

## Quasi-semiregular automorphisms of cubic and tetravalent arc-transitive graphs

A non-trivial automorphism  $g$  of a graph  $\Gamma$  is called semiregular if the only power  $g^i$  fixing a vertex is the identity mapping, and it is called quasi-semiregular if it fixes one vertex and the only power  $g^i$  fixing another vertex is the identity mapping. In this paper, we prove that  $K_4$ , the Petersen graph and the Coxeter graph are the only connected cubic arc-transitive graphs admitting a quasi-semiregular automorphism, and  $K_5$  is the only connected tetravalent 2-arc-transitive graph admitting a quasi-semiregular automorphism. It will also be shown that every connected tetravalent  $G$ -arc-transitive graph, where  $G$  is a solvable group containing a quasi-semiregular automorphism, is a normal Cayley graph of an abelian group of odd order.

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