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CONTENTS

Abstract: A computational method to solve linear as well as quasi-linear singularly perturbed two point boundary value problems having a boundary layer at one end point is presented. A fitted factor is introduced in the tridiagonal system by using the asymptotic solution of the problem. The system is solved by using the well-known Thomas algorithm. The stability and uniform convergence analysis of the method is also presented. To demonstrate the applicability of the method several examples have been considered. The maximum absolute errors for the problems without fitting factor and with fitting factor are compared in the tables. From the results it is clear that the presented method has a good approximation to the exact solution.

Abstract: In this paper we present multiplicity type results for a general class of maps.

Abstract: The authors study the discrete fourth order periodic boundary value problem

$$\begin{cases} (Lu)(t) = \lambda f(t, u(t)) + \mu g(t, u(t)), \quad t \in [1, N]_{\mathbb{Z}}, \\ \Delta^i u(-1) = \Delta^i u(N-1), \quad i = 0, 1, 2, 3, \end{cases}$$

where

$$(Lu)(t) = \Delta^4 u(t-2) - \Delta\big(p(t-1)\Delta u(t-1)\big) + q(t)u(t).$$

By using variational methods and critical point theory, they obtain some criteria for the existence of infinitely many solutions. Several consequences of the main theorems are also presented. One example is included to illustrate the applicability of the results.

Abstract: The object of the present paper is to prove that in an anti-Kähler manifold of dimension n, $divR = 0$ and $divC = 0$ are equivalent, where 'div' denotes divergence, R and C denote the curvature tensor and Weyl curvature tensor, respectively. Besides this, we also discuss about Einstein anti-Kähler manifolds.

Abstract: In the present paper, we show that under contractive conditions, the notion of subcompatible maps reduces to weakly compatible maps. Thus weakly compatible maps remains a minimal commutativity condition for the existence of unique common fixed of contractive type maps. Some illustrative examples have also been furnished in the support of our result.

Abstract: The paper is concerned with the study of magnetohydrodynamic free convection heat and mass transfer flow of an incompressible electrically conducting micropolar fluid with heat generation/absorption over a permeable stretching sheet in the presence of uniform magnetic field and a first order chemical reaction. The governing equations for this investigation are formulated and solved numerically using MATHEMATICA 7.0. The effects of various physical parameters on the flow, microrotation, species concentration and heat transfer characteristics as well as the skin friction coefficient, Nusselt number and Sherwood number are illustrated through graphs and tables. The physical aspects of the problem are also highlighted and discussed.

Talal Ali Al-Hawary

FUZZY FLATS 223-236

Abstract: In 1988, R. Goetschel and W. Voxman [2] introduced the concept of fuzzy matroids. Subsequently, several scholars researched fuzzy matroid notions. In this paper, we introduce the notion of fuzzy flats and provide several examples. Thus fuzzy matroids are defined via fuzzy flats axioms. We show that the levels of the fuzzy matroid introduced are indeed crisp (classical) matroids. Moreover, fuzzy strong maps and fuzzy hesitant maps are introduced and explored.

Yunyun Yang and Ricardo Estrada

EXTENSION OF FRAHM FORMULAS FOR $\partial_i\partial_j\,(1/r)$ 237-245

Abstract: We prove the formula

$$\frac{\partial^{*2}(r^{-1})}{\partial x_i \partial x_j} = \left(3x_i x_j - \delta_{ij} r^2\right) \mathcal{P}f\left(r^{-5}\right) + 4\pi\left(\delta_{ij} - 4n_i n_j\right)\delta_*,$$

for the second order thick derivatives of r^{-1} in $\mathbb{R}^3$, where δ_* is a thick delta of order 0. This formula generalizes the well known Frahm formula for the distributional derivatives of r^{-1}, and provides an alternative to the extended formula given by J. Franklin in "Comment on 'Some novel delta-function identities' by Charles P Frahm (Am. J. Phys. **51** 826–9 (1983))," Am. J. Phys. **78** 1225–26 (2010).

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