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Corrigendum and addendum to the paper "Reducibility of quadrinomials"

(Acta Arith. 21 (1972), 153–171)

by

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Page 161:

- line 3: for the second exponent $1/3$ read $-1/3$, for $64a_0a_1a_3^2$ read $64a_0a_2a_3^2$;
- line 5: for a_1x read a_1x^δ;
- line 9: for $-a_3$ read a_3, for $/y$ read $/4$;
- line 16: for $-a_3$ read a_3.

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- line 9: after "and" insert "for $n_2 > 2$";
- line 11: before the period add "; for $n_2 = 2$ there is only one branch point ($\varepsilon = -1$)";
- line 13: after "$n_1 = 1$" replace the comma by "and either";
- line 15: replace the period by the following text: ", or $n_1 - 1 = 1$; $-\frac{a_1^2}{4a_0} = -2\sqrt{a_2a_3}$; $a_1^4 = 64a_0^2a_2a_3$ and $q(x,y) = a_0x^{2\delta}y^{2\varepsilon} + a_1x^\delta y^{2\varepsilon} + a_2y^{4\varepsilon} + a_3 = u^2 - 4tuvw - t^2v^4 - 4t^2w^4$, where $t = 1$, $u = a_0^{1/2}x^\delta y^\varepsilon$, $v = (-a_2)^{1/4}y^\varepsilon$, $w = (-a_3/4)^{1/4}$ and suitable values of the quadratic roots and quartic roots are taken. In the latter case the factors $u \pm tv^2 - 2tvw \pm 2tw^2$ are irreducible over $\mathbb{C}$, since they equal

$$a_0^{1/2}x^\delta y^\varepsilon \pm [(-a_2)^{1/2}y^{2\varepsilon} - 2(-a_2)^{1/4}(-a_3/4)^{1/4}y^\varepsilon + 2(-a_3/4)^{1/4}]$$

and the expression in brackets is not a power in $\mathbb{C}[y_1]$. Moreover, one verifies directly that the factors are non-reciprocal."

The proof of Theorem 1 amounts to investigating factors of rational functions of the form $f(x) - g(y)$ (variables separated). When both f and g are polynomials the investigation is easier and [4] has far-reaching results.

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We know of little work beyond the quadrinomial case of this paper on the investigation of factors of rational functions with variables separated.

Reference

[4] M. Fried, *The field of definition of function fields and a problem in the reducibility of polynomials in two variables*, Illinois J. Math. 17 (1973), 128–146. (These are the complete data of reference item [4] of the original article.)

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