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## Section:

## 8. Analysis

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**On the Mazur-Ulam Theorem and the Aleksandrov Problem of Conservative Distances**

The theory of isometric mappings had its beginning in the paper by S. Mazur and S. Ulam [Sur les Transformations Isométriques d'Espaces Vectoriels Normés, C. R. Acad. Sci. Paris 194 (1932), 946 - 948] who proved that every isometry of a normed real vector space onto another normed real vector space is a linear mapping up to a translation. A. D. Aleksandrov has posed the problem: Under what conditions is a mapping of a metric space onto itself preserving unit distance an isometry? We shall discuss some new results as well as explain the relevance of isometries in mathematical physics. An extention of the Mazur-Ulam theorem is also obtained.

Reference: D. H. Hyers, G. Isac and Th. M. Rassias, Stability of Functional Equations in Several Variables, Birkhäuser, Boston, Basel, Berlin, 1998.