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On overgroups of regular abelian p -groups

Edward Dobson

Abstract

Let G be a transitive group of odd prime-power degree whose Sylow p -subgroup P is abelian of rank t . We show that if $p > 2^{t-1}$, then G has a normal subgroup that is a direct product of t permutation groups of smaller degree that are either cyclic or doubly-transitive simple groups. As a consequence, we determine the full automorphism group of a Cayley digraph of an abelian group with rank two such that the Sylow p -subgroup of the full automorphism group is abelian.

Keywords: Cayley graph, abelian group, regular group, p -group

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O nadgrupah regularnih Abelovih p -grup

Povzetek

Naj bo G tranzitivna grupa, katere stopnja je potenca lihega praštevila in katere p -podgrupa Sylowa P je Abelova ranga t . Najprej pokažemo, da če je $p > 2^{t-1}$, potem ima G edinko, ki je direkten produkt t permutacijskih grup manjše stopnje, ki so bodisi ciklične bodisi dvojno-tranzitivne enostavne grupe, potem pa na osnovi tega rezultata določimo polno grupo avtomorfizmov Cayleyega digrafa Abelove grupe ranga dva, pri kateri je p -podgrupa Sylowa polne grupe avtomorfizmov Abelova.

Ključne besede: Cayleyev graf, Abelova grupa, regularna grupa, p -grupa.