

1089-11-163

Hugh C Williams* (hwilliam@ucalgary.ca) and **Richard K Guy**. *Some Interesting Linear Divisibility Sequences of Order Four*.

A sequence of rational integers is said to be a divisibility sequence if the m th term always divides the n th term whenever m divides n . If the divisibility sequence also satisfies a linear recurrence relation, it is said to be a linear divisibility sequence of order k , where k is the degree of its characteristic polynomial. The best known example of a linear divisibility sequence of order 2 is the Lucas sequence, one particular instance of which is the famous Fibonacci sequence. In such sequences we know that if a given prime p divides the n th term, then n must be divisible by a certain integer r , depending on p , called the rank of apparition of p . However, in the case of divisibility sequences of order greater than 2 there can in general be more than one rank of apparition with respect to a given prime p . In their extension of the Lucas functions to order 4 linear recursions, Williams and Guy (2011) showed that order 4 analogs of the Lucas sequence can have no more than two ranks of apparition for a given prime p and frequently have two such ranks. In this paper we investigate the problem of determining for these sequences those which have only one rank of apparition for any prime p and those which must have two ranks infinitely often. (Received February 12, 2013)