Ann. Sc. Norm. Super. Pisa Cl. Sci. (5)
Vol. XII (2013), 369-438

Permutation groups with a cyclic two-orbits subgroup and monodromy groups of Laurent polynomials

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Abstract. We classify the finite primitive permutation groups which have a cyclic subgroup with two orbits. This extends classical topics in permutation group theory, and has arithmetic consequences. By a theorem of C. L. Siegel, affine algebraic curves with infinitely many integral points are parametrized by rational functions whose monodromy groups have this property. We classify the possibilities for these monodromy groups, and we give applications to Hilbert's irreducibility theorem.

Mathematics Subject Classification (2010): 12E25 (primary); 20B15, 12E05, 12F12, 14H30 (secondary).