CONFEDERATION OF PELL AND HALF-COMPANION PELL SEQUENCES THROUGH CONGRUENCES AND DIVISIBILITY

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Abstract: In this manuscript, the features of Pell and Half-companion Pell sequences combined together with respect to congruences and divisibility are investigated by means of several relations linking these two considered sequences.

1. Introduction

The Pell sequence $\{R_t\}$ and Half-companion Pell sequence $\{S_t\}$ sustaining the subsequent identities $R_t = 2R_{t-1} + R_{t-2}$, $t \geq 2$ where $R_0 = 0$, $R_1 = 1$, $S_t = 3R_{t-1} + R_{t-2}$, $t \geq 2$ are two interconnected sequences respectively. They are also signified by the equations $2\sqrt{2}R_t = u^x + v^y$, $2S_t = u^x + v^y$, where $x, y \in Z$, $u = 1 + \sqrt{2}$ and $v = 1 - \sqrt{2}$. In [5], the author explored the matrix format of the Jacobsthal-Lucas numbers. In [3, 4], congruence relations involving Fibonacci and Lucas numbers of the form cx^2 are evaluated. Some results of Pell and Half-companion Pell sequences are discovered by the corresponding authors in [1]. In [2, 6, 7, 8], the interrelatedness amid Pell Padovan and Perrin numbers are unveiled.