

Functional Equations and Inequalities in Several Variables

Functional Equations In Several Variables

Stefan Czerwik



Functional Equations In Several Variables:

Functional Equations in Several Variables J. Aczél, J. Dhombres, 1989 This treatise deals with modern theory of functional equations in several variables and their applications to mathematics information theory and the natural behavioural and social sciences The authors have chosen to emphasize applications though not at the expense of theory so they have kept the prerequisites to a minimum

Regularity Properties of Functional Equations in Several Variables

Antal Járαι, 2005-03-03 This book illustrates the basic ideas of regularity properties of functional equations by simple examples It then treats most of the modern results about regularity of non composite functional equations of several variables in a unified fashion A long introduction highlights the basic ideas for beginners and several applications are also included

Functional Equations in Several Variables J. Aczel, 1989

Stability of Functional Equations in Several Variables

D.H. Hyers, G. Isac, Themistocles Rassias, 2012-12-06 The notion of stability of functional equations of several variables in the sense used here had its origins more than half a century ago when S Ulam posed the fundamental problem and Donald H Hyers gave the first significant partial solution in 1941 The subject has been revised and developed by an increasing number of mathematicians particularly during the last two decades Three survey articles have been written on the subject by D H Hyers 1983 D H Hyers and Th M Rassias 1992 and most recently by G L Forti 1995 None of these works included proofs of the results which were discussed Furthermore it should be mentioned that wider interest in this subject area has increased substantially over the last years yet the presentation of research has been confined mainly to journal articles The time seems ripe for a comprehensive introduction to this subject which is the purpose of the present work This book is the first to cover the classical results along with current research in the subject An attempt has been made to present the material in an integrated and self contained fashion In addition to the main topic of the stability of certain functional equations some other related problems are discussed including the stability of the convex functional inequality and the stability of minimum points A sad note During the final stages of the manuscript our beloved co author and friend Professor Donald H Hyers passed away

Lectures on Functional Equations and Their Applications

J. Aczel, Hansjorg Oser, 2006-02-01 Numerous detailed proofs highlight this treatment of functional equations Starting with equations that can be solved by simple substitutions the book then moves to equations with several unknown functions and methods of reduction to differential and integral equations Also includes composite equations equations with several unknown functions of several variables vector and matrix equations more 1966 edition

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the authors have included references and explained the results used Moreover the book has been designed so that the chapters can be read almost independently of each other enabling a selection of material to be chosen for introductory and advanced courses At the end of each chapter are included exercises and further results some 400 in all which extend the material presented in the text and also test it The history of functional equations is well documented in a final chapter which is complemented by an encyclopedic bibliography running to over 1600 items

Functional Equations in Several Variables J. Aczél, 1989 This treatise deals with modern theory of functional equations in several variables and their applications to mathematics

Functional Equations And Inequalities In Several Variables Stefan Czerwik, 2002-05-14 This book outlines the modern theory of functional equations and inequalities in several variables It consists of three parts The first is devoted to additive and convex functions defined on linear spaces with semilinear topologies In the second part the problems of stability of functional equations in the sense of Ulam Hyers Rassias and in some function spaces are considered In the last part the functional equations in set valued functions are dealt with for the first time in the mathematical literature The book contains many fresh results concerning those problems

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On Some Functional Equations for Functions of Several Variables Radovan R. Janić, Josip E. Pečarić, 1981

Iterative Functional Equations Marek Kuczma, Bogdan Choczewski, Roman Ger, 1990-07-27 A cohesive and comprehensive account of the modern theory of iterative functional equations Many of the results included have appeared before only in research literature making this an essential volume for all those working in functional equations and in such areas as dynamical systems and chaos to which the theory is closely related The authors introduce the reader to the theory and then explore the most recent developments and general results Fundamental notions such as the existence and uniqueness of solutions to the equations are stressed throughout as are applications of the theory to such areas as branching processes differential equations ergodic theory functional analysis and geometry Other topics covered include systems of linear and nonlinear equations of finite and infinite ORD various function classes conjugate and commutable functions linearization iterative roots of functions and special functional equations

Introduction to Functional Equations Prasanna K. Sahoo, Palaniappan

Kannappan,2011-02-08 Introduction to Functional Equations grew out of a set of class notes from an introductory graduate level course at the University of Louisville This introductory text communicates an elementary exposition of valued functional equations where the unknown functions take on real or complex values In order to make the presentation as manageable as p

