Poincare Journal of Analysis & Applications
Vol. 2018 (2(I)), 77-85

Hermite-Hadamard type inequalities for multiplicatively geometrically P-functions

MAHIR KADAKAL†, HALIL KARACA AND İMDAT İŞCAN

Date of Receiving	:	11.12.2018
Date of Revision	:	25.12.2018
Date of Acceptance	:	25.12.2018

Abstract. In this paper, we introduce a new class of extended multiplicatively geometrically P-function. Some new Hermite-Hadamard type inequalities are derived. Results represent significant refinement and improvement of the previous results.

1. Preliminaries and Fundamentals

Definition 1.1. A function $f : I \subseteq \mathbb{R} \to \mathbb{R}$ is said to be convex if the inequality

$$f(tx + (1-t)y) \leq tf(x) + (1-t)f(y)$$

is valid for all $x, y \in I$ and $t \in [0,1]$. If this inequality reverses, then the function f is said to be concave on interval $I \neq \emptyset$.

This definition is well known in the literature. Convexity theory has appeared as a powerful technique to study a wide class of unrelated problems in pure and applied sciences.

One of the most important integral inequalities for convex functions is the Hermite-Hadamard inequality. The classical Hermite–Hadamard inequality provides estimates of the mean value of a continuous convex function $f : [a,b] \to \mathbb{R}$. The following double inequality is well known as the Hadamard inequality in the literature.

Definition 1.2. $f : [a,b] \to \mathbb{R}$ be a convex function, then the inequality

$$f\left(\frac{a+b}{2}\right) \leq \frac{1}{b-a}\int_a^b f(x)dx \leq \frac{f(a)+f(b)}{2}$$

is known as the Hermite-Hadamard inequality.

2010 *Mathematics Subject Classification.* 26A51, 26D10, 26D15.
Key words and phrases. Convex function, Multiplicatively P-function, Multiplicatively Geometrically P-function, Hölder Integral inequality and Power-Mean Integral inequality, Hermite-Hadamard type inequality.
Communicated by: Nikhil Khanna
†Corresponding author.