

FACTORIZATIONS OF $a^n \pm 1$, $13 \leq a < 100$

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ABSTRACT

As an extension of the “Cunningham” tables [4, 5] we present tables of factorizations of $a^n \pm 1$ for $13 \leq a < 100$. The exponents n satisfy $a^n < 10^{255}$ if $a < 30$, and $n \leq 100$ if $a \geq 30$. The factorizations are complete for $n \leq 46$, and the tables contain no composite numbers smaller than 10^{80} .

COMMENTS

Only the Abstract is given here. The full report appeared as [2], and an update as [3]. The factors and updates are available in machine-readable form: see [1].

REFERENCES

- [1] R. P. Brent, *Factor: An Integer Factorization Program for the IBM PC*, Report TR-CS-89-23, October 1989, 7 pp. rpb117.
- [2] R. P. Brent and H. J. J. te Riele, “Factorizations of $a^n \pm 1$, $13 \leq a < 100$ ” Report NM-R9212, Centrum voor Wiskunde en Informatica, Amsterdam, June 1992, 368 pp. ISSN 0169-0388. rpb134.
- [3] R. P. Brent, P. L. Montgomery and H. J. J. te Riele, “Update 1 to Factorizations of $a^n \pm 1$, $13 \leq a < 100$ ” Centrum voor Wiskunde en Informatica, Amsterdam, September 1994, 46 pp., to appear.
- [4] J. Brillhart, D. H. Lehmer, J. L. Selfridge, B. Tuckerman and S. S. Wagstaff, Jr., *Factorizations of $b^n \pm 1$, $b = 2, 3, 5, 6, 7, 10, 11, 12$ up to high powers*, American Mathematical Society, Providence, Rhode Island, second edition, 1988.
- [5] A. J. C. Cunningham and H. J. Woodall, *Factorisation of $y^n \mp 1$, $y = 2, 3, 5, 6, 7, 10, 11, 12$ Up to High Powers (n)*, Hodgson, London, 1925.

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