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## Diophantine equations in positive characteristic

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# Bibliography

- [1] B. Alberts. Cohen-Lenstra Moments for Some Nonabelian Groups. August 2016.
- [2] B. Alberts and J. Klys. The distribution of  $H_8$ -extensions of quadratic fields. June 2017.
- [3] F. Beukers and H. P. Schlickewei. The equation  $x + y = 1$  in finitely generated groups. *Acta Arith.*, 78(2):189–199, 1996.
- [4] M. Bhargava. The geometric sieve and the density of squarefree values of invariant polynomials. January 2014.
- [5] E. Bombieri and J. Mueller. The generalized Fermat equation in function fields. *J. Number Theory*, 39(3):339–350, 1991.
- [6] B. Brindza. The Catalan equation over finitely generated integral domains. *Publ. Math. Debrecen*, 42(3-4):193–198, 1993.
- [7] Nils Bruin and Brett Hemenway. On congruent primes and class numbers of imaginary quadratic fields. *Acta Arith.*, 159(1):63–87, 2013.
- [8] D. A. Burgess. On character sums and  $L$ -series. II. *Proc. Lond. Math. Soc. (3)*, 13:524–536, 1963.
- [9] Y.-C. Chiu.  $S$ -unit equation over algebraic function fields of characteristic  $p > 0$ . *Master Thesis, National Taiwan University*, 2002.
- [10] H. Cohen and H. W. Lenstra, Jr. Heuristics on class groups of number fields. In *Number theory, Noordwijkerhout 1983 (Noordwijkerhout, 1983)*, volume 1068 of *Lecture Notes in Math.*, pages 33–62. Springer, Berlin, 1984.
- [11] H. Cohn and J. C. Lagarias. On the existence of fields governing the 2-invariants of the classgroup of  $\mathbf{Q}(\sqrt{dp})$  as  $p$  varies. *Math. Comp.*, 41(164):711–730, 1983.
- [12] H. Cohn and J. C. Lagarias. Is there a density for the set of primes  $p$  such that the class number of  $\mathbf{Q}(\sqrt{-p})$  is divisible by 16? In *Topics in classical number theory, Vol. I, II (Budapest, 1981)*, volume 34 of *Colloq. Math. Soc. János Bolyai*, pages 257–280. North-Holland, Amsterdam, 1984.

- [13] Pietro Corvaja and Umberto Zannier. An *abcd* theorem over function fields and applications. *Bull. Soc. Math. France*, 139(4):437–454, 2011.
- [14] H. Davenport and H. Heilbronn. On the density of discriminants of cubic fields. II. *Proc. Roy. Soc. London Ser. A*, 322(1551):405–420, 1971.
- [15] C.-J. de la Vallée Poussin. *Mém. Couronnés Acad. Roy. Belgique*, 59:1–74, 1899.
- [16] H. Derksen and D. Masser. Linear equations over multiplicative groups, recurrences, and mixing I. *Proc. Lond. Math. Soc. (3)*, 104(5):1045–1083, 2012.
- [17] J.-H. Evertse. On equations in  $S$ -units and the Thue-Mahler equation. *Invent. Math.*, 75(3):561–584, 1984.
- [18] Jan-Hendrik Evertse and Kálmán Györy. *Unit equations in Diophantine number theory*, volume 146 of *Cambridge Studies in Advanced Mathematics*. Cambridge University Press, Cambridge, 2015.
- [19] É. Fouvry and J. Klüners. Cohen-Lenstra heuristics of quadratic number fields. In *Algorithmic number theory*, volume 4076 of *Lecture Notes in Comput. Sci.*, pages 40–55. Springer, Berlin, 2006.
- [20] É. Fouvry and J. Klüners. On the 4-rank of class groups of quadratic number fields. *Invent. Math.*, 167(3):455–513, 2007.
- [21] É. Fouvry and J. Klüners. On the negative Pell equation. *Ann. of Math. (2)*, 172(3):2035–2104, 2010.
- [22] É. Fouvry and J. Klüners. The parity of the period of the continued fraction of  $\sqrt{d}$ . *Proc. Lond. Math. Soc. (3)*, 101(2):337–391, 2010.
- [23] J. B. Friedlander and H. Iwaniec. The polynomial  $X^2 + Y^4$  captures its primes. *Ann. of Math. (2)*, 148(3):945–1040, 1998.
- [24] J. B. Friedlander, H. Iwaniec, B. Mazur, and K. Rubin. The spin of prime ideals. *Invent. Math.*, 193(3):697–749, 2013.
- [25] J. B. Friedlander, H. Iwaniec, B. Mazur, and K. Rubin. Erratum to: The spin of prime ideals. *Invent. Math.*, 202(2):923–925, 2015.
- [26] C. F. Gauss. *Disquisitiones arithmeticae*. Springer-Verlag, New York, 1986. Translated and with a preface by Arthur A. Clarke, Revised by William C. Waterhouse, Cornelius Greither and A. W. Grootendorst and with a preface by Waterhouse.
- [27] F. Gerth, III. The 4-class ranks of quadratic fields. *Invent. Math.*, 77(3):489–515, 1984.
- [28] Rajiv Gupta and M. Ram Murty. A remark on Artin’s conjecture. *Invent. Math.*, 78(1):127–130, 1984.

