Zeitschrift: Commentarii Mathematici Helvetici

Herausgeber: Schweizerische Mathematische Gesellschaft

Band: 60 (1985)

Erratum: Correction to "The growth of entire and harmonic functions along asymptotic paths".

Autor: Rossi, John / Weitsman, Allen

Comment. Math. Helvetici 60 (1985) 015–016 0010-2571/85/010015-02$01.50 + 0.20/0

Correction to

The growth of entire and harmonic functions along asymptotic paths

JOHN ROSSI and ALLEN WEITSMAN

It was brought to the authors' attention by J. M. Wu that the proof of Lemma 3 in our paper is incorrect, leaving a gap in the proof of Theorem 2. In this short note we will give a correct proof of Theorem 2. We will use all the notation including references and numbering that appear in the original paper.

Although Lemma 1 is correct as stated we need to restate it with (2.1) replaced with

$$\lim_{r\to\infty} (\log r)^{-1}\pi \int_1^r dt/t\theta^*(t) = \alpha \tag{2.1}$$

Note that we have dropped any reference to log density. Clearly (2.1) and (2.11) lead directly to (2.12) and the rest follows exactly as before.

Lemma 3 is in fact incorrect as stated. If we change (5.1) to

$$\overline{\lim_{r\to\infty}} (\log r)^{-1}\pi \int_1^r dt/t\theta^*(t) \le \rho, \tag{5.1}$$

(dropping any reference to log density), then Lemma 3 is correct. To prove this version of Lemma 3, assume that (5.1) is false then there exists $\rho_1 > \rho$ and a sequence $R_n \to \infty$ such that

$$\pi \int_1^{R_n} dt/t\theta^*(t) > \rho_1 \log R_n \tag{5.2}$$

Let $z \in D$ and chose R_n such that $|z| < R_n/4$. With the notation of (2.11) and (5.2) we have

$$w_{R_n}(z) \leq 9\sqrt{2}\,(|z|/R_n)^{\rho_1} \tag{5.3}$$

The rest of the proof of Lemma 3 now follows exactly as the proof of the original version with R replaced by R_n and $\rho_2(1-\varepsilon_m)$ by ρ_1. The proof of our new Lemma 3 is complete.

We may now give the proof of Theorem 2. First we restate (5.4) to read

$$\underline{\lim}_{r\to\infty} (\log r)^{-1}\, \pi \int_1^r dt/t\theta_1^*(t) = \alpha\,(\tfrac{1}{2} \leq \alpha < \infty), \tag{5.4}$$

where θ_1^* corresponds to θ^* for D_1. Then, since there exists another component of $\{|f| > K\}$, D_2, it can be easily seen (c.f. [3, Lemma 4]) that (5.4) implies

$$\overline{\lim}_{r\to\infty} (\log r)^{-1} \pi \int_1^r dt/t\theta_2^*(t) \geq (2\alpha - 1)/\alpha \tag{5.5}$$

where θ_2^* corresponds to θ^* for D_2. By Lemma 3 we must have $\pi/\rho \leq 2\pi - (\pi/\alpha)$ or

$$\alpha \geq \rho/(2\rho - 1) \tag{5.6}$$

This proof now continues as in the original paper.

Dept of Mathematics
VPI and SU
Blacksburg, Va 24061 USA

and

Dept of Mathematics
Purdue University
W. Lafayette In. USA

Received October 4, 1984