

Publications of
YURI MATIYASEVICH

- [1] Простые примеры неразрешимых ассоциативных исчислений. *Доклады АН СССР*, 173(6):1264–1266, 1967. English translation: Simple examples of undecidable associative calculi. *Soviet Math. Dokl.*, 8:555–557, 1967. MR 36, #50. Zbl 0189.01102.
- [2] Простые примеры неразрешимых канонических исчислений. *Труды Матем. ин-та АН СССР*, 93:50–88, 1967. English translation: Simple examples of unsolvable canonical calculi. *Proc Steklov Inst. Math.*, 93:61–110, 1967. Zbl 0193.31801.
- [3] Связь систем уравнений в словах и длинах с 10-й проблемой Гильберта. *Записки научных семинаров ЛОМИ АН СССР*, 8:132–144, 1968. English translation: The connection between Hilbert’s Tenth Problem and systems of equations between words and lengths. *Seminars in Mathematics, V.A.Steklov Mathematical Institute*, 8:61–67, 1970. MR 40, # 41. Zbl 0235.10012.
- [4] Две редукции 10-й проблемы Гильберта. *Записки научных семинаров ЛОМИ АН СССР*, 8:145–158, 1968. English translation: Two reductions of Hilbert’s Tenth Problem. *Seminars in Mathematics, V.A.Steklov Mathematical Institute*, 8:68–74, 1970. Zbl 0212.33302.
- [5] Арифметические представления степеней. *Записки научных семинаров ЛОМИ АН СССР*, 8:159–165, 1968. English translation: Arithmetic representations of powers. *Seminars in Mathematics, V.A.Steklov Mathematical Institute*, 8:75–78, 1970. MR 39, #62. Zbl 0235.10012.
- [6] Диофантовость перечислимых множеств. *Доклады АН СССР*, 191(2):279–282, 1970. English translation: Enumerable sets are Diophantine. *Soviet Math. Dokl.*, 11:354–357, 1970. Hungarian translation: (Solution of tenth problem of Hilbert). *Mat. Lapok.*, 21:83–87, 1970. MR 41, #3390. Zbl 0212.33401. Reprinted in: *Mathematical logic in the 20th century*, Gerald E. Sacks, edt., Singapore University Press, Singapore; World Scientific Publishing Co., Inc., River Edge, NJ, 2003.

- [7] Диофантово представление перечислимых предикатов. *Известия АН СССР, сер. матем.*, 35(1):3–30, 1971. English translation: Diophantine representation of enumerable predicates. *Math. of the USSR–Izvestija*, 5[1971]:1–28, 1972. MR 43, #54. Zbl 0252.02047.
- [8] Диофантово представление множества простых чисел. *Доклады АН СССР*, 196(4):770–773, 1971. English translation: Diophantine representation of the set of prime numbers. *Soviet Math. Doklady*, 12(4):249–254, 1971. MR 43, #1921.
- [9] Достаточное условие сходимости монотонных последовательностей. *Записки научных семинаров ЛОМИ АН СССР*, 20:97–103, 1971. English translation: A sufficient condition for the convergence of monotone sequences. *Journal of Soviet Mathematics*, 1(1):59–63, 1973. Zbl 0252.02033.
- [10] О распознавании в реальное время отношения вхождения. *Записки научных семинаров ЛОМИ АН СССР*, 20:104–114, 1971. English translation: Real-time recognition of the inclusion relation. *Journal of Soviet Mathematics*, 1(1):64–70, 1973. Zbl 253.02043.
- [11] Diophantine representation of recursively enumerable predicates. In *Actes Congres Intern. Math. (Nice, 1970)*, pages 235–238, Paris, 1971. Gauthier-Villars. MR 54, #2444. Zbl 0235.02039.
- [12] Diophantine representation of recursively enumerable predicates. In Fenstad J. E. editor, *Proceedings of the Second Scandinavian Logic Symposium*, pages 171–177, Amsterdam, 1971. North-Holland. Zbl 0223.02042.
- [13] (with W. W. Boone and D. J. Collins) Embeddings into semigroups with only a few defining relations. In J.E.Fenstad, editor, *Proceedings of the Second Scandinavian Logic Symposium*, pages 27–40, Amsterdam, 1971. North-Holland. Zbl 0228.20029.
- [14] Диофантово представление перечислимых предикатов. *Математические заметки*, 12(1):115–120, 1972. English translation: Diophantine representation of enumerable predicates. *Mathematical Notes*, 12(1):501–504, 1972. Zbl 255.05104.

