

Christian Ballot

Divisibility of Fibonomials and Lucasnomials via A General Kummer Rule,

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Abstract

Marques et al. have recently studied some specific Fibonomial divisibility questions. For instance, they determined all integers $n \geq 1$ such that the Fibonomial $\binom{3n}{n}_F$ is divisible by 3. We reexamine those questions with the Kummer-like rule established by Knuth and Wilf for Fibonomials. After stating a Kummer result valid for all primes and Lucasnomials, i.e., generalized binomials $\binom{*}{*}_U$ with U a fundamental Lucas sequence, we obtain broad divisibility theorems for Lucasnomials along the line of Marques et al. original questions.