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## Isomorphisms of generalized Cayley graphs\*

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**Abstract:** In this paper, we investigate the isomorphism problems of the generalized Cayley graphs, which are generalizations of the traditional Cayley graphs. We find that there are two types of natural isomorphisms for the generalized Cayley graphs. We also study the GCI-groups among the generalized Cayley graphs, and the Cayley regressions of some groups. We mainly showed that, for an odd prime power  $n$ ,  $Z_{2n}$  (resp.  $D_{2n}$ ) is a restricted GCI-group if  $D_{2n}$  (resp.  $Z_{2n}$ ) is a CI-group. We also obtain that the cyclic group of order  $2^n$  is a 4-quasi-Cayley regression if and only if  $n = 3$ .

**Keywords:** Generalized Cayley graph, natural isomorphism, GCI-group, Cayley regression.

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## Izomorfizmi posplošenih Cayleyevih grafov\*

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**Povzetek:** V tem članku raziskujemo probleme izomorfizmov posplošenih Cayleyjevih grafov, ki predstavljajo posplošitve tradicionalnih Cayleyjevih grafov. Ugotovimo, da obstajata dve vrsti naravnih izomorfizmov posplošenih Cayleyjevih grafov. Raziskujemo tudi GCI-grupe posplošenih Cayleyjevih grafov in Cayleyjeve regresije nekaterih grup. Predvsem pokažemo, da je za potenco lihega praštevila  $n$  grupa  $Z_{2n}$  (oz.  $D_{2n}$ ) zožena GCI-grupa, če je  $D_{2n}$  (oz.  $Z_{2n}$ ) CI-grupa. Pokažemo tudi, da je ciklična grupa reda  $2^n$  4-kvazi-Cayleyjeva regresija, če in samo če je  $n = 3$ .

**Ključne besede:** Posplošeni Cayleyjev graf, naravni izomorfizem, GCI-grupa, Cayleyjeva regresija.

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