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Congruences and identities for some second-order linear homogeneous recurrent sequences.
(English) Zbl 1423.11040

Summary: In this paper, we study few properties of the second-order linear homogeneous recurrent sequence \((u_n)_n\) with constant coefficients in a complete valued field extension of the field of \(p\)-adic numbers. More precisely, we give the necessary and sufficient condition satisfied by \((u_n)_n\) to be the moment sequence of an appropriate \(p\)-adic measure. Furthermore, we establish identities and congruences for Fibonacci numbers, and for some \(p\)-adic values of Chebyshev polynomials. Some ones are well known and others, for instance Kurnmer like congruences, seem to be new.

MSC:
11B50 Sequences (mod \(m\))
11B37 Recurrences
11S80 Other analytic theory (analogues of beta and gamma functions, \(p\)-adic integration, etc.)

Keywords:
\(p\)-adic measure; moment sequences; exponential generating function; Laplace transform; congruences; identities; Chebyshev polynomials; Fibonacci numbers; Lucas numbers; second-order linear recurrent sequences