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Rectangular modulus, Birkhoff orthogonality and characterizations of inner product spaces

Abstract: Some characterizations of inner product spaces in terms of Birkhoff orthogonality are given. In this connection we define the rectangular modulus μ_x of the normed space X. The values of the rectangular modulus at some noteworthy points are well-known constants of X. Characterizations (involving μ_x) of inner product spaces of dimension ≥ 2, respectively ≥ 3, are given and the behaviour of μ_x is studied.