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Autore	Alsina Claudi
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convexity. 4.2. The dominance relation. 4.3. Uniformly close associative functions. 4.4. Serial iterates and n-copulas. 4.5. Positivity.

Sommario/riassunto

The functional equation of associativity is the topic of Abel's first contribution to Crelle's Journal. Seventy years later, it was featured as the second part of Hilbert's Fifth Problem, and it was solved under successively weaker hypotheses by Brouwer (1909), Cartan (1930) and Aczel (1949). In 1958, B Schweizer and A Sklar showed that the "triangular norms" introduced by Menger in his definition of a probabilistic metric space should be associative; and in their book Probabilistic Metric Spaces, they presented the basic properties of such triangular norms and the closely related copulas. Since then, the study of these two classes of functions has been evolving at an ever-increasing pace and the results have been applied in fields such as statistics, information theory, fuzzy set theory, multi-valued and quantum logic, hydrology, and economics, in particular, risk analysis. This book presents the foundations of the subject of associative functions on real intervals. It brings together results that have been widely scattered in the literature and adds much new material. In the process, virtually all the standard techniques for solving functional equations in one and several variables come into play. Thus, the book can serve as an advanced undergraduate or graduate text on functional equations.