Indian Journal of Mathematics
Volume 44, No. 3, 2002

CONTENTS

Abstract: In this paper we derive some $P-Q$ eta-function identities of Ramanujan on employing theta-function identities. As an application of these $P-Q$ identities, we compute some new interesting values for Ramanujan-Weber class invariants and Ramanujan's cubic continued fraction.

Abstract: Snider showed that the class of radicals of rings has a natural lattice structure. The same is true for any universal class of near-rings. Lattices of radicals of near-rings have been studied by the present author, together with Birkenmeier and Groenewald. In this paper we study the lattice of overnilpotent radicals L_Z^0 of zero-symmetric near-rings. Relationships are established with the lattice L_R^{su} of supernilpotent radicals of rings. We give a partial characterization of the atoms of L_Z^0, similar to that obtained by France-Jackson for L_R^{su}. Finally some of these results are extended to overnilpotent radicals of arbitrary near rings.

Abstract: In this paper, we generate some topologies closely related to the density topology in a topological group.

Abstract: Let $(\Omega, \sum)$ be a measurable space, N be a bounded family of positive measures and X be an arbitrary Banach space. We present some characterizations of weakly compact subsets in the Lebesgue-type spaces $L_1(N, X)$

Abstract: We intend to study the continuous and compact imbeddings of weighted Sobolev spaces with power type weights for certain different kinds of domains. These imbeddings are also extended for higher dimensional Sobolev spaces.

Abstract: Fourier transform technique has been employed to study the stretch and microrotation effects of a load applied normal to the boundary and moving at a constant velocity along one of the coordinate axes in a microstretch generalized thermoelastic half-space. The analytical expressions of displacement component, force stress, couple stress, microstress and temperature field have been obtained for two different theories i.e, Lord Shulman $(L - S)$ and Green-Lindsay $(G - L)$ for supersonic, subsonic and transonic velocities in case of mechanical and thermal sources applied. The integral transforms have

been inverted by using a numerical technique. The various expression so obtained in the physical domain have been computed numerically and illustrated graphically for magnesium crystal like material.

Jinjin L_1 And Shouli Jiang

PROPERTIES OF SOME SPECIAL COVERS* 345-351

Abstract: The relations among k-covers, cs^*- covers and k-systems have been discussed and one problem posed by Tanaka has been partially answered. Amongst its applications a characterization of the sequence-covering s-image of a locally separable metric space is given.

R. M. Patel and G. M. Deheri

ON THE BEHAVIOR OF SQUEEZE FILM FORMED BY MAGNETIC FLUID BETWEEN CURVED ANNULAR PLATES 253-359

Abstract: The investigation deals with the behavior of the squeeze film formed by magnetic fluid between curved annular plates considering the curvature of a hyperbolic form to represent the film thickness. The concerned Reynold's equation is solved and the expressions for pressure, load carrying capacity and response time are derived. The results are computed and presented in tabular form. However, for the sake of comparison the results are presented graphically for conventional lubricant. It is seen that those performance characteristics increase sharply with increasing magnetization parameter.The performance of the bearing with magnetic fluid lubricant is observed to be considerably better than that with the conventional lubricant. Further this article drives home the fact that even the performance of the bearing in the present case is relatively superior to that of the configuration wherein the film thickness has been represented by considering the curvature of a hyperbolic form.

Abstract: In this paper we establish the following theorem:

Let $\varphi(x_1, x_2, \ldots, x_k)$ be a continuous real function on $\mathbf{R^k}$ where
(a) $\varphi(x, x, \ldots, x) \leq x$ for every $x \in \mathbf{R}$;
(b) $\varphi \in C(\mathbf{R^k}, \mathbf{R})$ is nondecreasing in each of its arguements;
(c) $\varphi(x_1, x_2 \ldots, x_k)$ is strictly increasing in at least two of its arguements x_i and x_j, where i and j are relatively prime.

If (a_n) is a sequence which satisfies the inequality

$$a_{n+k} \leq \varphi(a_{n+k-1}, a_{n+k-2}, \ldots, a_n) \text{ for } n \in N \cup \{0\}.$$

then it coverges or tends to minus infinity.

Abstract: Delay difference equations with forcing term and the related difference equations are studied and sufficient conditions are derived for all solutions to be oscillatory.

****