- [15] Диофантовы множества. *Успехи матем. наук*, 27(5/176):185–222, 1972. English translation: Diophantine sets. *Russian Math. Surveys*, 27(5):124–164, 1972. Zbl 0269.02019.
- [16] Применение методов теории логического вывода в теории графов. *Математические заметки*, 12(6):781–790, 1972. English translation: The application of the methods of the theory of logical derivation to graph. *Mathematical Notes*, 12(1972)(6):904–908, 1973.
- [17] Арифметические представления перечислимых множеств с небольшим числом кванторов. *Записки научных семинаров ЛОМИ АН СССР*, 32:77–84, 1972. English translation: Arithmetical representation of enumerable sets with a small number of quantifiers. *Journal of Soviet Math.*, 6(4):410–416, 1976. MR 49 #8835.
- [18] On recursive unsolvability of Hilbert’s tenth problem. *Studies in Logic and Found. of Math.*, 74:89–110, 1973. MR 0465823 (57 #5711).
- [19] Существование неэффективизируемых оценок в теории экспоненциально диофантовых уравнений. *Записки научных семинаров ЛОМИ АН СССР*, 40:77–93, 1974. English translation: Existence of noneffec-tivable estimates in the theory of exponential Diophantine equations. *Journal of Soviet Mathematics*, 8(3):299–311, 1977. MR 0374025 (51 #10225). Zbl 361.02057.
- [20] Одна схема доказательств в дискретной математике. *Записки научных семинаров ЛОМИ АН СССР*, 40:94–100, 1974. English translation: A proof scheme in discrete mathematics. *J. Soviet Math.*, 8:312–316, 1977. MR 0363823 (51 #78). Zbl 359.68106.
- [21] (with J. Robinson) Два универсальных трехкванторных представле-ния перечислимых множеств (Two universal three-quantifier represen-tations of enumerable sets). In *Теория алгорифмов и математическая логика*. ВЦ АН СССР, Москва, 112–123, 1974. English translation: <http://arXiv.org/abs/0802.1052>. MR 0406780 (53 #10566). Zbl 327.02035.
- [22] Один критерий раскрашиваемости вершин графа, формулируемый в терминах ориентаций ребер (A criteria of colorability of vertices of a

- graph stated in term of edge orientations). *Дискретный анализ*, 26:65–71, 1974. Zbl 298.05114. English translation: <http://arXiv.org/abs/0712.1884>.
- [23] (with J. Robinson) Reduction of Diophantine equation to one in 13 unknowns. *Acta Arithmetica*, 27:521–553, 1975. MR 52 #8033.
 - [24] О метаматематическом подходе к задачам дискретной математики. *Записки научных семинаров ЛОМИ АН СССР*, 49:31–50, 1975. English translation: Metamathematical approach to proving theorems of discrete mathematics. *J. Soviet Math.*, 10:517–533, 1978. MR 0376327 (51 #12503). Zbl 325.68048, Zbl 0401.68074.
 - [25] (with M. Davis and J. Robinson) Hilbert’s Tenth Problem. Diophantine equations: positive aspects of a negative solution. *Proc. Symp. Pure Math.*, 28:323–378, 1976. MR 55 #5522.
 - [26] Новое доказательство теоремы об экспоненциально диофантовом представлении перечислимых предикатов. *Записки научных семинаров ЛОМИ АН СССР*, 60:75–92, 1976. English translation: A new proof of the theorem on exponential Diophantine representation of enumerable sets. *J. Soviet Math.*, 14(5):1475–1486, 1980. MR 58 #27402. Zbl 449.03043.
 - [27] О задаче характеристизации множества степеней данного числа в терминах остатков разложения квадратичных иррациональностей в цепную дробь (On the problem of characterization of the set of powers of a given number in terms of remainders of expansions of quadratic irrationalities into continuous fraction). In *Цепные дроби и их применения*. Киев, 75–76, 1976.
 - [28] Об одном представлении хроматического многочлена (On a representation of the chromatic polynomial). *Дискретный анализ*, 31:61–70, 1977. Zbl 435.05025. English translation: <http://arXiv.org/abs/0712.1884>.
 - [29] Один класс критериев простоты, формулируемый в терминах делимости биномиальных коэффициентов. *Записки научных семинаров ЛОМИ АН СССР*, 67:167–183, 1977. English translation: A class of

