ABSTRACTS

of Papers Presented to the
American Mathematical Society

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Abstracts for

AMS

by rotating one circle about another circle in the same plane, with a shared center, but distinct radii.   (Received September 22, 2009)

1056-Z1-1574   **Fabiana Cardetti*** (fabiana.cardetti@uconn.edu), 196 auditorium Rd, Unit 3009, Storrs, CT 06268, and **P. Joseph McKenna**. *Getting pumped for math: An investigation of student motivations.*

There is a substantial body of research on student motivations and academic achievement at the elementary and high school level, but less is known at the college level. By understanding what motivates students to learn mathematics, instructors can adapt their teaching to help students achieve a level of engagement conducive to mathematics learning. This study examined college students' perceptions of what motivates them to learn mathematics. Our findings were based on the analysis of the students' journal writings about this topic. The analysis revealed six main motivation themes. We will present and discuss these findings, as well as offer recommendations for instructional practices that promote the different motivations described by the students. Areas for further research will also be presented.   (Received September 22, 2009)

1056-Z1-1597   **Nicholas Hamblet*** (nick.hamblet@gmail.com), 1039 Preston Ave Apt #4, Charlottesville, VA 22903. *The Orthogonal Tower for $\Sigma^\infty \, \text{Emb}(\coprod_m D^n, V)$.* Preliminary report.

Given a manifold M, we wish to study the (suspension spectrum of the) space of embeddings of M into a vector space V, as a functor of V. In this talk, we will discuss the case when M is a disjoint union of copies of the standard open ball D^n in $\mathbb{R}^n$, and consider the space of affine embeddings. We provide a natural homotopy limit model for $\Sigma^\infty \, \text{Emb}(\coprod_m D^n, V)$ and show how to use it to obtain the Orthogonal Tower for this functor. This tower provides best polynomial approximations, in the sense of Weiss, to the embedding functor.   (Received September 22, 2009)

1056-Z1-1601   **Tom McMillan** (tcmcmillan@ualr.edu), Department of Mathematics & Statistics, UALR, 2801 South University Ave, Little Rock, AR 72204-1099, and **Jim Fulmer*** (jrfulmer@ualr.edu), Dept. of Mathematics & Statistics, UALR, 2801 South University Ave, Little Rock, AR 72204-1099. *Using Proofs without Words to Explore Rules of Differentiation.*

This talk will describe our experience using geometric proofs without words for the rules of differentiation as a means for getting students to think about the differentiation rules and for coming up with proofs in their own words. We distributed to our students a variety of picture proofs and let them work with partners in developing a written proof that explained the picture proof. Our talk will describe the insights and innovations that students came up with as they used the pictures as a guide for proving the differentiation formulas. This was a required activity of the course, and students presented their results as part of the course portfolio. We felt that this experience helped students develop the confidence to create their own proofs.   (Received September 22, 2009)

1056-Z1-1605   **Larry Wayne Lewis*** (llewis@spalding.edu), Spalding University, 845 South Third Street, Louisville, KY 40203. *An Action Research Proposal: Does the Ability to Purchase a Week's Worth of Groceries for under One Dollar Influence the Chance that a Student will make an "Innumeracy Type" Statistical Error?* Preliminary report.

Many students in certain quantitative research courses are unable to compare, with surety, the magnitude of decimal numbers as evidenced by their hesitance or inability to quickly and correctly identify whether or not a p-value is less than a given significance level, thereby producing an otherwise obvious "Innumeracy Type" error. Such an error is prompted by student innumeracy that involves making a correct or incorrect null hypothesis rejection (or non-rejection) decision by comparing a correct p-value to the fixed significance level incorrectly. The probability of an "Innumeracy Type" error is perhaps conditioned upon the student's mathematical background and level of acceptance of the prevalent incorrect societal usage of decimal expressions. In an attempt to call attention to a common improper use of the decimal point in the familiar context of American commerce and currency and its potential influence on students, the author proposes a primarily qualitative action research study that will lead to a possible intervention and a future action plan that might improve the andragogical methodology for the teaching and learning of computationally underprepared graduate students enrolled in certain applied quantitative statistical research courses.   (Received September 22, 2009)

1056-Z1-1612   **Michael P Saclolo*** (mikeps@stedwards.edu), 3001 South Congress Avenue, Austin, TX 78704. *Calculus Laboratory: A Companion Course to the Lecture.* Preliminary report.

