

Indian Journal of Mathematics

Volume 32, No. 1, 1990

CONTENTS

T. N. Sinha

THE DIOPHANTINE EQUATION $-a + x + x^3 + ax^4 = y^2$ 1-4

Abstract: Diophantine equation $-a + x + x^3 + ax^4 = y^2$ with the condition that $1 + 4a^2$ is a prime, is considered in this paper. The main results are that the equation has no integer solutions if $a = \pm 2$ or $\pm 3 \pmod{8}$; and that if $a = 1$, the only integer solutions are given by $x = 2$.

Y. -F. S. Petermann

OMEGA THEOREMS FOR DIVISOR FUNCTIONS 5-14

Abstract: Omega theorems for the functions $G_{b,k}(x)$ ($-1/2 \leq b \leq 1/2$) are obtained for all $k \geq 2$, extending results of Kanemitsu's for $k = 2$, and showing that for these values of b and k the conjectural smallest number $a = \alpha(b)$ for which $G_{b,k}(x) = O(x^{\alpha+\epsilon})$ for every $\epsilon > 0$ ("Chowla-Walum conjecture") is indeed the smallest that can possibly satisfy this property.

Indrajit Lahiri

CERTAIN MODIFIED APPROACH IN INTEGRAL AND MEROMORPHIC FUNCTIONS 15-24

Abstract: Using the concepts of modified Nevanlinna characteristic $T_\alpha(r)$ of a meromorphic $f(z)$ introduced in [4] we prove a theorem on deficient functions after presenting a modified form of the second fundamental theorem. Introducing suitably the idea of modified α -maximum modulus, $M_\alpha(r)$, of integral $f(z)$ we compare the growth properties of $\log M_\alpha(r)$ with $T_\alpha(r)$.

R. G. Buschman

SIMPLE CONTIGUOUS FUNCTION RELATIONS FOR FUNCTIONS DEFINED BY MELLIN-BARNES INTEGRALS 25-32

Abstract: A theorem for contiguous function relations for special functions which are defined by Mellin-Barnes types of integrals is presented. From this theorem a procedure is obtained for writing down those relations which involve a specific subset of the parameters. The integral may be multiple integrals; the actual multiplicity is not an important consideration in the theory. A number of specific examples are included in order to illustrate and to clarify the procedures.

V. Siva Rama Prasad and M. V. S. Bhramarambica

ON THE SCHNIRELMANN DENSITY OF (k, r) -INTEGERS 33-39

Abstract: If $1 < r < k$, an integer of the form $a^k b$, where a is any integer and b is r -free is called a (k, r) -integer. Denoting the set of all positive (k, r) -integers by $Q_{k,r}$, Feng and Subbarao obtained a lower bound for its Schnirelmann density $D(Q_{k,r})$. In this paper we find an improvement of the lower bound for any k and r ; and thereby

find the exact values of $D(Q_{k,3})$ for $k \neq 7$ and $D(Q_{k,4})$ for $k \neq 10, 11$. Adopting our method one can find $D(Q_{k,r})$ with the knowledge of $D(Q_r)$, where Q_r is the set of all r -free integers.

P. K. Saha and B. K. Lahiri

RELATIVE MEASURABILITY IN TOPOLOGICAL GROUPS

41-48

Abstract: The concept of relative measurability of sets and functions and also of relative local measurability of sets have been introduced in the context of a topological group. We prove some basic theorems and establish certain connection between relative measurability of sets, separated sets and points of density of sets.

B. A. Uralegaddi and C. Somanatha

CERTAIN SUBCLASSES OF MEROMORPHIC CONVEX FUNCTIONS

49-57

Abstract: Let $M_n(\alpha)$ denote the class of functions $f(z) = \frac{1}{z} + \sum_{k=1}^{\infty} a_k z^k$ that are regular in the punctured disk $E = \{z : 0 < |z| < 1\}$ and satisfying $\operatorname{Re} \{(n+1)(D^{n+1}f(z))' / (D^n f(z))' - (n+2)\} < -\alpha$, $0 \leq \alpha < 1$, $|z| < 1$, $n \in N_0 = \{0, 1, 2, \dots\}$ where $D^n f(z) = 1 / \{z(1-z)^{n+1}\} * f(z)$ ($*$ is the Hadamard convolution).

