

Problems concerning quasi-arithmetic means

-Abstract-

Borbála Csík

Quasi-arithmetic means form a special class of means. These means are defined using a strictly monotonic and continuous function, which is referred to as the generator function of the mean.

We begin by clarifying the relevant concepts, followed by addressing naturally arising questions within this topic. We examine issues concerning the equality, homogeneity, translatability, and comparability of quasi-arithmetic means. The central focus of this thesis is the so-called Matkowski-Sutô problem, which also requires an understanding of the concept of Gauss composition. Since the original problem is quite complex, we instead solve a simpler, yet similarly interesting and equivalent version of it, under an additional condition.

Finally, we present theorems associated with the names of Cauchy and Jensen, which have contributed significantly to many results in this field. This is because questions related to quasi-arithmetic means are often reducible to one of these theorems.

The aim of this thesis is therefore to provide a thorough and precise exploration of the theory of quasi-arithmetic means, tracing the development of results from fundamental properties to more advanced theorems. In addition, we offer insights into potential future research directions within this area.