The first semester calculus course at St. Edward's University has a companion laboratory course. This one-credit workshop-style course serves to further and more deeply explore concepts and techniques discussed in
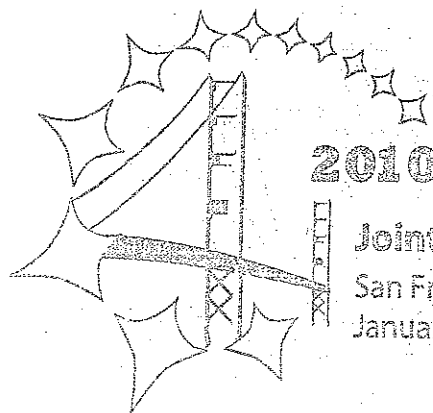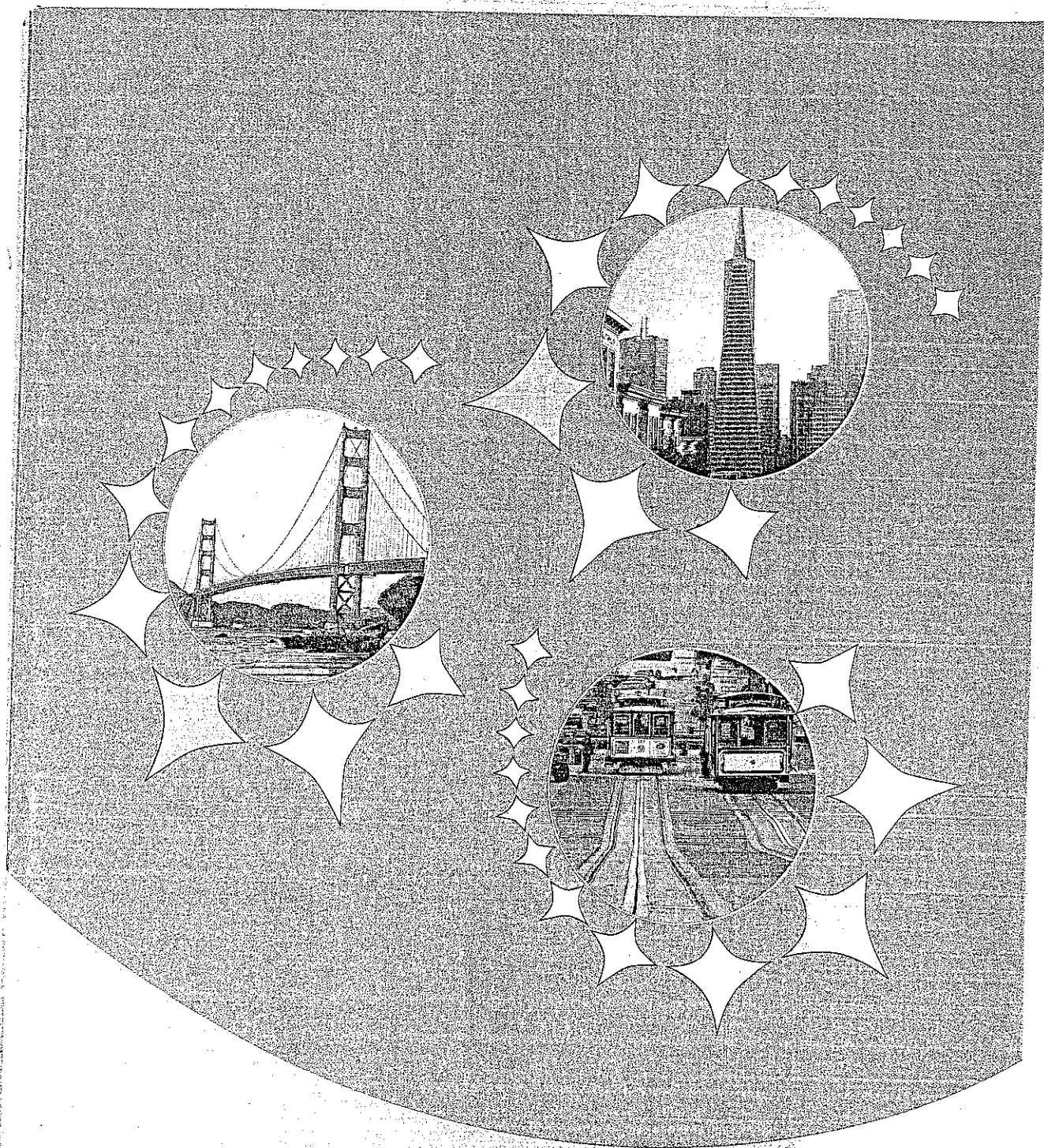
2010 PROGRAM

Joint Mathematics Meetings
San Francisco, CA
January 13–16, 2010

4:45PM *Extremal 2-supereulerian graphs.*
(322) Preliminary report.
Hong-Jian Lai, West Virginia University,
and **Huiya Yan***, University of
Wisconsin-La Crosse (1056-05-536)

