ERRATUM TO: RESULTS ON UNIQUENESS OF ENTIRE FUNCTIONS WHOSE CERTAIN DIFFERENCE POLYNOMIALS SHARE A SMALL FUNCTION

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The following are the corrected statements of the main results of [1].

THEOREM 1. *Let $f(z)$ and $g(z)$ be two transcendental entire functions of finite order, and $\alpha(z)$ ($\not\equiv 0$) be a small function of both $f(z)$ and $g(z)$. Suppose that η is a nonzero complex constant, n ($> k$), m (≥ 1) and k (≥ 0) are integers satisfying $n \geq 2k + m + 6$ when $m \leq k + 1$ and $n \geq 4k - m + 10$ when $m > k + 1$. If $(f^n(z)(f(z) - 1)^m f(z + \eta))^{(k)}$ and $(g^n(z)(g(z) - 1)^m g(z + \eta))^{(k)}$ share “ $(\alpha(z), 2)$ ” and if f, g have no 1-points with multiplicity less than or equal to k/m when $m \leq k$, then either $f(z) = g(z)$ or $f(z)$ and $g(z)$ satisfy the algebraic equation $R(f, g) = 0$ where $R(f, g)$ is given by (1.1) of [1].*

THEOREM 2. *Let $f(z)$ and $g(z)$ be two transcendental entire functions of finite order, and $\alpha(z)$ ($\not\equiv 0$) be a small function of both $f(z)$ and $g(z)$. Suppose that η is a nonzero complex constant, n ($> k$), m (≥ 1) and k (≥ 0) are integers satisfying $n \geq 3k + 2m + 8$ when $m \leq k + 1$ and $n \geq 6k - m + 13$ when $m > k + 1$. If $(f^n(z)(f(z) - 1)^m f(z + \eta))^{(k)}$ and $(g^n(z)(g(z) - 1)^m g(z + \eta))^{(k)}$ share $(\alpha(z), 2)^*$ and if f, g have no 1-points with multiplicity less than or equal to k/m when $m \leq k$, then conclusions of Theorem 1 hold.*

THEOREM 3. *Let $f(z)$ and $g(z)$ be two transcendental entire functions of finite order, and $\alpha(z)$ ($\not\equiv 0$) be a small function of both $f(z)$ and $g(z)$. Suppose that η is a nonzero complex constant, n ($> k$), m (≥ 1) and k (≥ 0)*

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are integers satisfying $n \geq 5k + 4m + 12$ if $m \leq k + 1$ and $n \geq 10k - m + 19$ if $m > k + 1$. If

$$\begin{aligned} & \overline{E}_2(\alpha(z), (f^n(z)(f(z) - 1)^m f(z + \eta))^{(k)}) \\ &= \overline{E}_2(\alpha(z), (g^n(z)(g(z) - 1)^m g(z + \eta))^{(k)}) \end{aligned}$$

and if f, g have no 1-points with multiplicity less than or equal to k/m when $m \leq k$, then conclusions of Theorem 1 hold.

In the proof of Theorem 1 (see [1, p. 267]), the authors claimed in Case 1 when $B = -1$, after obtaining $FG = 1$, that,

$$(f^n(z)(f(z) - 1)^m f(z + \eta))^{(k)} (g^n(z)(g(z) - 1)^m g(z + \eta))^{(k)} = \alpha^2$$

gives $N(r, 0; f) = S(r, f)$ and $N(r, 1; f) = S(r, f)$, which might not be the case always. The argument is thus corrected as follows:

We have

$$(f^n(z)(f(z) - 1)^m f(z + \eta))^{(k)} (g^n(z)(g(z) - 1)^m g(z + \eta))^{(k)} = \alpha^2.$$

From the above, we easily see that $N(r, 0; f) = S(r, f)$ as $n > k$ and $N(r, 1; f) = S(r, f)$ as f, g have no 1-points with multiplicity less than or equal to k/m when $m \leq k$.

The extra condition is needed in the other two theorems as their proofs make use of a similar argument as given above.

References

- [1] P. Sahoo and H. Karmakar, Results on uniqueness of entire functions whose certain difference polynomials share a small function, *Anal. Math.*, **41** (2015), 257–272.

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