



## NUMBER THEORY SESSION

# INTEGRAL VALUES OF GENERATING FUNCTIONS OF RECURRENCE SEQUENCES.

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14h - 14h40

Online

### Abstract.

Suppose that  $a_0, a_1, \dots$  is an integer sequence which satisfies a recurrence relation with constant coefficients, and let  $T(x) = f(x)/g(x)$  be its generating function, where  $f(x)$  and  $g(x)$  have no common factors in  $\mathbb{Z}[x]$ . In this talk, we study the problem of finding the rational values of  $x$  such that  $T(x)$  is an integer. We say that such a number is *good* for the sequence. Our first main result is that if  $g(x)$  has at least two different irreducible factors, or if  $g(x)$  has a single irreducible factor of degree at least 3, then the sequence has only finitely many good values. We also study sequences of the form  $0, 1, \dots$  for which the recurrence relation has order 2. Among other results, we show that under a mild condition on the recurrence relation, the sequence has infinitely many good values, and we give a constructive method to find all of them.

JOINT WORK WITH MICHAEL KNAPP AND ABÍLIO LEMOS.

**Keywords:** Generating function, Recurrence sequences, Diophantine equations.

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