

A classification of Markoff-Fibonacci m-triples

D. Alfaya Sánchez; L.A. Calvo Pascual; A. Martínez de Guinea García; J. Rodrigo Hitos; A. Srinivasan

Abstract-

We classify all solution triples with Fibonacci components to the equation $a^2 + b^2 + c^2 = 3abc + m$, for positive m . We show that for $m = 2$ they are precisely $(1, F(b), F(b + 2))$, with even b ; for $m = 21$, there exist exactly two Fibonacci solutions $(1, 2, 8)$ and $(2, 2, 13)$ and for any other m there exists at most one Fibonacci solution, which, in case it exists, is always minimal (i.e. it is a root of a Markoff tree). Moreover, we show that there is an infinite number of values of m admitting exactly one such solution.

Index Terms- Markoff triples; generalized Markoff equation; Fibonacci solutions

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