Lawrence Somer and Michal Křížek

On Moduli for Which Certain Second-Order Linear Recurrences Contain a Complete System of Residues Modulo \( m \),

Abstract

Let \( u(a, b) \) denote the Lucas sequence defined by the second-order recursion relation \( u_{n+2} = au_{n+1} + bu_n \) with initial terms \( u_0 = 0 \) and \( u_1 = 1 \), where \( a \) and \( b \) are integers. The positive integer \( m \) is said to be nondefective if \( u(a, b) \) contains a complete system of residues modulo \( m \). All possibilities for \( m \) to be nondefective are found when \( b = \pm 1 \). This paper generalizes results of S. A. Burr for the Fibonacci sequence \( u(1, 1) \).