RECOGNIZE SOME STRUCTURAL PROPERTIES OF A FINITE GROUP FROM THE ORDERS OF ITS ELEMENTS

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Let G be a periodic group. The problem of obtaining information about the structure of G by looking at the orders of its elements has been considered by many authors, from many different points of view.

In this talk we consider a finite group G, and we study the function on the element orders of G defined by

$$\psi(G) = \sum_{x \in G} o(x),$$

where $o(x)$ is the order of the element x.

H. Amiri, J. Amiri and M. Isaacs proved that if G has order n and C_n denotes the cyclic group of order n, then

$$\psi(G) \leq \psi(C_n),$$

and

$$\psi(G) = \psi(C_n) \quad \text{if and only if} \quad G \simeq C_n.$$

We discuss some results concerning the structure of the group G assuming some inequalities involving $\psi(G)$.

Some other functions on the orders of the elements of a finite group G have been recently investigated by M. Garonzi and M. Patassini

References

[1] H. Amiri, S.M.J. Amiri and I.M. Isaacs, *Sums of element orders in finite groups*, Comm. Algebra **37** (2009), 2978-2980.

[2] M. Garonzi and M. Patassini, *Inequalities detecting structural proprieties of a finite group*, arXiv:1503.00355v2 [math.GR] 26 december 2015.

[3] M. Herzog, P. Longobardi and M. Maj, *On a function defined on the element orders of a finite group* , in preparation.

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[*] Joint work with Marcel Herzog and Patrizia Longobardi