Jeffery Bernstein
The Johns Hopkins University in
Department of mathematical sciences.
501 Saint Paul Street #809, Baltimore MD 21202

A combinatorial approach to dependent spread widening
of defaulting credits in collateralized debt obligations.

The collateralized Debt market is in the trillions and investment banks trade credit default swaps to hedge against market risk. Modeling defaulted bonds in these swaps has become so advanced that mathematicians must come up with models to properly predict worst case market default scenarios. My research provides a new approach to model these worst case events threw combinatorial algorithms and is the first of its kind. Research was first started at a Wall Street firm where I worked as later finished as a Master's Thesis at Fordham University.

ILHAN M. IZMIRLI
AMERICAN UNIVERSITY

SOME NUMERICAL APPROXIMATIONS TO THE ARITHMETIC-GEOMETRIC MEAN

Gauss discovered the existence of arithmetic-geometric mean when he was fourteen and devoted the following ten years of his life to perfecting its theory, which culminated in his calculating the lemniscate integral to eleven places by the simple relation

omega = pi/(2AGM(1,sqrt(2)))

where AGM(1, sqrt(2)) is the aritmetic-geometric mean of 1 and sqrt(2).

In this paper, I will prove some fundamental properties of the arithmetic-geometric mean of two numbers and then use these properties to find some numerical approximations to AGM(a_0,b_0) for certain specific values fo a_0 and b_0.

CHRISTOS XENOPHONTOS
Institution/Organization: LOYOLA COLLEGE
MATHEMATICAL SCIENCES DEPARTMENT, 4501 N. CHARLES STREET,
BALTIMORE, MD 21210
cxenophontos@loyola.edu

A SINGULAR FUNCTION BOUNDARY INTEGRAL METHOD FOR ELLIPTIC PROBLEMS WITH BOUNDARY SINGULARITIES

In this talk we will present a boundary integral method for the efficient computation of the so-called generalized stress intensity factors (GSIFs), associated with elliptic boundary value problems with boundary singularities. The method uses as an approximation the leading terms of the local asymptotic expansion of the solution near the point of singularity, and the GSIFs are calculated directly without any post-processing. Lagrange multipliers are used to enforce any prescribed Neumann boundary conditions, and we note that the resulting boundary integrals are one-dimensional and evaluated away from the point of singularity.

Dr. Mary Kay Abbey
Montgomery College
5815 Ogden Court
Bethesda, MD 20816
marykay.abbey@montgomerycollege.edu

CPR for your classes

Most everyone acknowledges writing is a good learning strategy but the grading is usually the deciding factor to not add to the syllabus. Learn about a program that will do the grading for you.

Maryum Vulis
Queensborough Community College
222-05 56th ave
Bayside, NY 11364
mlvatkb@aol.com, mvulis@qcc.cuny.edu

A Particular Cryptoscheme

I will describe the student project in which the solutions to the 8-queen problem on the 8×8 chess board can be used to build a simple cryptosystem. While the cryptosystem is not secure enough for practical applications, it can be used to teach students about theory and implementation of ciphers.

Daniel Seaton
Department of Mathematics and Computer Science
University of Maryland
Eastern Shore
1136A Kiah Hall
University of Maryland Eastern Shore
Princess Anne, MD 21853
dmseaton@umes.edu

Improving mathematics teaching efficacy beliefs
through professional development

Teachers tend to organize mathematics instruction in ways that are consistent with the ways in which they learned mathematics. Teaching mathematics in ways that are consistent with recent mathematics reform requires a depth and breath of knowledge beyond what most teachers have opportunities to learn. Teachers need opportunities to reconstruct their understanding of mathematics content that is linked to effective pedagogies. This paper describes a program designed to provide elementary and middle school mathematics teachers with opportunities to reconstruct their understanding of mathematics content in a pedagogy implicit setting. Participants report positive perceptions of their experiences as well as significantly improved self-efficacy and outcomes-expectancy beliefs.

Zoltan Szekely
Gallaudet University
800 Florida Ave NE, Washington DC, 20002
zoltan.szekely@gallaudet.edu

Complexity measures in general algebra

We investigate two different kinds of complexity measures for general algebraic questions. One measure is coming from algorithm theory, and desribed by the computational (time) complexity function of the algorithm answering the question. The other measure is based on the set of equations identically true on the algebra.

Jennifer Bergner
Salisbury University
1101 Camden Ave.
jabergner@salisbury.edu

Student calculus labs: Maple was the "devil"

I will share some of the labs and class demos (using Maple) that I have developed for Calculus I. These were written this summer as part of a bigger project of developing calculus labs using Maple that develop the material (in a connected fashion) throughout the three course calculus sequence. There have been a few surprises about what does work and doesn't work for developing student understanding and creating an attitude of exploration regarding the material. These surprises will also be shared.

