Title: On the resolution of equations $Ax^n - By^n = C$ in integers x, y and $n \geq 3$, II

Author(s): András Bazsó, Attila Bérczes, Kálmán Győry and Ákos

In Part I of this paper, the title equation was solved in $x, y, n \in \mathbb{Z}$ with $|xy| > 1$, $n \geq 3$ for a collection of positive integers A, B, C under certain bounds. In the present paper we extend these results to much larger ranges of A, B, C. We give among other things all the solutions for $A = C = 1$, $B < 235$ (cf. Theorem 1), and for $C = 1$, $A, B \leq 50$, with six explicitly given exceptions (A, B, n) (cf. Theorem 3). The equations under consideration are solved by combining powerful techniques, including Frey curves and associated modular forms, lower bounds for linear forms in logarithms, the hypergeometric method of Thue and Siegel, local methods, classical cyclotomy and computational approaches to Thue equations of low degree. Along the way, we derive a new result on the solvability of binomial Thue equations (cf. Theorem 6) which is crucial in the proof of our Theorems 1 and 2. Some important applications of our theorems will be given in a forthcoming paper.

Address
Institute of Mathematics
Number Theory Research Group
of the University of Debrecen
and the Hungarian Academy
of Sciences
H-4010 Debrecen, P.O. Box 12
Hungary