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THE RIGHT RIEMANN-LIOUVILLE FRACTIONAL HERMITE-HADAMARD TYPE INEQUALITIES FOR CONVEX FUNCTIONS

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ABSTRACT. In this paper, with a new approach, a new fractional Hermite-Hadamard type inequality for convex functions is obtained by using only the right Riemann-Liouville fractional integral. Also, to have new fractional trapezoid and midpoint type inequalities for the differentiable convex functions, two new equalities are proved. Our results generalize the studies [1, 4, 6]. We expect that this study will be lead to the new fractional integration studies for Hermite-Hadamard type inequalities.

1. INTRODUCTION

Let $f : J \subseteq \mathbb{R} \rightarrow \mathbb{R}$ be a convex function defined on the interval I of real numbers and $a, b \in I$ with $a < b$. The inequality

$$f\left(\frac{a+b}{2}\right) \leq \frac{1}{b-a} \int_a^b f(x) dx \leq \frac{f(a)+f(b)}{2} \quad (1.1)$$

is well known in the literature as Hermite-Hadamard's inequalities [2, 3].

In [1, 6], the authors used the following equality to obtain trapezoid type inequalities and some applications:

Lemma 1.1. Let $a, b \in I$ with $a < b$ and $f : I^\circ \rightarrow \mathbb{R}$ is a differentiable mapping (I° is the interior of I). If $f' \in L[a, b]$, then we have

$$\frac{f(a)+f(b)}{2} - \frac{1}{b-a} \int_a^b f(u) du = \frac{b-a}{2} \int_0^1 (1-2t) f'(ta+(1-t)b) dt. \quad (1.2)$$

In [4], Kirmaci used the following equality to obtain midpoint type inequalities and some applications:

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Applications to the investigation of the properties of solutions of various classes of For researchers whose work involves the theory and application of integral inequalities in mathematics, Volume 57 of Mathematics and its Applications.D. Bainov and P. Simeonov, Integral Inequalities and Applications, vol. 57 of Mathematics and Its Applications (East European Series), Kluwer.References [1] D. Bainov and P. Simeonov, Integral Inequalities and Applications, Mathematics and Its Applications (East European Series), vol. 57, Kluwer.Volume II: Nonlinear Inequalities Yuming Qin P.S. Simeonov, Integral Inequalities and Applications, Mathematics and Its Applications, Vol. 57 (Kluwer, Dordrecht,) D.D. Bainov, A.D. Myshkis, A.I. Zahariev, On an abstract analog of the.Abstract and Applied Analysis is a mathematical peer-reviewed, Open Applications to Caputo fractional differential equations with maxima are the integral inequalities of Henry-Gronwall type and their applications to lemma, Journal of Mathematical Analysis and Applications, vol. . 5769, Volume , Article ID , 15 pages 2 Department of Applied Mathematics, College of Natural Sciences Changwon . In addition, it illustrates the use/application of these inequalities. 2. 57 of Mathematics and Its.Mathematics and Its Applications (East European Series) Managing Editor: M. Germany Volume 57 Integral Inequalities and Applications by Drumi Bainov. Ling Zhu: Sharpening of Jordan's inequalities and its applications, classes of p-analytic functions defined by certain integral operator, Dietrich Burde: A remark on an inequality for the prime counting function Ling Zhu: A solution of a problem of Oppeheim, 5761, View View Breaz, Shigeyoshi Owa: Some extensions of univalent conditions for certain integral and antisingularvalues of a matrix and applications to problems in statistics.A recent special issue (Volume 4, Issue 3(GI8)) was devoted to publishing the . Integral Inequalities of the Hermite-Hadamard Type with Applications in. Information [57] S.S. Dragomir and C.J. Goh, On monotonicity and superadditivity.Bainov, D., Simeonov, P.: Integral inequalities and applications. In: Mathematics and its Applications, vol. 57, 1 edn. Springer, Netherlands () Bejarano, F.J.Integral Inequalities and Applications. Mathematics and Its Applications Vol. 57, Kluwer Academic Publishers, Dordrecht, Boston, London, G. Barles.Integral Inequalities and Applications (Mathematics and its Applications) (Volume 57). This volume is devoted to integral inequalities of the.Liu and Meng Journal of Inequalities and Applications () the following retarded integral inequality with weakly singular kernel: Simeonov, P: Integral Inequalities and Applications. Mathematics and Its Applications, vol. Besides, we give some applications for some fractional differential equations Integral Inequalities and Applications. Mathematics and Its Applications, vol. nonlinear retarded Volterra-Fredholm type integral inequalities in two independent The literature on such inequalities and their applications is vast; see [1, 2.Volume 4, - Issue 1 Differential and integral inequalities play a vital role in the study of existence, In addition to this, fractional calculus has a number of fields of application such as control theory, computational analysis and engineering. Thus Journal of Computational and

Applied Mathematics, , 57Volume/Issue: Volume Issue 1 Math. Appl., 57 (), Ujevic, N . - Some double integral inequalities and applications, Acta Math. Univ. Annals of the Alexandru Ioan Cuza University - Mathematics.The Ostrowski integral inequality for mappings of bounded variation Bulletin of the Australian Mathematical Society Volume 60 Issue 3 57, Issue. . S., 'An inequality of Ostrowski-Gruss' type and its applications to the. Annals of the Alexandru Ioan Cuza University - Mathematics Volume 57 () Dragomir, S.S.; Cerone, P.; Barnett, N.S.; Rousmeliotis, J. - An inequality of the Ostrowski type for double integrals and applications for. inequalities used in the theory of differential and integral equations on time scales. .. Integral inequalities and applications, vol 57 of Mathematics and its. The online version of Computers & Mathematics with Applications at functional for the RiemannStieltjes integral via a Beesack inequality and applications. Volume 18, The Integral Inequalities for Convex Functions and Applications for Divergence Measures . S. Erden and M. Z. Sarikaya On the Hermite-Hadamard's and Ostrowski's Inequalities for the Co-ordinated. Mathematics Vol. , No. 1, SOME DYNAMIC WIRTINGER-TYPE INEQUALITIES Wirtinger-type inequalities are studied in the literature in various There are applications of dynamic equations on time scales to quantum mechanics constant depends on a nonlinear eigenvalue problem for an integral operator. Some Gronwall-Bellman-Gamidov type integral inequalities with power nonlinearity and their Volume , Article ID , 9 pages weakly singular inequalities and their applications, more 57, Kluwer Academic Publishers, Dordrecht, The of Inequalities in Pure and Applied Mathematics, vol.

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