- [29] H. Halberstam and H.-E. Richert. *Sieve methods*. Academic Press [A subsidiary of Harcourt Brace Jovanovich, Publishers], London-New York, 1974. London Mathematical Society Monographs, No. 4.
- [30] G. H. Hardy and J. E. Littlewood. Some problems of ‘Partitio numerorum’; III: On the expression of a number as a sum of primes. *Acta Math.*, 44(1):1–70, 1923.
- [31] H. Hasse. Über die Klassenzahl des Körpers  $P(\sqrt{-2p})$  mit einer Primzahl  $p \neq 2$ . *J. Number Theory*, 1:231–234, 1969.
- [32] D. R. Heath-Brown. Artin’s conjecture for primitive roots. *Quart. J. Math. Oxford Ser. (2)*, 37(145):27–38, 1986.
- [33] D. R. Heath-Brown. The size of Selmer groups for the congruent number problem. II. *Invent. Math.*, 118(2):331–370, 1994. With an appendix by P. Monsky.
- [34] A. H. Helfgott. The ternary Goldbach problem. January 2015.
- [35] Christopher Hooley. On Artin’s conjecture. *J. Reine Angew. Math.*, 225:209–220, 1967.
- [36] Liang-Chung Hsia and Julie Tzu-Yueh Wang. The *ABC* theorem for higher-dimensional function fields. *Trans. Amer. Math. Soc.*, 356(7):2871–2887, 2004.
- [37] H. Iwaniec and E. Kowalski. *Analytic number theory*, volume 53 of *American Mathematical Society Colloquium Publications*. American Mathematical Society, Providence, RI, 2004.
- [38] Daniel M. Kane. An asymptotic for the number of solutions to linear equations in prime numbers from specified Chebotarev classes. *Int. J. Number Theory*, 9(4):1073–1111, 2013.
- [39] J. Klys. Moments of unramified 2-group extensions of quadratic fields. October 2017.
- [40] P. Koymans. The generalized Catalan equation in positive characteristic. October 2016.
- [41] P. Koymans and D. Z. Milovic. Spins of prime ideals and the negative Pell equation. *Compos. Math.*, 155(1):100–125, 2019.
- [42] P. H. Koymans. The Catalan equation. *Indag. Math. (N.S.)*, 28(2):321–352, 2017.
- [43] Peter Koymans and Djordjo Milovic. On the 16-rank of class groups of  $\mathbb{Q}(\sqrt{-2p})$  for primes  $p \equiv 1 \pmod{4}$ . *International Mathematics Research Notices*, page rny010, 2018.
- [44] Peter Koymans and Carlo Pagano. On the equation  $X_1 + X_2 = 1$  in finitely generated multiplicative groups in positive characteristic. *Q. J. Math.*, 68(3):923–934, 2017.

