

Cayley graphs of more than one abelian group*

Ted Dobson[†] 

*IAM, University of Primorska, Muzejski trg 2, 6000 Koper, Slovenia, and
FAMNIT, University of Primorska, Glagoljaška 8, 6000 Koper, Slovenia*

Joy Morris[‡] 

*Department of Mathematics and Computer Science,
University of Lethbridge, Lethbridge, AB. T1K 3M4, Canada*

Received 21 January 2020, accepted 14 December 2020, published online 11 October 2021

Abstract

We show that for certain integers n , the problem of whether or not a Cayley digraph Γ of \mathbb{Z}_n is also isomorphic to a Cayley digraph of some other abelian group G of order n reduces to the question of whether or not a natural subgroup of the full automorphism group contains more than one regular abelian group up to isomorphism (as opposed to the full automorphism group). A necessary and sufficient condition is then given for such circulants to be isomorphic to Cayley digraphs of more than one abelian group, and an easy-to-check necessary condition is provided.

Keywords: Cayley graph, circulant graph, group.

Math. Subj. Class.: 05C25, 20B05

*The authors thank the anonymous referee for helpful comments and suggestions.

[†]Corresponding author. This work is supported in part by the Slovenian Research Agency (research program P1-0285 and research projects N1-0062, J1-9108, J1-1695, N1-0140, N1-0160).

[‡]This work was supported by the Natural Science and Engineering Research Council of Canada (grant RGPIN-2011-238552).

E-mail addresses: ted.dobson@upr.si (Ted Dobson), joy.morris@uleth.ca (Joy Morris)



Cayleyjevi grafi več kot ene abelske grupe*

Ted Dobson[†] 

*IAM, University of Primorska, Muzejski trg 2, 6000 Koper, Slovenia, and
FAMNIT, University of Primorska, Glagoljaška 8, 6000 Koper, Slovenia*

Joy Morris[‡] 

*Department of Mathematics and Computer Science,
University of Lethbridge, Lethbridge, AB. T1K 3M4, Canada*

Prejeto 21. januarja 2020, sprejeto 14. decembra 2020, objavljeno na spletu 11. oktobra 2021

Povzetek

Pokažemo, da se, za določena cela števila n , problem: ali je Cayleyjev digraf Γ grupe \mathbb{Z}_n izomorfen tudi Cayleyjevemu digrafu kakšne druge abelske grupe G reda n , prevede na vprašanje: ali kakšna naravna podgrupa polne grupe avtomorfizmov vsebuje več kot eno regularno abelsko grupo do izomorfizma natančno (v nasprotju s polno grupo avtomorfizmov, za katero to ne velja). Potem predstavimo potreben in zadosten pogoj za to, da so takšni cirkulanti izomorfni Cayleyjevim digrafom več kot ene abelske grupe in predstavimo tudi lahko preverljiv potreben pogoj.

Ključne besede: Cayleyjev graf, cirkulantni graf, grupa.

Math. Subj. Class.: 05C25, 20B05

*Avtorja se zahvaljujeta anonimnemu recenzentu za koristne pripombe in predloge.

[†]Kontaktni avtor. To delo je delno podprto s strani Javne agencije za raziskovalno dejavnost Republike Slovenije (raziskovalni program P1-0285 in raziskovalni projekti N1-0062, J1-9108, J1-1695, N1-0140, N1-0160).

[‡]To delo je bilo podprto s strani Natural Science and Engineering Research Council of Canada (nepovratna sredstva RGPIN-2011-238552).

E-poštna naslova: ted.dobson@upr.si (Ted Dobson), joy.morris@uleth.ca (Joy Morris)