

ISSN 0030-1566

MATHEMATICAL JOURNAL  
OF  
OKAYAMA UNIVERSITY

---

VOL. 54 2012

PUBLISHED BY

DEPARTMENT OF MATHEMATICS  
FACULTY OF SCIENCE  
OKAYAMA UNIVERSITY  
OKAYAMA, JAPAN

# MATHEMATICAL JOURNAL OF OKAYAMA UNIVERSITY

FOUNDED BY M. MORIYA, T. INAGAKI, M. OSIMA, T. OTSUKI

*EDITED BY*

Masao HIROKAWA

Kazuyoshi KIYOHARA

Kazuhisa SHIMAKAWA

Hiro-Fumi YAMADA

Tomoyuki KAKEHI

Hiroaki NAKAMURA\*

Hideo TAMURA

Yuji YOSHINO

(\* : Managing Editor)

Each volume consists of two numbers, and each number which contains about 100 pages will appear semi-annually.

According to circumstances, there are some cases where one volume containing about 200 pages appears annually.

All communications relating to this publication should be addressed to

Mathematical Journal of Okayama University

Department of Mathematics

Faculty of Science

Okayama University

Okayama 700-8530, Japan

---

E-mail: [journal@math.okayama-u.ac.jp](mailto:journal@math.okayama-u.ac.jp)

Information for authors is to be found on the inside back cover.

Visit our web site

<http://www.math.okayama-u.ac.jp/mjou/>

Copyright©2012 by the Editorial Board of Mathematical Journal of Okayama University

## Information for authors

### Submission of Manuscripts

- (1) Articles on pure and applied mathematics intended for publication in *Mathematical Journal of Okayama University* should be written in English.
- (2) Only original papers not yet published and not simultaneously submitted for publication elsewhere will be accepted.
- (3) Electronically prepared manuscripts in printable files (dvi or pdf) can be sent via e-mail to:

`journal@math.okayama-u.ac.jp`

- (4) Electronic submission in LaTeX style is preferred. If you are unable to submit your manuscript electronically, you should send two hard copies to the Editorial Office of Mathematical Journal of Okayama University, Department of Mathematics, Okayama University, Okayama 700-8530, Japan.
- (5) After acceptance for publication, authors will be requested to send a LaTeX file coded with the style file “jokayama.cls” which (together with all necessary additional information on how to use the style sheet) is available at our homepage:

<http://www.math.okayama-u.ac.jp/mjou/>.

### Proofs

Authors will receive page proofs, preferably by e-mail in PDF format. Corrections should be confined to typographical errors. Authors will be charged for excessive corrections. Please correct your galley proofs and return them within 14 days together with the signed copyright agreement.

### Reprints

The corresponding author will receive 50 hardcopy reprints free of charge, this number to be shared between joint authors.

---

#### **Edit and Publishing:**

Department of Mathematics,  
Faculty of Science, Okayama University  
Okayama, JAPAN

#### **Design and Printing Office:**

... Co. Ltd.

## CONTENTS

---

	Page
HAZI, M. AND BRAGDI, M. Controllability of Fractional Integrodifferential Systems via Semigroup Theory in Banach Spaces .....	133
ICHIMURA, H. Hilbert-Speiser number fields and Stickelberger ideals; the case $p = 2$ .....	33
MOON, H. On the structure of the Mordell-Weil groups of the Jacobians of curves defined by $y^n = f(x)$ .....	49
MOUSSA, A.-A. AND ZLAÏJI, L. Homogenization of non-linear variational problems with thin inclusions .....	97
QI, Y. The tangent bundles over equivariant real projective spaces .....	87
SATO, R. On means of Banach-space-valued functions .....	145
SUWA, N. Some remarks on Lucas pseudoprimes .....	1
TAKEHANA, Y. On a generalization of QF-3' modules and hereditary torsion theories .....	53
TAKEHANA, Y. On a generalization of CQF-3' modules and cohereditary torsion theories .....	65
YAMAGUCHI, K. Note on the homotopy of the space of maps between real projective spaces .....	77

