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Widom's formula for the leading coefficient of a polynomial which is orthonormal with respect to a varying weight. (English. Russian original) [Zbl 1281.42025](#)

Russ. Math. Surv. 67, No. 1, 183-185 (2012); translation from *Usp. Mat. Nauk* 67, No. 1, 183-184 (2012).

Summary: We obtain a strong asymptotic formula for the leading coefficient $\alpha_n(n)$ of a degree n polynomial $q_n(z; n)$ orthonormal on a system of intervals on the real line with respect to a varying weight. The weight depends on n as $e^{-2nQ(x)}$, where $Q(x)$ is a polynomial and corresponds to the "hard-edge-case". The formula in Theorem 1 is quite similar to Widom's classical formula for a weight independent of n . In some sense, Widom's formulas are still true for a varying weight and are thus universal. As a consequence of the asymptotic formula we have that $\alpha_n(n)e^{-nw_Q}$ oscillates as $n \rightarrow \infty$ and, in a typical case, fills an interval (here w_Q is the equilibrium constant in the external field Q).

MSC:

42C05 Orthogonal functions and polynomials, general theory of nontrigonometric harmonic analysis

Cited in **5** Documents

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