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Lobe, edge, and arc transitivity of graphs of connectivity 1

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Abstract

We give necessary and sufficient conditions for lobe-transitivity of locally finite and locally countable graphs whose connectivity equals 1. We show further that, given any biconnected graph Λ and a "code" assigned to each orbit of $\mathrm{Aut}(\Lambda)$, there exists a unique lobe-transitive graph Γ of connectivity 1 whose lobes are copies of Λ and is consistent with the given code at every vertex of Γ. These results lead to necessary and sufficient conditions for a graph of connectivity 1 to be edge-transitive and to be arc-transitive. Countable graphs of connectivity 1 the action of whose automorphism groups is, respectively, vertex-transitive, primitive, regular, Cayley, and Frobenius had been previously characterized in the literature.

Keywords: Lobe, lobe-transitive, edge-transitive, orbit, connectivity.

Math. Subj. Class.: 05C25, 05C63, 05C38, 20B27

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Reženjska, povezavna in ločna tranzitivnost grafov s povezanostjo 1

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Povzetek

Podamo potrebne in zadostne pogoje za reženjsko tranzitivnost lokalno končnih in lokalno števnih grafov, katerih povezanost je enaka 1. Nadalje pokažemo, da za vsak bipovezan graf Λ in "kodo", prirejeno vsaki orbiti grupe $\mathrm{Aut}(\Lambda)$, obstaja en sam reženjsko tranzitiven graf Γ s povezanostjo 1, katerega režnji so kopije grafa Λ in je konsistenten z dano kodo v vsakem vozlišču grafa Γ. Ti rezultati vodijo k potrebnim in zadostnim pogojem za to, da je graf s povezanostjo 1 povezavno tranzitiven in ločno tranzitiven. Števni grafi s povezanostjo 1, za katere je delovanje njihovih grup avtomorfizmov vozliščno tranzitivno, primitivno, regularno, Cayleyjevo ali Frobeniusovo, so bili v literaturi karakterizirani že prej.

Ključne besede: Reženj, reženjsko tranzitiven, povezavno tranzitiven, orbita, povezanost.

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