The non-existence of a Hamel-basis and the general solution of Cauchy's functional equation for nonnegative numbers (In English)

There is a new field of research in the theory of functional equations to give the solution on restricted domains. E. g., in many applications, the Cauchy's functional equation can be supposed valid only for nonnegative values of the variables. In this case the authors define the solution by $f(x) = -f(-x)$ also for $x < 0$ and show that the so extended $f(x)$ satisfies the Cauchy's functional equation for arbitrary real values of the variables hence the solution on the restricted domain can be given by restricting $f(x)$ to nonnegative x's. They prove that there does not exist any set of nonnegative numbers the nonnegative rational, finite linear combinations of which represent each of the nonnegative numbers in a unique way.

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