primality criteria formulated in terms of the divisibility of binomial coefficients. *J. Soviet Math.*, 16(1):874–885, 1981. MR 57, #3060.

- [30] Простые числа перечисляются полиномом от 10 переменных. *Записки научных семинаров ЛОМИ АН СССР*, 68:62–82, 1977. English translation: Primes are non-negative values of a polynomial in 10 variables. *J. Soviet Math.*, 15:33–44, 1981. Zbl 446.10046.
- [31] Some purely mathematical results inspired by mathematical logic. In *Proc. Fifth Intern. Congr. Logic, Methodology and Philos. of Sci. (London, Ont., 1975)*, pages 121–127, Dordrecht, 1977. Reidel. MR 58, #5508.
- [32] Алгоритмическая неразрешимость экспоненциально диофантовых уравнений с тремя неизвестными. In *Теория алгорифмов и математическая логика*, A.A. Markov and V.I. Homich, eds, Moscow, 69–78, 1979. English translation: Algorithmic unsolvability of exponential Diophantine equations in three unknowns. *Selecta Math. Sovietica*, 3(3):223–232, 1983/84. MR 81f:03055, 81b:03003.
- [33] What should we do having proved a decision problem to be unsolvable? *Lecture Notes in Computer Science*, 122:441–443, 1981.
- [34] (with J.P.Jones) Exponential Diophantine representation of recursively enumerable sets. *Studies in Logic and Foundations of Mathematics*, 107:159–177, 1982. MR 85i:03138.
- [35] (with J.P.Jones) A new representation for the symmetric binomial coefficient and its applications. *Ann. Sci. Math. Quebec*, 6:81–97, 1982. MR 84g:03060. Zbl 499.03028.
- [36] Еще один машинный эксперимент в пользу гипотезы Римана. *Кибернетика*, 6:10,22, 1982. English translation: Yet another machine experiment in support of Riemann’s Hypothesis. *Cybernetics*, 18(6):705–707, 1983. MR 716432 (85g:11079). Zbl 0516.10032.
- [37] (with J.P.Jones) Direct translation of register machines into exponential Diophantine equations. In L. Priese, editor, *Report First GFI Workshop Found. Theor. Computer Sci.*, pages 117–130. Univ. Gesamthochschule, Paderborn, 1983.

- [38] Одно аналитическое представление для суммы величин, обратных к нетривиальным нулям дзета-функции Римана. *Труды Матем. ин-та АН СССР*, 163:181–182, 1984. English translation: An analytic representation for the sum of reciprocals of the nontrivial zeros of the Riemann zeta-function. *Proc. Steklov Inst. Math.*, 163:211–213, 1985. MR MR769884 (86d:11069). Zbl 551.10030.
- [39] (with J.P.Jones) Register machine proof of the theorem on exponential Diophantine representation of enumerable sets. *J. Symbolic Logic*, 49:818–829, 1984. MR 758933 (85i:03139). Zbl 0599.03043.
- [40] (with A.N. Terekhov) 16-разрядная виртуальная машина, ориентированная на АЯВУ (16-bit virtual computer oriented to high level programming languages). In *Программирование микропроцессорной техники*. Институт Кибернетики АН ЭССР, Таллин, 68–72, 1984.
- [41] Об исследованиям по некоторым алгоритмическим проблемам алгебры и теории чисел. *Труды Матем. ин-та АН СССР*, 168:218–235, 1984. English translation: On investigations of some algorithmic problems of algebra and number theory. *Proc Steklov Inst. Math.*, 168(3):227–252, 1986. MR MR755902 (85k:01040). Zbl 597.03020.
- [42] A posteriori interval analysis. *Lecture Notes in Computer Science*, 204:328–334, 1985. MR 826570. Zbl 0581.65031.
- [43] A posteriori version of interval analysis. In *Proc Fourth Hungarian Computer Sci. Conf.*, pages 339–349. Budapest, 1986. MR 844351 (87i:65075).
- [44] вещественные числа и ЭВМ (Real numbers and computers). *Кибернетика и вычислительная техника*, 2:104–133, 1986.
- [45] (with R. K. Guy) A new formula for π . *Amer. Math. Monthly*, 93:631–635, 1986. MR MR1712797 (2000i:11199). Zbl 0614.10003.
- [46] Возможные нетрадиционные методы установления выполнимости пропозициональных формул. *Вопросы кибернетики*, 131:87–90, 1987. English translation: Possible nontraditional methods of establishing unsatisfiability of propositional formulas. *Amer. Math. Soc. Transl. Ser. 2*, 178:75–77, 1997. MR 0931066 (89g:03013), 1423610.

