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DERIVATIVE π-LENGTH OF π-SOLVABLE GROUPS, THE ORDER OF COFACTORS IS SQUARE-FREE

D. V. Gritsuk
Brest State A. S. Pushkin University (Brest, Belarus)
PhD in Physics and Mathematics, Assistant professor

Only finite groups are considered. All designations and definitions used correspond to [1, 2].

A number of subgroups

$$1 = G_0 \subseteq G_1 \subseteq G_2 \subseteq \cdots \subseteq G_m = G \qquad (1)$$

is called subnormal if for any i the subgroup G_i is normal in G_{i+1}. A group G is called π-solvable if it has a subnormal series (1), each factor of which is either a π-group or a π'-group.

Recall that the cofactor of a subgroup H of a group G is the factor group $H/\mathrm{Core}_G H$, where $\mathrm{Core}_G H$ is the core of the subgroup H в группе G, т.е. наибольшая нормальная подгруппа в G, содержащаяся в H. В in the group G, i.e. the largest normal subgroup of G contained in H. In what follows, the cofactor of a subgroup Hin a group G will be denoted by $\mathrm{Core}_G H$.

In [3], the structure of a group with cyclic cofactors of primary subgroups was studied. In particular, it has been proven that the p-length of such groups does not exceed 1 for all primes p. The structure of solvable groups with bicyclic cofactors of primary subgroups is given in [4].

A number n is said to be free of mth powers if p^m does not divide n for all primes p. When $m = 2$ they say that n is free from squares, when $m = 3$ – from cubes.

The following theorem has been proven.

Theorem. If the cofactor of an arbitrary π-subgroup X of a π-soluble group G is square-free, then $\mathrm{l}_\pi^{\mathrm{a}}(\mathrm{G}/\Phi(\mathrm{G})) \leq 4$.

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