1.	Record Nr.	UNINA9910799219103321
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	Titolo	Exploring Mathematical Analysis, Approximation Theory, and Optimization [[electronic resource]]: 270 Years Since AM. Legendre's Birth / / edited by Nicholas J. Daras, Michael Th. Rassias, Nikolaos B. Zographopoulos
	Pubbl/distr/stampa	Cham : , : Springer International Publishing : , : Imprint : Springer, , 2023
	ISBN	3-031-46487-7
	Edizione	[1st ed. 2023.]
	Descrizione fisica	1 online resource (474 pages)
	Collana	Springer Optimization and Its Applications, , 1931-6836 ; ; 207
	Altri autori (Persone)	RassiasMichael Th ZographopoulosNikolaos B
	Disciplina	515.8
	Soggetti	Functions of real variables Mathematical optimization Approximation theory Functional analysis Operator theory Number theory Real Functions Optimization Approximations and Expansions Functional Analysis Operator Theory Number Theory Anàlisi numèrica Optimització matemàtica Llibres electrònics
	Lingua di pubblicazione	Inglese
	Formato	Materiale a stampa
	Livello bibliografico	Monografia
	Nota di contenuto	Preface On a version of Jensen-Steffensen inequality and a note on inequalities in several variables A class of dynamic unilateral contact problems with sub-differential friction law Square-free values of \$[\textrm{n}^c \tan^\theta(\log \textrm{n})]\$ Ostrowski and

Trapezoid Type Inequalities for Riemann-Liouville Fractional Integrals of Functions with Bounded Variation -- A strong maximum principle for general nonlinear operators -- On the Application of Ergodic Theory to an Alternating Series Expansion for Real Numbers -- Bounds for Similarity Condition Numbers of Unbounded Operators -- Legendre's Geometry and Trigonometry at the Evelpides School (Central Military School) during the Kapodristrian period -- The Overshadowing of Euclid's Geometry by Legendre's Géométrie in the Modern Greek Education -- Finite Element Methods with Higher Order Polynomials --On Local Asymptotics for Orthonormal Polynomials -- New Trends in Geometric Function Theory -- A unified approach to extended general guasi variational inclusions -- On a Reverse Hilbert-Type Inequality in the Whole Plane with Multi-Parameters -- Generating functions for the Fubini type polynomials and their applications -- Kleene Fixed Point Theorems and Applications -- On ergodic states, spontaneous symmetry breaking and guasi-averages -- Improvement of the Hardy inequality and Legendre polynomials. Sommario/riassunto This book compiles research and surveys devoted to the areas of mathematical analysis, approximation theory, and optimization. Being dedicated to A.-M. Legendre's work, contributions to this volume are devoted to those branches of mathematics and its applications that have been influenced, directly or indirectly, by the mathematician. Additional contributions provide a historical background as it relates to Legendre's work and its association to the foundation of Greece's higher education. Topics covered in this book include the investigation of the Jensen-Steffensen inequality, Ostrowski and trapezoid type inequalities, a Hilbert-Type Inequality, Hardy's inequality, dynamic unilateral contact problems, square-free values of a category of integers, a maximum principle for general nonlinear operators, the application of Ergodic Theory to an alternating series expansion for real numbers, bounds for similarity condition numbers of unbounded operators, finite element methods with higher order polynomials, generating functions for the Fubini type polynomials, local asymptotics for orthonormal polynomials, trends in geometric function theory, quasi variational inclusions, Kleene fixed point theorems, ergodic states, spontaneous symmetry breaking and guasi-averages. It is hoped that this book will be of interest to a wide spectrum of readers from several areas of pure and applied sciences, and will be useful to undergraduate students, graduate level students, and researchers who want to be kept up to date on the results and theories in the subjects covered in this volume.