- [47] Диофанта сложность. *Записки научных семинаров ЛОМИ АН СССР*, 174:122–131, 1988. English translation: Diophantine complexity. *Journal of Soviet Mathematics*, 55(2):1603–1610, 1991. MR 976176 (90f:03078). Zbl 679.03016.
- [48] Связи между некоторыми суммами по тривиальным и нетривиальным нулям дзета-функции Римана. *Математические заметки*, 45(2):65–70, 1989. English translation: A relationship between certain sums over trivial and nontrivial zeros of the Riemann zeta-function. *Math. Notes*, 45(1/2):131–135, 1989. MR 1002519 (90d:11099). Zbl 0663.10041.
- [49] (with A. N. Terekhov and B. A. Fedotov) Унификация математического обеспечения для микроЭВМ на базе виртуальной машины. *Автоматика и телемеханика*, 5:168–175, 1990. English translation: Standardization of microcomputer software using virtual-machine design. *Autom. Remote Control*, 51(5):710–716, 1990. Zbl 800.68321.
- [50] The Riemann Hypothesis from a logician’s point of view. In R.A.Mollin, editor, *Proc. First Conf. Canadian Number Theory Assoc.*, pages 387–400, Berlin–New York, 1990. Walter de Gruyter. MR 1106674 (92f:11119). Zbl 697.10050.
- [51] (with J. P. Jones) Basis for the polynomial time computable functions. In Mollin R. A. editor, *Proc. First Conf. Canadian Number Theory Assoc.*, pages 255–270, Berlin–New York, 1990. Walter de Gruyter. MR 1106666 (93d:03046). Zbl 693.03023.
- [52] (with J. P. Jones) Proof of recursive unsolvability of Hilbert’s tenth problem. *American Mathematical Monthly*, 98:689–709, 1991. Zbl 746.03006.
- [53] Десятая проблема Гильберта. Наука, Moscow, 1993. ISBN 5-02-014326-X. English edition: *Hilbert’s Tenth Problem*. MIT Press, Cambridge, Massachusetts, 1993, ISBN 0-262-13295-8. French edition: *Le dixième problème de Hilbert. Son indécidabilité*. Masson, Paris, Milan, Barcelone, 1995, ISBN 2-225-84835-1. MR 1244324 (94m:03002b), 1247235 (94m:03002a). Zbl 0790.03008, 0790.03009. Homepage of the book: <http://logic.pdmi.ras.ru/~yumat/H10Pbook>.

