

Bertin, Marie José; Zudilin, Wadim

On the Mahler measure of hyperelliptic families. (English. French summary) Zbl 1434.11211
Ann. Math. Qué. 41, No. 1, 199-211 (2017).

Summary: We prove Boyd's "unexpected coincidence" of the Mahler measures for two families of two-variate polynomials defining curves of genus 2. We further equate the same measures to the Mahler measures of polynomials $y^3 - y + x^3 - x + kxy$ whose zero loci define elliptic curves for $k \neq 0, \pm 3$.

MSC:

11R06 PV-numbers and generalizations; other special algebraic numbers; Mahler measure
11G30 Curves of arbitrary genus or genus $\neq 1$ over global fields
14H52 Elliptic curves

Cited in **1** Review
Cited in **5** Documents

Keywords:

Mahler measure; L -value; elliptic curve; hyperelliptic curve; elliptic integral

Software:

LMFDB

Full Text: [DOI](#) [arXiv](#)

References:

- [1] Bertin, M.J., Zudilin, W.: On the Mahler measure of a family of genus 2 curves. *Math. Zeitschrift.* **283**(3), 1185-1193. doi:10.1007/s00209-016-1637-6 · [Zbl 1347.11076](#)
- [2] Boyd, D, Mahler's measure and special values of L -functions, *Exp. Math.*, 7, 37-82, (1998) · [Zbl 0932.11069](#) · doi:10.1080/10586458.1998.10504357
- [3] Boyd, D.W., Rodriguez-Villegas, F.: With an appendix by N. M. Dunfield, Mahler's measure and the dilogarithm (II), Preprint (2003). arXiv:math/0308041 [math.NT] · [Zbl 0932.11069](#)
- [4] Brunault, F, Regulators of Siegel units and applications, *J. Number Theory*, 163, 542-569, (2016) · [Zbl 1344.19001](#) · doi:10.1016/j.jnt.2015.12.019
- [5] Rodriguez-Villegas, F.: Modular Mahler measures I. In: *Topics in number theory*, (University Park, PA, 1997), *Math. Appl.*, vol. 467, pp. 17-48. Kluwer Acad. Publ, Dordrecht (1999) · [Zbl 0980.11026](#)
- [6] The LMFDB Collaboration: The L -functions and Modular Forms Database, <http://www.lmfdb.org>. Accessed 23 December 2015 (2013-2015) · [Zbl 1386.11129](#)
- [7] Zudilin, W, Regulator of modular units and Mahler measures, *Math. Proc. Camb. Phil. Soc.*, 156, 313-326, (2014) · [Zbl 1386.11129](#) · doi:10.1017/S0305004113000765

This reference list is based on information provided by the publisher or from digital mathematics libraries. Its items are heuristically matched to zbMATH identifiers and may contain data conversion errors. It attempts to reflect the references listed in the original paper as accurately as possible without claiming the completeness or perfect precision of the matching.