N is a normal subgroup of G. Let $\chi \in \mathrm{Irr}(G)$. Then χ_N is not irreducible if and only if $\chi(t) = 0$ for all t contained in some specific coset of N in G.

As corollaries we have: B. If N is normal in G and G/N a π-group, and if $\chi \in \mathrm{Irr}(G)$ with $\chi(s)$ not zero on the π-elements s of G, then χ_N is irreducible. C. If $G = HN$, $H \leq G$, N normal in G, $\chi \in \mathrm{Irr}(G)$, then χ_N is irreducible if $\chi(h) \neq 0$ whenever $h \in H$.

As to the proof, use has been made of so-called character-triple-isomorphisms.

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