

ISSN 1015-8634(Print)  
ISSN 2234-3016(Online)

# 대한수학회보

# Bulletin of the Korean Mathematical Society

VOLUME 51  
NUMBER 3  
May 2014

kms  대한수학회  
Korean Mathematical Society

BULLETIN OF THE KOREAN MATHEMATICAL SOCIETY

VOL. 51, NO. 3

May 2014

ISSN 1015-8634 (Print)  
ISSN 2234-3016 (Online)

**BULLETIN OF THE KOREAN MATHEMATICAL SOCIETY**  
**大韓數學會報**

Since its inception in 1964, this journal endeavors to publish significant research developments of broad interests in pure and applied mathematics. One volume is published each year, and each volume consists of six issues (January, March, May, July, September, November).

**Editorial Policy**

To be published in the *Bulletin*, a paper must be correct, new, nontrivial, and significant.

**Submission of Manuscripts**

See **Information for Authors** at the end of this issue.

**Copyright**

A Copyright Transfer Agreement is required before the publication of a paper in this journal. The submission of a paper implies the author's assurance that it has not been copyrighted, published, nor submitted for publication elsewhere.

**Subscriptions**

The subscription price is US\$80 per year to individuals and US\$140 per year to institutions. Members of the KMS receive exclusive discount on annual subscriptions to KMS journals. Correspondences regarding subscriptions, membership, and notices of change of address should be sent to:

Korean Mathematical Society, The Korea Science and Technology Center 202,  
22, 7Gil, Teheran-ro, Gangnam-gu, Seoul 135-703, Korea  
E-mail: kms@kms.or.kr

**Reciprocal Membership Agreements**

The KMS has reciprocal membership agreements with the American Mathematical Society, the Indian Mathematical Society, the Mathematical Society of Japan, the Royal Spanish Mathematical Society and Société Mathématique France. Any member of these societies may join the KMS at half of the current rate.

**Publications of the Society**

The KMS publishes three research periodicals, the Journal, the Bulletin, and the Communications. The Journal and Bulletin are published bimonthly and the Communications is published quarterly.

**Indexing and Abstracting Services**

Articles published in this journal are indexed or abstracted in ISI Alerting Services®, Mathematical Reviews, Science Citation Index-Expanded® and Zentralblatt für Mathematik.

© Korean Mathematical Society, 2014

Published by the Korean Mathematical Society

Printed in Korea, May 2014

This journal was supported by the Korean Federation of Science and Technology Societies Grant funded by the Korean Government.

*Continued from back cover*

Ground state solutions of non-resonant cooperative elliptic systems with superlinear terms <b>Guanwei Chen</b> . . . . .	789
Harmonic mappings related to functions with bounded boundary rotation and norm of the pre-Schwarzian derivative <b>Stanisława Kanas and Dominika Klimek-Smęł</b> . . . . .	803
Quasipolar matrix rings over local rings <b>Jian Cui and Xiaobin Yin</b> . . . . .	813
Some classifications of ruled submanifolds <b>Dong-Soo Kim, Young Ho Kim, and Sun Mi Jung</b> . . . . .	823
A further investigation of generating functions related to pairs of inverse functions with applications to generalized degenerate Bernoulli polynomials <b>Sebastien Gaboury and Richard Tremblay</b> . . . . .	831
Finite element approximations of the optimal control problems for stochastic Stokes equations <b>Youngmi Choi, Soohyun Kim, and Hyung-Chun Lee</b> . . . . .	847
Some warped product submanifolds of a Kenmotsu manifold <b>Viqar Azam Khan and Mohammad Shuaib</b> . . . . .	863
<i>GCR</i> -lightlike submanifolds of a semi-Riemannian product manifold <b>Sangeet Kumar, Rakesh Kumar, and Rakesh Kumar Nagaich</b> . . . . .	883
Area of triangles associated with a curve <b>Dong-Soo Kim and Kyu-Chul Shim</b> . . . . .	901
Meridian surfaces in $\mathbb{E}^4$ with pointwise 1-type Gauss map <b>Kadri Arslan, Betül Bulca, and Velichka Milousheva</b> . . . . .	911

CONTENTS

When an  $\mathcal{S}$ -closed submodule is a direct summand  
**Yongduo Wang and Dejun Wu** ..... 613

Solutions of systems of variational inequalities on fixed points of  
 nonexpansive mappings  
**Hossein Piri** ..... 621

Convex solutions of the polynomial-like iterative equation on open set  
**Xiaobing Gong** ..... 641

Results of certain local cohomology modules  
**Amir Mafi and Atiyeh Pour Eshmanan Talemi** ..... 653

$T$ -neighborhoods in various classes of analytic functions  
**Saeid Shams, Ali Ebadian, Mahta Sayadiazar, and  
 Janusz Sokół** ..... 659

On  $\mathcal{I}$ -scattered spaces  
**Zhaowen Li and Shizhan Lu** ..... 667

General decay for a semilinear wave equation with boundary frictional  
 and memory conditions  
**Sun Hye Park** ..... 681

Normal family of meromorphic functions  
**Jian-Ping Wang** ..... 691

Kruskal-Wallis one-way analysis of variance based on linear placements  
**Yicheng Hong and Sungchul Lee** ..... 701

Quadrature based finite element methods for linear parabolic interface  
 problems  
**Bhupen Deka and Ram Charan Deka** ..... 717

On the nonlinear matrix equation  $X + \sum_{i=1}^m A_i^* X^{-q} A_i = Q (0 < q \leq 1)$   
**Xiaoyan Yin, Ruiping Wen, and Liang Fang** ..... 739

Group inverse and generalized Drazin inverse of block matrices in a  
 Banach algebra  
**Dijana Mosić** ..... 765

Approximation methods for a common minimum-norm point of a solution  
 of variational inequality and fixed point problems in Banach spaces  
**N. Shahzad and H. Zegeye** ..... 773