Journal of Mathematical Analysis and Applications
Volume 479, Issue 1, 1 November 2019, Pages 1364-1382

Characterization of real inner product spaces by Hermite–Hadamard type orthogonalities

Mahdi Dehghani [a], Ali Zamani [b]

[a] Department of Pure Mathematics, Faculty of Mathematical Sciences, University of Kashan, P.O. Box 87317-53153, Kashan, Iran
[b] Department of Mathematics, Farhangian University, Tehran, Iran

Received 29 April 2018, Available online 5 July 2019.

Submitted by R.M. Aron

https://doi.org/10.1016/j.jmaa.2019.07.002

Abstract

In this study, we provide some new characterizations of the real inner product spaces using the notion of Hermite–Hadamard (HH) type orthogonalities and by considering their relationships with Birkhoff–James orthogonality. In addition, we investigate the classes of linear mappings that preserve two special types of these orthogonalities. In particular, we show that every HH-I-orthogonality preserving linear mappings is necessarily a scalar multiple of a linear isometry. Finally, we present some other characterizations of real inner product spaces in terms of HH-P- and HH-I-orthogonality preserving mappings.

Keywords

Birkhoff–James orthogonality; Carlsson orthogonality; Characterization of inner product spaces; Hermite–Hadamard type orthogonality; Orthogonality preserving mapping

Previous Next

Recommended articles Citing articles (0)

View full text