Mathematical
Inequalities
& Applications
Volume 19, Number 4 (2016), 1287–1293
doi:10.7153/mia-19-94

ON A PROBLEM CONNECTED WITH STRONGLY CONVEX FUNCTIONS

MIROSŁAW ADAMEK

Abstract. In this paper we show that the result obtained by Nikodem and Páles in [3] can by extended to a more general case. In particular, for a non-negative function F defined on a real vector space we define F-strongly convex functions and show that such functions are in the form $g+F^*$, where g is a convex function and F^* is a function associated with function F, iff F^* is a quadratic function. Using this result, we get a characterization of quadratic functions.

Mathematics subject classification (2010): Primary 46C15; Secondary 26B25, 39B62.
Keywords and phrases: Strongly convex function, strongly F-convex function, quadratic function.

REFERENCES

[1] J.-B. HIRIART-URRUTY AND C. LEMARÉCHAL, *Fundamentals of Convex Analysis*, Springer-Verlag, Berlin-Heidelberg, 2001.
[2] P. JORDAN AND J. V. NEUMANN, *On inner products in linear metric spaces*, Ann. Math. **36** (1935), 719–723.
[3] K. NIKODEM, ZS. PÁLES, *Characterizations of inner product spaces by strongly convex functions*, Banach J. Math. Anal. **5** (2011), no. 1, 83–87.
[4] B. T. POLYAK, *Existence theorems and convergence of minimizing sequences in extremum problems with restrictions*, Soviet Math. Dokl. **7** (1966), 72–75.
[5] A. W. ROBERTS AND D. E. VARBERG, *Convex Functions*, Academic Press, New York-London, 1973.
[6] J.-P. VIAL, *Strong convexity of sets and functions*, J. Math. Economics **9** (1982), 187–205.