5:00PM *The optimal t-rubbling number of the*
(323) *complete m-ary tree.* Preliminary report.
Lisa Danz, Massachusetts Institute of
Technology (1056-05-586)

5:15PM *Simultaneous and non-simultaneous*
▶ (324) *Bulgarian Exchange.* Preliminary report.
Suzanne I Doree, Augsburg College,
Minneapolis (1056-05-651)

5:30PM *Supereulerian Graphs and Hamiltonian*
(325) *Line Graphs.*
Yanting Liang, West Virginia University
(1056-05-731)

MAA Session on General Contributed Papers, II

2:15 PM – 5:55 PM   Room 3000,
                                           3rd Floor, Moscone

Organizers: **Eric S. Marland**,
             Appalachian State University
             Daniel J. Curtin, Northern
             Kentucky University

2:15PM *Huppert's Conjecture and* $PSp_4(q)$.
(326) **Thomas Philip Wakefield**, Youngstown
State University (1056-Z1-336)

2:30PM *Lobb's Generalization of Catalan's*
▶ (327) *Parenthesization Problem and Forder's*
Catalan Triangle.
Thomas Koshy, Framingham State
College (1056-Z1-974)

2:45PM *Why is* $PSL(2,7) \cong GL(3,2)$?
▶ (328) **Ezra Brown*** and **Nicholas A. Loehr**,
Virginia Tech (1056-Z1-379)

3:00PM *The Harmonic Series and Biconvergence:*
▶ (329) *One step forward, two steps back.*
Christopher M Davis, George Mason
University, and **David G Taylor***,
Roanoke College (1056-Z1-387)

3:15PM *Polynomial Root Motion.*
▶ (330) **Christopher S Frayer**, University of
Wisconsin-Platteville (1056-Z1-636)

3:30PM *Mathematics in Signal Processing.*
▶ (331) **Mohamed Allali**, Chapman University
(1056-Z1-646)

3:45PM *A Two-Course Sequence on Mathematical*
▶ (332) *Programming for Undergraduates.*
Paul E. Fishback, Grand Valley State
University (1056-Z1-604)

4:00PM *Bridging Policy and Practice Through*
▶ (333) *Ethnomathematics in the Pacific.*
Linda Furuto, University of Hawai'i
(1056-Z1-39)

4:15PM *Just-in-Time Calculus.* Preliminary report.
▶ (334) **Katherine S. Kelm**, California State
University, Fresno (1056-Z1-1805)

4:30PM *An Action Research Proposal: Does the*
▶ (335) *Ability to Purchase a Week's Worth of*
Groceries for under One Dollar Influence
the Chance that a Student will make an
"Innumeracy Type" Statistical Error?
Preliminary report.
Larry Wayne Lewis, Spalding University
(1056-Z1-1605)

4:45PM *Using Proofs without Words to Explore*
(336) *Rules of Differentiation.*
Tom McMillan and **Jim Fulmer***,
University of Arkansas at Little Rock
(1056-Z1-1601)

5:00PM *The Blip of the Blop: A Successful*
▶ (337) *Mathematics Major Seminar.* Preliminary
report.
Gerald M. Higdon, Fitchburg State
College (1056-Z1-1311)

5:15PM *Statistics-Based Calculus?*
▶ (338) **Patti Frazer Lock**, St. Lawrence
University (1056-Z1-1241)

5:30PM *Mathematics across the Curriculum: A*
▶ (339) *Twenty-year Retrospective.*
Frank Anthony Cerreto, The Richard
Stockton College of NJ (1056-Z1-1309)

5:45PM *Visualizing and Utilizing the Symmetry*
▶ (340) *Method for Differential Equations.*
S. L. Yap, California State University East
Bay (1056-Z1-1443)

MAA Session on Developmental Mathematics Education: Helping Under-Prepared Students Transition to College-Level Mathematics, I

2:15 PM – 4:10 PM   Room 2024,
                                           2nd Floor, Moscone

Organizers: **Kimberly J. Presser**,
             Shippensburg University
             J. Winston Crawley,
             Shippensburg University

2:15PM *College Mathematical Readiness of the*
(341) *Senior High School Students of the Public*
Schools in District I of Davao City,
Philippines.
Melanie Joyno Orig, University of
Mindanao, Davao City, Philippines
(1056-D1-223)

2:35PM *Developmental Mathematics and*
(342) *Assessment: Where have we come from?*
Where are we now? Where are we going?
Preliminary report.
Kimberly J Presser, Shippensburg
University (1056-D1-809)

2:55PM *"Rock Math" a Successful Implementation*
▶ (343) *of a Curriculum Designed to Help*
Under-prepared Students make the
Transition to College Mathematics.
Robert E Burks* and **Eric W. Drake**,
United States Military Academy
(1056-D1-233)