

A new combinatorial approach to polynomial recurrence modulo 1

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For a given real number x consider the "orbit" of positive integer multiples of x , namely $x, 2x, 3x, 4x, \dots$, ask yourself the question: How long does one have to wait until one of these multiple of x will lie within epsilon of an integer? What if we only consider perfect square multiples of x , namely $x, 4x, 9x, 16x, \dots$?

We will discuss the answers to these questions and more, place them in some historical context, and present a new (elementary) combinatorial approach to simultaneous quadratic recurrence, which is joint work with Ernie Croot and Alex Rice.