- [54] A direct method for simulating partial recursive functions by Diophantine equations. *Annals Pure Appl. Logic*, 67(1-3):325–348, 1994. Zbl 795.03054.
- [55] Les équations-bricolageurs. *Revue de Mathématiques Spéciales*, 5:305–309, 1994. ISSN 0035-1504.
- [56] Interval computations as propagation of constraints. In Brian Mayoh, Enn Tyugu, and Jaan Penjam, editors, *Constraint programming: Proceedings of the NATO Advanced Study Institute on Constraint Programming, held Aug. 13–24, 1993 in Pärnu, Estonia*, volume 131 of *NATO ASI series. Series F, Computer and systems science*, pages 140–152, Berlin, Germany / Heidelberg, Germany / London, UK / etc., 1994. Springer-Verlag. Zbl 810.65041.
- [57] Новая техника для получения диофантовых представлений путем устранения ограниченных кванторов общности. *Записки научных семинаров ПОМИ АН СССР*, 220:83–92, 1995. English translation: A new technique for obtaining Diophantine representations via elimination of bounded universal quantifiers. *J. Math. Sci.*, 87(1):3228–3233, 1997. MR 1374097 (97h:03071).
- [58] Word problem for Thue systems with a few relations. *Lecture Notes in Computer Science*, 909:39–53, 1995. MR 1381720 (96k:03102).
- [59] (with Géraud Sénizergues) Decision problems for semi-Thue systems with a few rules. In *Proceedings, 11th Annual IEEE Symposium on Logic in Computer Science (LICS)*, pages 523–531, New Brunswick, New Jersey, 27–30 July 1996. IEEE Computer Society Press. MR 1461864.
- [60] (with Anatoli Degtyarev and Andrei Voronkov) Simultaneous rigid E -unification and related algorithmic problems. In *Proceedings, 11th Annual IEEE Symposium on Logic in Computer Science (LICS)*, pages 494–502, New Brunswick, New Jersey, 27–30 July 1996. IEEE Computer Society Press. MR 1461861.
- [61] (with Patrick Cegielski and Denis Richard) Definability and decidability issues in extensions of the integers with the divisibility predicate. *Journal of Symbolic Logic*, 61(2):515–540, 1996. Zbl 868.11061.

- [62] Вычисление обобщенных полиномов Чебышева на компьютере. *Вестник МГУ*, 6:59–61, 1996. English translation: Computer evaluation of generalized Chebyshev polynomials. *Mosc. Univ. Math. Bull.*, 51(6):39–40, 1996. Zbl 892.41017.
- [63] Mots et codes: Cas décidables et indécidables du problème du codage pour les monoïdes partialement commutatifs. *Quadrature*, 27:23–33, 1997. ISSN 1142-2785.
- [64] Some decision problems for traces. *Lecture Notes in Computer Science*, 1234:248–257, 1997. MR 1616196. Zbl 980.17125.
- [65] (with Volker Diekert and Anca Muscholl) Solving trace equations using lexicographical normal forms. *Lecture Notes in Computer Science*, 1256:336–347, 1997.
- [66] Hilbert’s tenth problem: A two-way bridge between number theory and computer science. In C. S. Calude, editor, *People and Ideas in Theoretical Computer Science*, Springer series in discrete mathematics and theoretical computer science, pages 177–204. Springer-Verlag, Singapore, 1999. MR 1734859. Zbl 1125.11302.
- [67] (with Maurice Margenstern) A binomial representation of the $3x + 1$ problem. *Acta Arithmetica*, 91(4):367–378, 1999. MR 1736018 (2001g:11015). Zbl 0968.11011.
- [68] (with Volker Diekert and Anca Muscholl) Solving word equations modulo partial commutations. *Theoretical Computer Science*, 224:215–235, 1999. MR 1714796 (2001g:03023). Zbl 0930.68074.
- [69] Hilbert’s tenth problem: What was done and what is to be done. *Contemporary Mathematics*, 270:1–47, 2000. MR 1802008 (2001m:03084). Zbl 0994.03002.
- [70] Some arithmetical restatements of the four color conjecture. *Theoretical Computer Science*, 257(1–2):167–183, 2001. MR 1825093 (2002f:03107). Zbl 0979.05049.
- [71] Некоторые алгебраические методы вычисления количества раскрасок графов. *Записки научных семинаров ПОМИ АН СССР*, 283:193–205, 2001. English translation: Some algebraic methods for calculat-