**JANUARY 2012**

**Vol. 54**

**CONTENTS**

---

	Page
SUWA, N. Some remarks on Lucas pseudoprimes .....	1
ICHIMURA, H. Hilbert-Speiser number fields and Stickelberger ideals; the case $p = 2$ .....	33
MOON, H. On the structure of the Mordell-Weil groups of the Jacobians of curves defined by $y^n = f(x)$ .....	49
TAKEHANA, Y. On a generalization of QF-3' modules and hereditary torsion theories .....	53
TAKEHANA, Y. On a generalization of CQF-3' modules and cohereditary torsion theories .....	65
YAMAGUCHI, K. Note on the homotopy of the space of maps between real projective spaces .....	77
QI, Y. The tangent bundles over equivariant real projective spaces .....	87
MOUSSA, A.-A. AND ZLAÏJI, L. Homogenization of non-linear variational problems with thin inclusions .....	97
HAZI, M. AND BRAGDI, M. Controllability of Fractional Integrodifferential Systems via Semigroup Theory in Banach Spaces .....	133
SATO, R. On means of Banach-space-valued functions .....	145

# SOME REMARKS ON LUCAS PSEUDOPRIMES

NORIYUKI SUWA

Reprinted from MATHEMATICAL JOURNAL OF OKAYAMA UNIVERSITY  
Vol. 54, 2012

**HILBERT-SPEISER NUMBER FIELDS AND  
STICKELBERGER IDEALS; THE CASE  $p = 2$**

HUMIO ICHIMURA

Reprinted from MATHEMATICAL JOURNAL OF OKAYAMA UNIVERSITY  
Vol. 54, 2012

**ON THE STRUCTURE OF THE MORDELL-WEIL GROUPS  
OF THE JACOBIANS OF CURVES DEFINED BY  $y^n = f(x)$**

HYUNSUK MOON

Reprinted from MATHEMATICAL JOURNAL OF OKAYAMA UNIVERSITY  
Vol. 54, 2012



**ON A GENERALIZATION OF QF-3' MODULES AND  
HEREDITARY TORSION THEORIES**

YASUHIKO TAKEHANA

Reprinted from MATHEMATICAL JOURNAL OF OKAYAMA UNIVERSITY  
Vol. 54, 2012

**ON A GENERALIZATION OF CQF-3' MODULES AND  
COHEREDITARY TORSION THEORIES**

YASUHIKO TAKEHANA

Reprinted from MATHEMATICAL JOURNAL OF OKAYAMA UNIVERSITY  
Vol. 54, 2012

**NOTE ON THE HOMOTOPY OF THE SPACE OF MAPS  
BETWEEN REAL PROJECTIVE SPACES**

KOHHEI YAMAGUCHI

Reprinted from MATHEMATICAL JOURNAL OF OKAYAMA UNIVERSITY  
Vol. 54, 2012

**THE TANGENT BUNDLES  
OVER EQUIVARIANT REAL PROJECTIVE SPACES**

YAN QI

Reprinted from MATHEMATICAL JOURNAL OF OKAYAMA UNIVERSITY  
Vol. 54, 2012

**HOMOGENIZATION OF NON-LINEAR VARIATIONAL  
PROBLEMS WITH THIN INCLUSIONS**

ABDELAZIZ AÏT MOUSSA AND LOUBNA ZLAÏJI

Reprinted from MATHEMATICAL JOURNAL OF OKAYAMA UNIVERSITY  
Vol. 54, 2012

**CONTROLLABILITY OF FRACTIONAL  
INTEGRODIFFERENTIAL SYSTEMS  
VIA SEMIGROUP THEORY IN BANACH SPACES**

MOHAMMED HAZI AND MABROUK BRAGDI

Reprinted from MATHEMATICAL JOURNAL OF OKAYAMA UNIVERSITY  
Vol. 54, 2012

**ON MEANS OF BANACH-SPACE-VALUED FUNCTIONS**

RYOTARO SATO

Reprinted from MATHEMATICAL JOURNAL OF OKAYAMA UNIVERSITY  
Vol. 54, 2012