(i) For $0 \leq \alpha < 1$; $n \in N_0$, $M_{n+1}(\alpha) \subset M_n(\alpha)$ is proved.

(ii) Let $\sigma_n(\alpha) = M_n(\alpha) \cap \sigma$ where σ denotes the subclass of \sum consisting of functions of the form $f(z) = \frac{1}{z} - \sum_{k=1}^{\infty} |a_k| z^k$. Coefficient inequalities, distortion and closure theorems are obtained for the class $\sigma_n(\alpha)$.

U. C. DE

ON A TYPE OF KÄHLER SPACE WITH CONSERVATIVE CONFORMAL CURVATURE TENSOR

59-67

Abstract: A special conformally conservative Kähler space is flat if its scalar curvature is zero. For non-zero scalar curvature it is Ricci symmetric with parallel curvature tensor, a simple K^* space and the Ricci tensor is of rank 2 with two distinct eigen values. Expressions for Ricci tensor and curvature tensor are given.

Rajni Gupta

FRACTIONAL INTEGRAL OPERATORS AND A GENERAL CLASS OF POLYNOMIALS

69-77

Abstract: In this paper we derive a number of new and useful results for the fractional integral operators involving a general class of polynomials due to Srivastava [5]. Our results are quite general in character and by suitably specializing the coefficients $A_{n,k}$, one can easily obtain a large number of (known or new) results for fractional operators involving classical orthogonal polynomials, Bessel polynomials, and other generalized hyper-geometric polynomials.

N. Faour and S. Yousef

A CLASS OF HANKEL OPERATORS ON BERGMAN SPACES

79-86

Abstract: In this paper a theorem of Beurling's type on Bergman space is proved. Moreover, a class of finite rank Hankel operators on Bergman space is characterized. In particular, it is shown that the Hankel operator S_ϕ , defined on the Bergman space A_2 , with $\phi \in L^\infty$, is of finite rank if and only if ϕu is orthogonal to the space of all complex conjugates of functions f in A_2 , where u is a finite Blaschke product. Also,

it is proved that if S is an operator on A_2 of finite rank such that $ST_z = T_zS$, then $S = S_{\bar{h}}$ with $h = \sum_{i=1}^n \lambda_i k_{\alpha_i, r i-1}$, where $k_{\alpha}(z) = (1 - \bar{\alpha}z)^{-2}$ and $k_{\alpha, r} = \frac{\partial^r}{\partial \alpha^r} k_{\alpha}$.

Sunder Lal and M. S. Rahman

A NOTE ON QUASI-NORMAL SPACES

87-94

Abstract: Some properties of quasi-normal spaces are studied. In particular, a few results on mildly normal spaces by Singal and Singal [12] and Noiri [6] are improved.

S. A. Settu

ON EQUIVALENCE OF SUMMABILITY OF FOURIER SERIES

95-107

Abstract: The families $F(a, q)$, V_{α}^k of summability methods introduced by Meir and Krishnan, are studied in the context of criteria for summability of Fourier and/or Legendre series. Incidentally it is shown that the methods in the latter class are equivalent to each other under a familiar restriction.

H. M. Srivastava

SUM OF A CERTAIN TRIPLE q -HYPERGEOMETRIC SERIES

109-114

Abstract: Making use of a known linear transformation for one of Lauricella's fourteen hypergeometric functions of three variables, K. M. Pradhan derived a closed-form sum of a certain triple hypergeometric series. Motivated by some recent applications of this summation formula, and then proceeds to give its basic (or q -) extension which is believed to be new.
