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ANGLES AND A CLASSIFICATION OF NORMED SPACES

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ABSTRACT. We suggest a concept of generalized angles in arbitrary real normed vector spaces. We give for each real number a definition of an ‘angle’ by means of the shape of the unit ball. They all yield the well known Euclidean angle in the special case of real inner product spaces. With these different angles we achieve a classification of normed spaces, and we obtain a characterization of inner product spaces. Moreover we consider this construction also for a generalization of normed spaces, i.e. for spaces which may have a non-convex unit ball.

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