

The Diophantine Frobenius Problem: Past, Present and Future

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Abstract

The Frobenius problem asks for the largest monetary amount that cannot be obtained using only coins of specified denominations. The solution to this problem for a given set of coin denominations is called the Frobenius number of the set. There is an explicit formula for the Frobenius number when there are only two different coin denominations. If the number of coin denominations is three or more, no explicit formula is known. In this talk, we survey the history of this very rich problem. We discuss the major progress done so far and some of the techniques used to tackle it from numerical semigroups, to denumerants, to convex polytopes and many others. Finally, we mention some future directions for research along those lines.

Keywords: Frobenius problem, Frobenius number, coin denominations.