Erratum: Christoffel Functions, Orthogonal Polynomials, and Nevai's Conjecture for Freud Weights

A. L. Levin and D. S. Lubinsky

There is an oversight in the proof of Corollary 1.2(a) in the above paper as effectively the proof on pages 517ff. only shows that

$$1 - x_{1n}/a_n \leq Cn^{-2/3}$$

(The oversight occurs in (11.2) on page 518 in taking absolute values through the inf sign). This is actually the more difficult part of Corollary 1.2(a). For the (easier) converse inequality, one needs the following: If $K > 0$ is large enough, then for n large enough and $R \in \mathcal{P}_{2n}$, we have

$$\int_{|x| \geq a_n(1+Kn^{-2/3})} |R|W^2(x) dx \leq \frac{1}{2} \int_{|x| \leq a_n(1+Kn^{-2/3})} |R|W^2(x) dx.$$

This follows using the method of proof of Theorem 1.8 (pp. 513–514) and the estimate (7.14) (p. 486). Hence for $P \in \mathcal{P}_{2n-2}$, with $P \geq 0$,

$$\begin{aligned} & \int_{-\infty}^{\infty} [a_n(1+Kn^{-2/3}) - x] (PW^2)(x) dx \\ & \geq \frac{1}{2} \int_{|x| \leq a_n(1+K\delta_n)} [a_n(1+Kn^{-2/3}) - x] (PW^2)(x) dx \geq 0. \end{aligned}$$

Then

$$\begin{aligned} & a_n(1+Kn^{-2/3}) - x_{1n} \\ & = \inf_{\substack{P \in \mathcal{P}_{2n-2} \\ P \geq 0}} \int_{-\infty}^{\infty} [a_n(1+Kn^{-2/3}) - x] (PW^2)(x) dx / \int_{-\infty}^{\infty} (PW^2)(x) dx \geq 0. \end{aligned}$$

Date received: March 2, 1995. Communicated by Edward B. Saff

AMS classification: Primary 41A17, 42C05; Secondary 41A10.

Key words and phrases: Freud weights, Exponential weights, Orthonormal polynomials, Christoffel functions, Markov–Bernstein inequalities, Potentials, Discretization of potentials, Nevai's conjecture.

Thus

$$1 - x_{ln}/a_n \geq -C_1 n^{-2/3},$$

completing the proof of Corollary 1.2(a).

Reference

1. A. L. LEVIN, D. S. LUBINSKY (1992): *Christoffel Functions, Orthogonal Polynomials, and Nevai's Conjecture for Freud Weights*, *Constr. Approx.*, **8**:463–535.

A. L. Levin
Department of Mathematics
The Open University of Israel
16 Klausner Street
P.O.B. 39328
Ramat-Avir
Tel-Aviv 61392
Israel

D. S. Lubinsky
Department of Mathematics
University of Witwatersrand
P.O. Wits 2050
Republic of South Africa