

A New Proof of the Jordan-von Neumann Characterization of the Inner Product Spaces

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Abstract

Among the many characterizations of a real Banach space X to be an inner product space, possibly the most famous one is the Jordan-von Neumann characterization. In this talk, we give a characterization of bounded linear functionals on X , in terms of their Clarke generalized directional derivative, and apply our result to give a new proof of the Jordan-von Neumann characterization of inner product spaces, as well as a characterization of Banach algebra homomorphisms.