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# Orienting and separating distance-transitive graphs

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## Abstract

It is shown that exactly 7 distance-transitive cubic graphs among the existing 12 possess a particular ultrahomogeneous property with respect to oriented cycles realizing the girth that allows the construction of a related Cayley digraph with similar ultrahomogeneous properties in which those oriented cycles appear minimally "pulled apart", or "separated" and whose description is truly beautiful and insightful. This work is proposed as the initiation of a study of similar ultrahomogeneous properties for distance-transitive graphs in general with the aim of generalizing to constructions of similar related "separator" Cayley digraphs.

**Keywords:** Distance-transitive graph, ultrahomogeneous graph, Cayley graph.

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# Orientiranje in separiranje razdaljno-tranzitivnih grafov


## Povzetek

V članku pokažemo, da ima natanko 7 od 12 razdaljno-tranzitivnih kubičnih grafov izmed 12, posebno lastnost ultrahomogenosti glede na družino orientiranih ciklov minimalne dolžine v danem grafu, kar omogoča konstrukcijo ustreznega Cayleyevega usmerjenega grafa s podobnimi lastnostmi ultrahomogonosti, v katerem so ti orientirani cikli minimalno “razmaknjeni” oz “ločeni”, in katerih opis je resnično čudovit in poučen. Članek predstavlja začetek raziskovanja utrahomogenosti splošnih razdaljno.tranziotivnih grafov, katerega cilj je posplošiti konstrukcije podobnih “separatorskih” Cayleyevih grafov.



**Ključne besede:** Razdaljno-tranzitivni grafi, ultrahomogeni graf, Cayleyev graf.