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Some Properties of Oresme Numbers and Convolutions with Various Second Order Sequences,

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Abstract

The Cauchy convolution for the Oresme numbers and Fibonacci, Lucas, Pell, Pell-Lucas, Jacobsthal, and Jacobsthal-Lucas numbers are investigated. The convolutions leading to various congruences with expressions involving Fibonacci, Lucas, Pell, Pell-Lucas, Jacobsthal, and Jacobsthal-Lucas numbers are studied.

Various new properties of Oresme numbers are proven and formulas for computing the generating functions of these convolutions are obtained and shown to agree with the product of Oresme and Fibonacci, et al., sequence generating functions.