

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

A non-trivial automorphism g of a graph Γ 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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