

On the value distribution of meromorphic functions in the punctured plane

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Abstract

We shall consider the punctured plane $\mathbb{C} \setminus 0$ as a degenerated annulus

$$A_{R_1 R_2} = \{z : R_1 < |z| < R_2\},$$

where $R_1 = 0$, $R_2 = \infty$. We shall make use of the value distribution theory in annuli as presented by R.Korhonen, and by A.Ya. Khristiyanin and A.A.Kondrayuk and analyze some well-known facts of the value distribution for meromorphic functions in the plane in this new setting. We remark that meromorphic functions in $\mathbb{C} \setminus 0$, can also be viewed as analytic functions in \mathbb{C} assuming as isolated singularities only poles outside zero and possibly with a non-isolated singularity of transcendental character at zero. In particular, we shall pay attention to Borel and deficient values for meromorphic functions of finite order.