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Research Article

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## Coincidence and common fixed points for F-Contractive mappings

Published On: December 28, 2023 | Pages: 196 - 212

Author(s): Muhammed Raji\* and Musa Adeku Ibrahim

The purpose of this article is to establish the existence and uniqueness of coincidence and common fixed point of discontinuous non-compatible faintly compatible pair of self maps in non-complete metric space without using containment requirement of range space of involved maps satisfying Ciric type F-contraction and Hardy-Roger type F-contraction. Some illustrative e ...

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## Successive differentiation of some mathematical functions using hypergeometric mechanism

Published On: December 08, 2023 | Pages: 182 - 186

Author(s): MI Qureshi, Tafaz ul Rahman Shah\* and Shakir Hussain Malik

In this article, we obtain successive differentiation of some composite mathematical functions: ...

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## Study of the effect of multiple phase transformations and relaxation annealing on the microstructure of a martensitic TiNi alloy in different structural states

Published On: November 09, 2023 | Pages: 173 - 179

Author(s): Anna Churakova\* and Elmira Iskhakova

The work was devoted to studying the effect of multiple phase transformations in the temperature range of phase

transformations of a TiNi alloy with a martensitic structure in various initial states - coarse-grained, ultrafine-grained, nanostructured. The conducted studies have shown that in the process of thermal cycling, the accumulation of defects in the crystallin ...

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## All physical information is discretely connected from the beginning and all geometrical appearance is a delayed statistical consequence

Published On: November 09, 2023 | Pages: 159 - 172

Author(s): Wolfgang Orthuber \*

Information is physically measurable as a selection from a set of possibilities, the domain of information. This defines the term "information". The domain of the information must be known together reproducibly beforehand. As a practical consequence, digital information exchange can be made globally efficient, interoperable, and searchable to a large extent by online ...

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## Unique factorization theorem for pure quantum states

Published On: September 15, 2023 | Pages: 149 - 153

Author(s): Dhananjay P Mehendale\*

In this paper we establish a unique factorization theorem for pure quantum states expressed in computational basis. We show that there always exists unique factorization for any given N-qubit pure quantum state in terms of the tensor product of non-factorable or "prime" pure quantum states. This result is based on a simple criterion: Given N-qubit pure quantum state ...

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## Open path theory: Pattern and structure in prime numbers

Published On: August 25, 2023 | Pages: 141 - 148

Author(s): Diego Real\*

The Open Path theory, supported by experimental data, is presented. The main hypothesis proposes that Prime Numbers's positions are determined by previous Prime Numbers as well as their spacing, in a complex, but deterministic way. The concepts of Open Path, Perfect Space, and Primorial Perfect Space are introduced. The Open Path theory can predict prime gaps of any m ...

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## The behavior of population dispersion employing various numerical techniques

Published On: August 18, 2023 | Pages: 126 - 140

Author(s): Imran Abbas\* and Asad Ejaz

The exploration of population diversity motivated us to present this paper. A mathematical model for the ecological process of population dispersion is finally considered by us to figure out the dispersion of population along the area. The dispersal from one's home site to the next is considered the most important phenomenon in the demographic and evolutionary dynamic ...

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## The speed of the body at the moment of transition to a massless state is a new world constant

Published On: August 04, 2023 | Pages: 114 - 118

Author(s): BG Golovkin\*

Based on the kinetic theory of gases, the minimum temperature and critical velocity of a body necessary for its transition to a massless state are estimated. The value of this speed = 235696.8871 kms is a new world constant, since it is the same for a body, regardless of its size, mass, density, and chemical composition. For the first time, the masses of X, and Y - ...

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## Some fixed point results in rectangular metric spaces

Published On: July 19, 2023 | Pages: 108 - 113

Author(s): Sarita Devi and Pankaj\*

After motivation from Geraghty-type contractions and of Farhan, et al. we define  $\phi$ -admissible mappings and demonstrate the fixed point theorems for the above-mentioned contractions in rectangular metric space in this study. In the end, we discuss some consequences of our results as corollaries. 2010 MSC: 47H10, 54H25. ...

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## Covariance edges matrix of geometric elements

Published On: July 01, 2023 | Pages: 100 - 107

Author(s): Florian Blachere and Houman Borouchaki\*

In this paper, we introduce a new matrix associated with polygons and polyhedrons, namely the covariance edges matrix. We show that, for a regular polygon or polyhedron the corresponding matrix is proportional to the identity of size two or three. Based on this fact, we propose, as an application, several algebraic shape quality measures for convex polygons or polyhed ...

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### Review Article

## Numerical simulations in a generalized Liénard's type system

Published On: December 26, 2023 | Pages: 187 - 195

Author(s): Juan E Nápoles Valdés\* and Paula Macarena Roa\*

In this note we present some numerical simulations of the asymptotic behavior of a Generalized Liénard Equation, taking into account a recently defined differential operator. We must point out that these numerical variations have not been obtained as usual: by varying the functions of the right member of the system considered, but, on the contrary, by varying the kern ...

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## Short Communication

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### Calculation of the influence of the entropy of stars on the Earth's exosphere and the theory of entropic gravity

Published On: December 05, 2023 | Pages: 178 - 181

Author(s): Violeta N Nikoli\*

In the first part of this study, the entropic contribution of star objects, observable during the night between November 13 and 14, 2021, in the sky above Belgrade (Lat. 44o 49' 04" N, Long. 20o 27' 25" E, mean Elev. 117 m), Serbia, to the thermodynamic equilibrium of the Earth's exosphere, was determined. In the second part of the study, the force of gravitational ...

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### Sequential method conformal mappings

Published On: October 04, 2023 | Pages: 154 - 155

Author(s): Soninbayar Jambaa\*

The well-known, very important Schwarz–Christoffel integral does not yet completely solve the problem of mapping a half-plane onto a predetermined polygon. This integral includes parameters (inverse images of the polygon), the relationship of which with the lengths of the edges of the polygon is not known in advance. The main difficulty in using the Schwarz–Christoffe ...

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## Mini Review

## Revisiting the holstein-primakov transformations

Published On: October 31, 2023 | Pages: 156 - 159

Author(s): SO Gladkov\*

It is shown that in addition to the Holstein-Primakov transformations in the theory of magnetism, a number of other transformations can be proposed which also lead to very interesting and consistent results. In particular, with the help of the transformation proposed in the paper for spin operators, it turns out to be possible to strictly analytically calculate the te ...

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## A substance with negative mass

Published On: August 16, 2023 | Pages: 119 - 125

Author(s): BG Golovkin\*

The conditions for the formation of a substance with a negative mass are investigated. The critical velocity of a body = 235696.8871 km/s, necessary for its transition to a massless state, was determined by two independent methods. Zeroing of the mass of matter also occurs at a temperature  $T = 2.17 \cdot 10^{36} m_0$  ( $m_0$  is the rest mass of the particle in grams). At higher ...

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