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INEQUALITY OF HARDY-TYPE FOR n -CONVEX FUNCTION VIA INTERPOLATION POLYNOMIAL AND GREEN FUNCTIONS

DORA POKAZ

Abstract. We obtain new results on the Hardy-type inequality in the general context, in terms of measure spaces with positive σ -finite measures. The connection is made between the difference operator derived from the Hardy-type inequality on the one hand and the expression containing the interpolating polynomial of Abel-Gontscharoff and the four Green functions on the other hand. We discuss the n -convexity of the function and consider the result depending on the parity of the indexes n and m . Further results are obtained by using the Hölder inequality for conjugate exponents p and q . Finally, we derive upper bounds for the remainder, obtained from the main result, using the Čebyšev functional. The Ostrowski-type bound for the generalized Hardy inequality is also given.

Mathematics subject classification (2020): 26D10, 26D15, 39B62.

Keywords and phrases: Convex function, Hardy-type inequality, Abel-Gontscharoff interpolating polynomial, Green function, Čebyšev functional.

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