CONTENTS

Abstract: In this paper we investigate the function $\gamma(n) = \sum_{k=1}^{n}[k,n]$ and its generalizations. We also obtain results on the generalized Euler phi function

$$\phi_f(n,m,a) = \sum_{\substack{1 \le k \le n \\ (k,a)=m}} f(k)$$

Abstract: P. Kesava Menon's elegant identity states that

$$\sum_{\substack{a(mod n) \\ (a,n)=1}} (a-1,n) = \phi(n)\tau(n)$$

where $\phi(n)$ is Euler's totient function and $\tau(n)$ is the number divisors of n. This identity has been generalized in various directions in the literature. In this note we give analogs of this identity arising from the concept of a k-dimentional $r-th$ degree reduced residue system modulo n.

Abstract: A known theorem states that if $B \subset X$ is a bounded set and if T is a linear relation between X and Y. where X and Y are normed spaces, then T is Tauberian if TB relatively weakly compact implies that B is relatively weakly compact. In this paper various applications of this results are shown under the setting of linear relations. In addition some characterizations of Tauberian relations are derived.

Abstract: A result analogous to that of Birkhoff's theorem of general relativity

has been established to exist for electromagnetic fields in a self-creation theory of gravitation proposed by Barber, when the scaler fields introduced in the theory is independant of time. Some important investigation are made in this connection and it seems that continuous creation of matter in such a case is considerably slow. New vistas towards the evolution of our Universe is expected from such a study.

Sanjai Rai and C. C. A. Sastri

ON THE SIMPLIFICATION OF OVSIANNIKOV'S METHOD FOR THE CONSTRUCTION OF PARTIALLY INVARIANT SOLUTIONS   65-74

Abstract: The Simplification of Ovsiannikov's method for the construction of partially invariant solutions (PIS) of a system of partial differential equations (pde^s) carried out earlier by Sastri. Dunn and Rao (1987) in the case of one dimensional heat equation $u_1 = u_{xx}$ is extended here to systems of nonlinear pde^s. Although a procedure that work for all system of pde* is not given here, the example considered, namely the equations of the transonic flow of a gas, the Landau damping equation and the Burgers equation provide a basis for handling nonlinear equation in general. Invariant and partially invariant solution are constructed for t wo different forms of the Burgers equation. Both type of solotions exhibit the blow up property. The PIS however , turns out to be reducible, i.e., invariant w.r.t. a subgroup of the symmetry group. The problems of finding irreducible PIS for some form of the generalized Burgers equation will be adressed in a future publication.

G. Criscuolo and L. Scuderi

CONVERGENCE OF PRODUCT QUADRATURE RULES WITH PREASSIGNED NODES   75-90

Abstract: Product quadrature rule, with preassigned and simple nodes. to compute ordinary integrals, is investigated. Nodes are located within the interval of integration. The convergence of the proposed formula is proved and an estimate in L_1-weighted norm is established.

Ming Po Chen And Sehie Park

ON THE BROWDER TYPE BEST APPROXIMATION THEOREMS   91-97

Abstract: Best approximation theorems extending Browder's sharpened form of the Schauder fixed point theoram are obtained. Our new results extend and unify many known theorems.

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