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**Logarithmic Singularities
and the Zeros of the Second Derivative**

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Abstract. An estimate is obtained for the growth of a meromorphic function near to a logarithmic singularity of the derivative. This estimate is applied to show that if f is meromorphic of finite lower order in the plane, such that the second derivative f'' has finitely many zeros and the multiplicities of the poles z of f grow at most polynomially in $|z|$, then f has finitely many poles. Subsequent results then consider the zeros of linear differential polynomials $F = f^{(k)} + a_{k-1}f^{(k-1)} + \cdots + a_0f$, where f is transcendental and meromorphic of finite order in the plane, and the coefficients a_j are constants.

Keywords. Meromorphic functions, logarithmic singularities, zeros of derivatives.

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