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Extremal polynomials on a Jordan arc. (English) Zbl 07480982
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Summary: Let $\Gamma$ be a $C^2$ Jordan arc and let $\Gamma_0$ be the open arc which consists of interior points of $\Gamma$. We find concrete upper and lower bounds for the limit of Widom factors for $L_2(\mu)$ extremal polynomials on $\Gamma$ which was given in Widom (1969). In addition, we show that the upper bound for the limit supremum of Widom factors for the weighted Chebyshev polynomials which was obtained in Widom (1969) can be improved once two normal derivatives of the Green function do not agree at one point $z \in \Gamma_0$. We also show that if $\Gamma_0$ is not analytic then we have improved upper bounds.

MSC:

41-XX Approximations and expansions
42-XX Harmonic analysis on Euclidean spaces
41A17 Inequalities in approximation (Bernstein, Jackson, Nikol’skii-type inequalities)
41A44 Best constants in approximation theory
42C05 Orthogonal functions and polynomials, general theory of nontrigonometric harmonic analysis
33C45 Orthogonal polynomials and functions of hypergeometric type (Jacobi, Laguerre, Hermite, Askey scheme, etc.)

Keywords:
Widom factors; Chebyshev polynomials; orthogonal polynomials; extremal polynomials; Jordan arc

Full Text: DOI

References:


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