Bundschuh, Peter; Väänänen, Keijo

Linear independence measures for infinite products. (English) Zbl 0999.11036

Manuscr. Math. 105, No. 2, 253-263 (2001).

Let f be an entire transcendental function with rational coefficients in its power series about the origin, satisfying a functional equation $f(qz) = (z - c)f(z) + Q(z)$ with $q \in \mathbb{Z}$, $|q| \geq 2$, $c = \pm q^l$, $l \in \mathbb{Z}$ and $Q(z) \in \mathbb{Q}[z]$. Let $\alpha \in \mathbb{Q}^\times$ with $\alpha \neq \pm cq^k$ for $k = 1, 2, \ldots$. Then the numbers 1, $f(\alpha)$ and $f(-\alpha)$ are linear independent over $\mathbb{Q}$. Moreover, a linear independence measure of these numbers is given in this paper. If $c = -1$ and $Q(z) \equiv 0$, then the function f can be written as an infinite product, which has been extensively studied by several authors.

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MSC:

11J72 Irrationality; linear independence over a field

11J82 Measures of irrationality and of transcendence

Keywords:

linear independence; infinite products; entire transcendental function

Full Text: DOI