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Lineability and additivity cardinals for real-valued functions: old results and new developments

Abstract

In the talk we will discuss several cardinal coefficients related to the linear structure of the classes of functions from X to $\mathbb{R}$ which, in their entirety, do not form linear spaces. In particular, we will examine: the *additivity number* $A(M)$, defined as the minimum cardinality of a family $F \subset \mathbb{R}^X$ for which there is no $f \in \mathbb{R}^X$ with $f + F \subset M$; the *lineability number* $\mathcal{L}(M)$, defined as the smallest cardinal number κ for which $M \cup \{0\}$ contains no vector space of dimension κ; as well as the *maximal lineability,* $\mathrm{m}\mathcal{L}(M)$ and *homogeneous lineability,* $\mathcal{HL}(M)$ numbers. We will describe the relations between these coefficients and give their values for some well studied classes of functions.