Title: On the equality of generalized quasi-arithmetic means

Author(s): Zita Makó and Zs. Páles

Given a continuous strictly monotone function $\varphi : I \to R$ and a probability measure μ on the Borel subsets of $[0,1]$, the two variable mean $M_{\varphi,\mu} : I^2 \to I$ is defined by

$$M_{\varphi,\mu}(x,y) := \varphi^{-1}\Big(\int_0^1 \varphi\big(tx + (1-t)y\big)d\mu(t)\Big) \quad (x,y \in I.$$

This class of means includes quasi-arithmetic as well as Lagrangian means. The aim of this paper is to study their equality problem, i.e., to characterize those pairs (φ, μ) and (ψ, ν) such that

$$M_{\varphi,\mu}(x,y) = M_{\psi,\nu}(x,y) \quad (x,y \in I$$

holds. Under at most fourth-order differentiability assumptions for the unknown functions φ and ψ, a complete description of the solution set of the above functional equation is obtained.

Address:
Zita Makó
Institute of Mathematics
University of Debrecen
H-4010 Debrecen, Pf. 12
Hungary
E-mail: zmako@math.klte.hu

Address:
Zs. Páles
Institute of Mathematics
University of Debrecen
H-4010 Debrecen, Pf. 12
Hungary
E-mail: pales@math.klte.hu