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Title: Erdős–Surányi sequences and trigonometric integrals

Author(s): Liam Baker and Stephan Wagner

We study representations of integers as sums of the form $\pm a_1 \pm a_2 \pm \cdots \pm a_n$, where $a_1, a_2, \ldots$ is a prescribed sequence of integers. Such a sequence is called an Erdős–Surányi sequence if every integer can be written in this form for some $n \in \mathbb{N}$ and choices of signs, in infinitely many ways. We study the number of representations of a fixed integer, which can be written as a trigonometric integral, and obtain an asymptotic formula under a rather general scheme due to Roth and Szekeres. Our approach, which is based on Laplace's method for approximating integrals, can also be easily extended to find higher-order expansions. As a corollary, we settle a conjecture of Andrica and Ionaşcu on the number of solutions to the signum equation $\pm 1^k \pm 2^k \pm \cdots \pm n^k = 0$.

Address:
Liam Baker
Department of Mathematical Sciences
Stellenbosch University
Private Bag X1
Matieland 7602
South Africa

Address:
Stephan Wagner newline Department of Mathematical Sciences
Stellenbosch University
Private Bag X1
Matieland 7602
South Africa