MR2140050 (2006c:12010a) 12H05 (03C60)

Kirby, Jonathan (4-OX)

A Schanuel condition for Weierstrass equations. (English summary)

J. Symbolic Logic **70** (2005), *no. 2,* 631–638.

MR2158459 (2006c:12010b) 12H05 (03C60)

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Corrigendum to: "A Schanuel condition for Weierstrass equations" [J. Symbolic Logic 70 (2005), no. 2, 631–638; MR2140050 (2006c:12010a)].

J. Symbolic Logic **70** (2005), *no. 3,* 1023.

Consider an ordinary differential field F of characteristic zero with differentiation δ and C as the field of constants. For n solutions in F of the equation $\delta y_i = y_i \delta x_i$ we have $\operatorname{tr.deg}_{C} C(x_1, y_1, \dots, x_n, y_n) \geq n+1$ if the elements δx_i are linearly independent over C [see J. Ax, Ann. of Math. (2) **93** (1971), 252–268; MR0277482 (43 #3215)]. The paper under review studies such a problem for another differential equation, namely, for the Weierstrass one: $(\delta y)^2 = f(y)(\delta x)^2$, where f is a cubic with constant coefficients and without multiple roots.

The author first gives a similar result with one equation and many solutions (Proposition 1.1), and then does this having several different cubics f_i (Proposition 1.2) with a certain extra condition for relations between f_i. Finally, these results are generalized for a partial differential field F with the basic set of differentiations $\Delta = \{\delta_1, \dots, \delta_s\}$. The statement is similar: $\operatorname{tr.deg}_{C} C(\{x_{ik}, y_{ik}\}) \geq \sum_i n_i + r$, where r is the rank of the Jacobi matrix $(\delta_l x_{ik})$ and (x_{ik}, y_{ik}) are n_i solutions for the corresponding Weierstrass equations with different cubics f_i.

In the corrigendum the author provides corrections for the two statements of the paper under review: the conditions for the relations between cubics f_i in Propositions 1.2 and 3.2 should be given in a stronger way.

Reviewed by *Alexey I. Ovchinnikov*

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