- [45] S. Lang. *Algebraic Number Theory*. Springer-Verlag, New York, second edition, 1986.
- [46] Serge Lang. *Introduction to algebraic geometry*. Addison-Wesley Publishing Co., Inc., Reading, Mass., 1972. Third printing, with corrections.
- [47] Serge Lang. *Fundamentals of Diophantine geometry*. Springer-Verlag, New York, 1983.
- [48] J. L. Lavoie, F. Grondin, and A. K. Rathie. Generalizations of Whipple’s theorem on the sum of a  ${}_3F_2$ . *J. Comput. Appl. Math.*, 72(2):293–300, 1996.
- [49] Dominik Leitner. Linear equations over multiplicative groups in positive characteristic II. *J. Number Theory*, 180:169–194, 2017.
- [50] F. Lemmermeyer. *Reciprocity laws*. Springer Monographs in Mathematics. Springer-Verlag, Berlin, 2000. From Euler to Eisenstein.
- [51] H. W. Lenstra, Jr. On Artin’s conjecture and Euclid’s algorithm in global fields. *Invent. Math.*, 42:201–224, 1977.
- [52] H. W. Lenstra, Jr., P. Stevenhagen, and P. Moree. Character sums for primitive root densities. *Math. Proc. Cambridge Philos. Soc.*, 157(3):489–511, 2014.
- [53] P. A. Leonard and K. S. Williams. On the divisibility of the class numbers of  $Q(\sqrt{-p})$  and  $Q(\sqrt{-2p})$  by 16. *Canad. Math. Bull.*, 25(2):200–206, 1982.
- [54] R. C. Mason. *Diophantine equations over function fields*, volume 96 of *London Mathematical Society Lecture Note Series*. Cambridge University Press, Cambridge, 1984.
- [55] D. W. Masser. Mixing and linear equations over groups in positive characteristic. *Israel J. Math.*, 142:189–204, 2004.
- [56] C. McMeekin. On the Asymptotics of a Prime Spin Relation. November 2018.
- [57] D. Milovic. The infinitude of  $Q(\sqrt{-p})$  with class number divisible by 16. *ArXiv e-prints*, February 2015.
- [58] D. Milovic. On the 16-rank of class groups of  $Q(\sqrt{-8p})$  for  $p \equiv -1 \pmod{4}$ . *Geom. Funct. Anal.*, 27(4):973–1016, 2017.
- [59] Pieter Moree. On primes in arithmetic progression having a prescribed primitive root. II. *Funct. Approx. Comment. Math.*, 39(part 1):133–144, 2008.
- [60] Pieter Moree. Artin’s primitive root conjecture—a survey. *Integers*, 12(6):1305–1416, 2012.
- [61] P. Morton. Density result for the 2-classgroups of imaginary quadratic fields. *J. Reine Angew. Math.*, 332:156–187, 1982.

- [62] L. Rédei. Arithmetischer Beweis des Satzes über die Anzahl der durch vier teilbaren Invarianten der absoluten Klassengruppe im quadratischen Zahlkörper. *J. Reine Angew. Math.*, 171:55–60, 1934.
- [63] Matthias Schütt, Tetsuji Shioda, and Ronald van Luijk. Lines on Fermat surfaces. *J. Number Theory*, 130(9):1939–1963, 2010.
- [64] J.-P. Serre. Résumé des cours de 1977-1978. *Annuaire du Collège de France*, pages 67–70, 1978.
- [65] Xuancheng Shao. A density version of the Vinogradov three primes theorem. *Duke Math. J.*, 163(3):489–512, 2014.
- [66] Joseph H. Silverman. The Catalan equation over function fields. *Trans. Amer. Math. Soc.*, 273(1):201–205, 1982.
- [67] Joseph H. Silverman. The  $S$ -unit equation over function fields. *Math. Proc. Cambridge Philos. Soc.*, 95(1):3–4, 1984.
- [68] A. Smith. Governing fields and statistics for 4-Selmer groups and 8-class groups. *ArXiv e-prints*, July 2016.
- [69] A. Smith.  $2^\infty$ -Selmer groups,  $2^\infty$ -class groups, and Goldfeld’s conjecture. *ArXiv e-prints*, February 2017.
- [70] P. Stevenhagen. Ray class groups and governing fields. In *Théorie des nombres, Année 1988/89, Fasc. 1*, Publ. Math. Fac. Sci. Besançon, page 93. Univ. Franche-Comté, Besançon, 1989.
- [71] P. Stevenhagen. Divisibility by 2-powers of certain quadratic class numbers. *J. Number Theory*, 43(1):1–19, 1993.
- [72] W. W. Stothers. Polynomial identities and Hauptmoduln. *Quart. J. Math. Oxford Ser. (2)*, 32(127):349–370, 1981.
- [73] R.-C. Vaughan. Sommes trigonométriques sur les nombres premiers. *C. R. Acad. Sci. Paris Sér. A-B*, 285(16):A981–A983, 1977.
- [74] I. M. Vinogradov. Representation of an odd number as a sum of three primes. *C. R. (Dokl.) Acad. Sci. URSS*, 15:291–294, 1937.
- [75] I. M. Vinogradov. The method of trigonometrical sums in the theory of numbers. *Trav. Inst. Math. Stekloff*, 23:109, 1947.
- [76] I. M. Vinogradov. *The method of trigonometrical sums in the theory of numbers*. Dover Publications, Inc., Mineola, NY, 2004. Translated from the Russian, revised and annotated by K. F. Roth and Anne Davenport, Reprint of the 1954 translation.
- [77] José Felipe Voloch. Diagonal equations over function fields. *Bol. Soc. Brasil. Mat.*, 16(2):29–39, 1985.

- [78] José Felipe Voloch. The equation  $ax + by = 1$  in characteristic  $p$ . *J. Number Theory*, 73(2):195–200, 1998.
- [79] M. Widmer. Counting primitive points of bounded height. *Trans. Amer. Math. Soc.*, 362(9):4793–4829, 2010.
- [80] M. M. Wood. Non-Abelian Cohen-Lenstra moments. July 2018.