Dr. Françoise Nelles

Shepherd College
P.O. Box 351
Shepherdstown, WV 25443
drfnelles@hotmail.com

Generating "nice" problems for students

Math educators use "nice" test problems and exercises for students. By "nice," they often mean exercises with integer parameters and solutions. While the pros and cons of offering studnts only "nice" problems may be debated, generating such problems is interesting in its own right. In this paper, elementary number theory -- in particular the Pell equation and elementary congruences -- is applied to generate "nice" exercises which illustrate the Mean Value Theorem. The question is answered in general for simple cubics and some cases of functions involving radicals are discussed.

William P. Wardlaw
U. S. Naval Academy
Annapolis, MD.
wpw@usna.edu

Two Problems Regarding e
(I would like to dedicate the talk to George Mackiw.)

The talk is a discussion of a 1958 Putnam probability problem with expected value of e and a 1978 Monthly problem problem with expected value close to e. Both problems are solved in the talk.

David Carothers
James Madison University
Dept. of Mathematics and Statistics
Harrisonburg, VA 22807
carothdc@jmu.edu

University Mathematics Departments and Middle School Teacher Preparation

This talk will consider the need for much more active involvement of mathematics faculty to support existing programs and to develop new programs in teacher education, with a particular focus on the long-neglected but critical resource of middle grades teachers. JMU has recently developed a collection of advanced mathematics courses specifically designed for future middle school teachers, and this program has helped to encourage continuing collaboration between mathematicians and mathematics educators. In addition to the longer term benefits to the mathematics community in addressing a severe shortage of qualified teachers, we will discuss several substantial and perhaps

unexpected immediate practical benefits for university mathematics faculty and mathematics departments.

Harel Barzilai and Barbara Wainwright
Salisbury University
Dept. of Mathematics and Computer Science
Salisbury University, 1101 Camden Ave, Salisbury MD 21801
hwaustin@salisbury.edu

Authentic Curriculum for Inservice Math Teachers: Modified Lesson Plans.

Math ADEPT is a grant-funded program of graduate courses for inservice math teachers, with a middle school focus. All ADEPT courses incorporate a Modified Lesson Plans (MLPs) assignment in which participating teachers take exiting lesson plans and modify/enhance them based on the instruction in the courses, with input from fellow participating teachers enrollened and from ADEPT instructors. We will share MLPs from three ADEPT courses: Data Analysis, Number Theory, and Conceptual Algebra.

Robert Hanson
James Madison University
Department of Mathematics and Statistics, MSC 7803
Harrisonburg, VA 22807
hansonjr@jmu.edu

Discovery Learning in Geometry

Use the centroid of any triangle to partition the triangle into six sub-triangles. The centroids of these sub-triangles determine a hexagon with surprising and lovely properties, some of which will be established using theorems of Pappus and Pascal.

Ezra Brown
Virginia Tech
Math Department, Virginia Tech, Blacksburg, VA 24061-0123
brown@math.vt.edu

Three Connections to Continued Fractions

It is often the case that seemingly unrelated parts of mathematics turn out to have unexpected connections. In this talk, we explore three puzzles, concerning (1) a mistake, (2) a mystery, and (3) a whole lot of cows, and see how they are related to continued fractions, an area of mathematics with a distinguished history within the world of number

theory.

Fat C. Lam
Gallaudet University
800 Florida Ave, NE
Washington, DC 20002
fat.lam@gallaudet.edu

Generation of Pythagorean Triples Using Bases and Slopes.

Instead of the [x, y, z] representation of a pythagorean triple, such as [3, 4, 5], a new and simpler representation in the form (b, m) where b is a base and m a slope, is presented. This method of generating pythagorean triples is based on geometry, thus providing a link between geometric generation and the Pythagorean triples.

Dr. Roman Sznajder
Department of Mathematics
Bowie State University
14000 Jericho Park Road
Bowie, MD 20715-9465
rsznajder@bowiestate.edu

On P-properties of linear transformations on Euclidean Jordan Algebras

A real square matrix is said to be a P-matrix if all its principal minors are positive. In this article, we extend this notion and several of its equivalent versions to a linear transformation defined on a Euclidean Jordan algebra. We study some interconnections between these extended concepts and specialize them to the space S^n of all $n \times n$ real symmetric matrices with the semidefinite cone S^n_+ and to the space R^n with the Lorentz cone.