- ing the number of colorings of a graph. *J. Math. Sci., New York*, 121(3):2401–2408, 2001. MR 1879070 (2002i:05046). Zbl 1063.05046.
- [72] (with Luc Boasson, Patrick Cegielski and Irene Guessarian) Window-accumulated subsequence matching problem is linear. *Annals Pure Applied Logic*, 113:59–80, 2002. MR 1875736 (2003b:68082). Zbl 0998.68042.
- [73] Диофантово представление чисел Бернулли и его приложения. *Труды Математического института им. В.А.Стеклова РАН*, 242:98–102, 2003. English translation: A Diophantine representation of Bernoulli numbers and its applications. *Proc. Steklov Inst. Math.*, 2003. MR 2054487 (2005e:11028). Zbl 1118.11013.
- [74] Один вероятностный эквивалент гипотезы четырех красок. *Теория вероятностей и ее применения*, 48:411–416, 2003. English translation: One probabilistic equivalent of the four color conjecture. *Theory of Probability and Its Applications*, 48(2):368–372, 2004. MR 2015463 (2004i:05056). Zbl 1052.05044.
- [75] Elimination of quantifiers from arithmetical formulas defining recursively enumerable sets. *Mathematics and Computers in Simulation*, 67:125–133, 2004. MR 2088903 (2005d:03057). Zbl 1073.6889.
- [76] Some probabilistic restatements of the four color conjecture. *J. Graph Theory*, 46:166–179, 2004. MR 2063367 (2005d:05066). Zbl 1053.05050.
- [77] Hilbert’s tenth problem and paradigms of computation. *Lecture Notes in Computer Science*, 3526:310–321, 2005. Zbl 1115.03004.
- [78] (with G. Senizergues) Decision problems for semi-Thue systems with a few rules. *Theoretical Computer Science*, 330:145–169, 2005. MR 2112772 (2006c:03059). Zbl 1078.03033.
- [79] (with Patrick Cegielski and Irene Guessarian and Yury Lifshits) Window subsequence problem for compressed texts. *Lecture Notes in Computer Science*, 3967:127–136, 2006. MR 2260988 (2007f:68231). Zbl pre05148720.

- [80] Diophantine flavor of Kolmogorov complexity. *Transactions of the Institute for Informatics and Automation Problems of the National Academy of Sciences of Armenia*, 27:111–122, 2006. ISSN 0131-4645.
- [81] (with Patrick Cégielski and Irène Guessarian) Multiple serial episodes matching. *Inform. Process. Lett.*, 98(6):211–218, 2006. MR MR2221532 (2007m:68323).
- [82] Hidden life of Riemann’s zeta function 1. Arrow, bow, and targets. <http://arXiv.org/abs/0707.1983>, 2007.
- [83] Hidden life of Riemann’s zeta function 2. Electrons and trains. <http://arXiv.org/abs/0709.0028>, 2007.
- [84] Riemann’s zeta function: Some computations and conjectures. In A.-M. Ernvall-Hytönen, M. Jutila, J Karhumäki, and A. Lepistö, editors, *Proceedings of Conference on Algorithmic Number Theory 2007*, pages 87–112, Turku, 2007. Turku Centre for Computer Science.
- [85] Riemann’s zeta function: More computations and conjectures. In Anatanas Laurinčikas and Jörn Steuding, editors, *Voronoi’s Impact on Modern Science. Proceedings of the 4th International Conference on Analytical Number Theory and Spacial Tesselations*, pages 2–11. Drahomanov National Pedagogical University, Kiev, Ukraine, 2008.
- [86] (with Patrick Cégielski and Irène Guessarian) Tree inclusion problems. *Theor. Inform. Appl.*, 42(1):5–20, 2008. MR MR2382541 (2008m:68053). Zbl 1149.68040.
- [87] Computation paradigms in light of Hilbert’s tenth problem. In S. Barry Cooper, Benedikt Löwe, and Andrea Sorbi, editors, *New Computational Paradigms. Changing Conceptions of What is Computable*, pages 59–86. Springer-Verlag, 2008. ISBN 978-0-387-36033-1.
- [88] Existential arithmetization of Diophantine equations. *Ann. Pure Appl. Logic*, 157(2-3):225–233, 2009. MR MR2499711.
- [89] (with Vesa Halava and Jarkko Kari) On Post correspondence problem for letter monotonic languages. *Theoretical Computer Science*, 410(30-32):2957–2960, 2009.