On Functions and Functional Equations J. Smital,2020-08-26 On Functions and Functional Equations introduces the main topics in iteration theory and the theory of functional equations with emphasis on applications in the fields of mathematics physics biology chemistry and electronics and mechanical engineering The book contains many classical results as well as important more recent results It also includes numerous exercise and some problems that have yet to be resolved The book is accessible to readers having a secondary level mathematical education *Functional Equations in Applied Sciences* Enrique Castillo,Andres Iglesias,Reyes Ruiz-Cobo,2004-11-04 The book provides the reader with the different types of functional equations that s he can find in practice showing step by step how they can be solved A general methodology for solving functional equations is provided in Chapter 2 The different types of functional equations are described and solved in Chapters 3 to 8 Many examples coming from different fields as geometry science engineering economics probability statistics etc help the reader to change his her mind in order to state problems as functional equations as an alternative to differential equations and to state new problems in terms of functional equations or systems An interesting feature of the book is that it deals with functional networks a powerful generalization of neural networks that allows solving many practical problems The second part of the book Chapters 9 to 13 is devoted to the applications of this important paradigm The book contains many examples and end of chapter exercises that facilitates the understanding of the concepts and applications A general methodology for solving functional equations is provided in Chapter 2 It deals with functional networks a powerful generalization of neural networks Many examples coming from different fields as geometry science engineering economics probability statistics etc illustrate the concept of functional equation Functional equations are presented as a powerful alternative to differential equations The book contains end of chapter exercises **Handbook of Functional Equations** Themistocles M. Rassias,2014-11-21 This handbook consists of seventeen chapters written by eminent scientists from the international mathematical community who present important research works in the field of mathematical analysis and related subjects particularly in the Ulam stability theory of functional equations The book provides an insight into a large domain of research with emphasis to the discussion of several theories methods and problems in approximation theory analytic inequalities functional analysis computational algebra and applications The notion of stability of functional equations has its origins with S M Ulam who posed the fundamental problem for approximate homomorphisms in 1940 and with D H Hyers Th M Rassias who provided the first significant solutions for additive and linear mappings in 1941 and 1978 respectively During the last decade the notion of stability of functional equations has evolved into a very active domain of mathematical research with several applications of interdisciplinary nature The chapters of this handbook focus mainly on

both old and recent developments on the equation of homomorphism for square symmetric groupoids the linear and polynomial functional equations in a single variable the Drygas functional equation on amenable semigroups monomial functional equation the Cauchy Jensen type mappings differential equations and differential operators operational equations and inclusions generalized module left higher derivations selections of set valued mappings D'Alembert's functional equation characterizations of information measures functional equations in restricted domains as well as generalized functional stability and fixed point theory Functional Equations and Modelling in Science and Engineering Enrique

Castillo, 1992-05-27 Provides engineers and applied scientists with some selected results of functional equations and their applications with the intention of changing the way they think about mathematical modelling Many of the proofs are simplified or omitted so as not to bore or confuse engineers Functional equation **Introduction to Functional Equations**

Costas Efthimiou, 2011-10-13 Functions and their properties have been part of the rigorous precollege curriculum for decades And functional equations have been a favorite topic of the leading national and international mathematical competitions Yet the subject has not received equal attention by authors at an introductory level The majority of the books on the topic remain unreachable to the curious and intelligent precollege student The present book is an attempt to eliminate this disparity The book opens with a review chapter on functions which collects the relevant foundational information on functions plus some material potentially new to the reader The next chapter presents a working definition of functional equations and explains the difficulties in trying to systematize the theory With each new chapter the author presents methods for the solution of a particular group of equations Each chapter is complemented with many solved examples the majority of which are taken from mathematical competitions and professional journals The book ends with a chapter of unsolved problems and some other auxiliary material The book is an invaluable resource for precollege and college students who want to deepen their knowledge of functions and their properties for teachers and instructors who wish to enrich their curricula and for any lover of mathematical problem solving techniques In the interest of fostering a greater awareness and appreciation of mathematics and its connections to other disciplines and everyday life MSRI and the AMS are publishing books in the Mathematical Circles Library series as a service to young people their parents and teachers and the mathematics profession **Functional Equations and Inequalities** Themistocles RASSIAS, 2012-12-06 This volume

provides an extensive study of some of the most important topics of current interest in functional equations and inequalities Subjects dealt with include a Pythagorean functional equation a functional definition of trigonometric functions the functional equation of the square root spiral a conditional Cauchy functional equation an iterative functional equation the Hille type functional equation the polynomial like iterative functional equation distribution of zeros and inequalities for zeros of algebraic polynomials a qualitative study of Lobachevsky's complex functional equation functional inequalities in special classes of functions replicativity and function spaces normal distributions some difference equations finite sums

decompositions of functions harmonic functions set valued quasiconvex functions the problems of expressibility in some extensions of free groups Aleksandrov problem and mappings which preserve distances Ulam's problem stability of some functional equation for generalized trigonometric functions Hyers Ulam stability of Hossz's equation superstability of a functional equation and some demand functions in a duopoly market with advertising Audience This book will be of interest to mathematicians and graduate students whose work involves real functions functions of a complex variable functional analysis integral transforms and operational calculus

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