



UDC 511.34

On an Additive Problem with Squarefree Numbers

D. V. Goryashin

Moscow State University, Russia, 199991, Moscow, Leninskie Gory, 1, goryashin@mech.math.msu.su

An asymptotic formula for the number of representations of a positive integer N in the form $q_1 + q_2 + [\alpha q_3]$ is obtained, where q_1, q_2, q_3 are squarefree numbers and $\alpha > 1$ is a fixed irrational algebraic number.

Key words: ternary problem, squarefree numbers, asymptotic formula.

References

1. Vinogradov I. M. Representation of an Odd Number as a Sum of Three Primes. *Doklady AN USSR*. 1937, vol. 15, pp. 291–294 (in Russian).
2. Fatkina S. Yu. On the representation of a natural number as a sum of three almost equal terms generated by primes. *Russian Mathematical Surveys* [Uspekhi Mat. Nauk], 2000, vol. 55, no. 1, pp. 171. DOI: 10.1070/RM2000v055n01ABEH000254.
3. Evelyn C. J. A., Linfoot E. H. On a problem in the additive theory of numbers. I : *Math. Z.* 1929, vol. 30, pp. 433–448; II : *J. Reine Angew. Math.*, 1931, vol. 164, pp. 131–140; III : *Math. Z.*, 1932, vol. 34, pp. 637–644; IV : *Ann. of Math.*, 1931, vol. 32, pp. 261–270; V : *Quart. J. Math.*, 1932, vol. 3, pp. 152–160; VI : *Quart. J. Math.*, 1933, vol. 4, pp. 309–314.
4. Brüdern J., Perelli A. Exponential Sums and Additive Problems Involving Square-free Numbers. *Ann. Scuola Norm. Sup. Pisa Cl. Sci. (4)*, 1999, vol. XXVIII, pp. 591–613.
5. Arkhipov G. I., Buriev K., Chubarikov V. N. On the power of a singular set in binary additive problems with prime numbers. *Proc. Steklov Inst. Math.*, 1997, vol. 218, pp. 23–52.
6. Arkhipov G. I., Chubarikov V. N. On the exceptional set in a Goldbach-type binary problem. *Dokl. Math.* [Dokl. Akad. Nauk], 2002, vol. 66, no. 3, pp. 338–339.
7. Brüdern J., Granville A., Perelli A., Vaughan R. C., Wooley T. D. On the exponential sum over k -free numbers. *Philos. Trans. Roy. Soc. London Ser. A*, 1998, vol. 356, pp. 739–761.
8. Tolev D. I. On the exponential sum with square-free numbers. *Bull. London Math. Soc.*, 2005, vol. 37, pp. 827–834. DOI: 10.1112/S0024609305004753.
9. Schlage-Puchta J. C. The exponential sum over squarefree integers. *Acta Arith.*, 2004, vol. 115, pp. 265–268. DOI: 10.4064/aa115-3-7.
10. Popov O. V. Arithmetic applications for estimates of Weyl sums of polynomials of increasing degree. *Fundam. Prikl. Mat.*, 1998, vol. 4, no. 2, pp. 595–640 (in Russian).
11. Goryashin D. V. Squarefree numbers in the sequence $[\alpha n]$. *Chebyshevskii Sb.*, 2013, vol. 14, no. 3 pp. 60–66 (in Russian).
12. Arkhipov G. I., Chubarikov V. N. On the measure of «large arcs» in the Farey partition. *Chebyshevskii Sb.*, 2011, vol. 12, no. 4, pp. 39–42.
13. Brüdern J., Cook R. J., Perelli A. The Values of Binary Linear Forms at Prime Arguments. *Sieve Methods, Exponential Sums and Their Applications in Number Theory*. Cambridge, Cambridge Univ. Press, 1997, pp. 87–100.