Komeda, Jiryo

Weierstrass semigroups whose minimum positive integers are even. (English) Zbl 1125.14015
Arch. Math. 89, No. 1, 52-59 (2007).

Let C be a projective, non-singular, irreducible curve defined over an algebraically closed field k of characteristic zero and let $P \in C$. Denote by $\mathbb{N}_0$ the set of nonnegative integers and by $\mathrm{div}_\infty(f)$ the pole divisor of $f \in k(C)$; the set $H(P) := \{n \in \mathbb{N}_0 \mid \mathrm{div}_\infty(f) = nP\}$ is the Weierstrass semigroup of P, and it is a numerical semigroup i.e. $\#(\mathbb{N}_0 \setminus H(P)) < \infty$.

The paper under review presents results on two classes of Weierstrass semigroups, namely: $2n$-cyclic semigroups, i.e. semigroups $H(P)$ such that $2n$ is the least positive element, C is a cyclic covering of $\mathbb{P}^1(k)$ and P is a total ramification point; and $2n$-semigroups of double covering type, i.e. semigroups $H(P)$ where $2n$ is the least positive element, C is a double covering of a curve and P is a ramification point.

The main results in the paper prove that for any $n > 2$ the set of $2n$-semigroups of double covering type contain properly the set of $2n$-cyclic semigroups; also the set of semigroups which may be realized as Weierstrass semigroups of some point P at some curve C and have $2n$ as the least positive element contains properly the set of $2n$-semigroups of double covering type.

Reviewer: Cicero Carvalho (Uberlandia)

MSC:

14H55 Riemann surfaces; Weierstrass points; gap sequences
14H30 Coverings of curves, fundamental group
14M25 Toric varieties, Newton polyhedra, Okounkov bodies

Keywords:

Weierstrass semigroups; double coverings; cyclic coverings

Full Text: DOI