

## ON HERMITE–HADAMARD TYPE INEQUALITIES FOR $F$ -CONVEX FUNCTIONS

MIROSLAW ADAMEK

**Abstract.** In this paper we give two different Hermite-Hadamard type inequalities for  $F$ -convex functions. As special cases of it we get known and new Hermite-Hadamard type inequalities for different concepts of convexity.

*Mathematics subject classification (2010):* 26D15, 26A51, 39B62.

*Keywords and phrases:*  $F$ -convex functions, generalized convexity, Hermite-Hadamard type inequalities.

### REFERENCES

- [1] M. ADAMEK, *On a problem connected with strongly convex functions*, Math. Inequal. Appl. **19**, 4 (2016), 1287–1293.
- [2] M. ADAMEK, *On Jensen type inequalities for  $F$ -convex functions*, accepted for publication in Math. Inequal. Appl.
- [3] M. ADAMEK, *Remark on  $F$ -convex functions*, J. Convex Analysis **20**, 1 (2021).
- [4] G. ALBERTI, L. AMBROSIO, P. CANNARSA, *On the singularities of convex functions*, Manuscripta Math., **76** (1992), 421–435.
- [5] S.S. DRAGOMIR, C.E.M. PEARCE, *Selected Topics on Hermite-Hadamard Inequalities and Applications*, RGMIA Monographs, Victoria University (2002) (<https://rgmia.vu.edu.au/monographs/>).
- [6] A. EL FARISSI, *Simple proof and refinement of Hermite-Hadamard inequality*, J. Math. Inequal., **4**, 3 (2010), 365–369.
- [7] J. HADAMARD, *Étude sur les propriétés des fonctions entières et en particulier d'une fonction considérée par Riemann*, J. Math Pures Appl., **58** (1893), 171–215.
- [8] M. KUCZMA, *An Introduction to the Theory of Functional Equations and Inequalities. Cauchy's Equation and Jensen's Inequality*, PWN-Uniwersytet Śląski, Warszawa-Katowice-Kraków, 1985, 2nd Edition: Birkhäuser, Basel-Boston-Berlin, 2009.
- [9] D.S. MITRINOVIĆ, I. B. LACKOVIĆ, *Hermite and convexity*, Aequat. Math. **28** (1985), 229–232.
- [10] N. MERTENS, K. NIKODEM, *Remarks on strongly convex functions*, Aequat. Math. **80** (2010), 193–199.
- [11] H.V. NGAI, D.T. LUC, M. THÉRA, *Approximate convex functions*, J. Nonlinear and Convex Anal., **1**, 2 (2000), 155–176.
- [12] C.P. NICULESCU, L.E. PERSSON, *Convex Functions and Their Applications. A Contemporary Approach*, Second Edition, CMS Bokks in Mathematics, Springer, 2018, 415+ xvii pp.
- [13] K. NIKODEM, ZS. PÁLES, *On  $t$ -convex functions*, Real Anal. Exchange, **29**, 1 (2003/2004), 219–228.
- [14] K. NIKODEM, ZS. PÁLES, *Characterizations of inner product spaces by strongly convex functions*, Banach J. Math. Anal. **5** (2011), no. 1, 83–87.
- [15] ZS. PÁLES, *On approximately convex functions*, Proc. Amer. Math. Soc., **131**, 1 (2003), 243–252.
- [16] B.T. POLYAK, *Existence theorems and convergence of minimizing sequences in extremum problems with restrictions*, Soviet Math. Dokl. **7** (1966), 72–75.
- [17] A.W. ROBERTS, D.E. VARBERG, *Convex Functions*, Academic Press, New York-London, 1973.
- [18] J.-P. VIAL, *Strong and weak convexity of sets and functions*, Math. Oper. Research, **8**, 2 (1983), 231–251.