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# THE P-FROBENIUS NUMBER FOR THE TRIPLE OF CERTAIN QUADRATIC NUMBERS

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## ABSTRACT

We give closed-form expressions of the  $p$ -Frobenius number for the triple of the numbers  $an(n-1)+r$  for an integer  $a$  and  $|r|$  is odd. For the set of given positive integers  $A := \{a_1, a_2, \dots, a_k\}$ , the  $p$ -Frobenius number is the largest integer whose nonnegative integral linear combinations of given positive integers in  $A$  are expressed in at most  $p$  ways. When  $p=0$ , the 0-Frobenius number is the classical Frobenius number, which is the central topic of the famous linear Diophantine problem of Frobenius.

**Keywords** Frobenius problem · Frobenius numbers · quadratic numbers

## References

- [1] Komatsu, T., Pita-Ruiz, C.: The Frobenius number for Jacobsthal triples associated with number of solutions. *Axioms* 12 (2), Article 98, 18 pages (2023). <https://doi.org/10.3390/axioms12020098>
- [2] Rosales, J. C., Branco, M. B., Torralba, D.: The Frobenius problem for Mersenne numerical semigroups. *Math. Z.* 286, 741–749 (2017).
- [3] Matone M., Volpato, R.: Vector-valued modular forms from the Mumford forms, Schottky-Igusa form, product of Thetanullwerte and the amazing Klein formula. *Proc. Amer. Math. Soc.* 141, 2575–2587 (2013).

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