Ilhan M. Izmirli
Strayer University
1025 15th Street NW Washington, D.C. 20005

Some Problems on Magic Squares, Difference Triangles and Permutations

Two or three sentence description of the proposed talk: => The talk consists of solutions of three problems: Properties of an "almost" magic square,construction of difference triangles, and finding integers x, y, .. such that the digits of the square of x is a permutation of the digits of the square of y,... etc.

Bogdan Gavrea
University of Maryland, Baltimore County
1000 Hilltop Circle, Baltimore, MD 21250

A Hadamard Type Inequality

We introduce the basic Hadamard inequalities as the starting point of this presentation. Our goal is to generalize these inequalities using some particular linear functionals. In the end of the talk we will present some nice applications to the main result.

Fozia S. Qazi
St. Mary's College of Maryland
173 Schaefer Hall, Dept. of Math and CS, 18952 E. Fisher Rd.,
St. Mary's City, MD 20686

Some Thoughts on Teaching a Course on Mathematics of Finance

This talk will give an overview of the experiences of teaching a course on financial derivatives and the different methods used in pricing these derivatives.

Jerome Dancis
University of MD
College Park, MD 20742-4015

Beware the pretend MD state Algebra test

A MD state High School Assessment on pretend Algebra and pretentious data analysis is coming. The level of conceptual understanding and problem solving is often trivial; certainly lower than the new CA Grade

6 Math curriculum. Students will arrive in college with even weaker backgrounds in algebra.

William Ott
University of Maryland
Mathematics Department
University of Maryland
College Park, MD 20742

Dimension Spectra of Attractors and Projection Theory

How much information is retained when a subset of a metric space is mapped into a finite-dimensional space? I will address this question from a dimension-theoretic perspective and discuss applications of the projection theory to the study of attractors.

Richard Hammack
Randolph-Macon College
Mathematics Department
Randolph-Macon College
Ashland, VA 23005

An informal approach to formal inner products

Second semester linear algebra students often feel that the axiomatic definition of a formal inner product has no geometric rationale. We address this objection with an alternative introduction to formal inner products, where intuitively plausible assumptions about length and orthogonality lead to the inner product axioms. This is the reverse of the standard approach in which the axioms are laid out and the notions of length and orthogonality are derived from them.

Dr. Jennifer Bergner
Salisbury University
1101 Camden Ave, Dept. of Math/CS, Salisbury,MD, 21801

Metaphor and Mathematics

It has been proposed that the use of metaphor and other forms of analogical reasoning are an important component in mathematical teaching and learning. To date, few empirical studies have been done to investigate this and so in the Spring of 2202 an empirical study was carried out to see if metaphor was used in a college geometry course and if it was, how. The presenter plans to share some student metaphors and other interesting findings about the role metaphor can play in communicating mathematically with our students.

Hanson, John Robert
James Madison University
Department of Mathematics and Statistics

A look at Billiards

This talk will demonstrate that any shot from a corner of a rectangular billiards table will always reach a pocket if the ball rolls long enough and the slope of the shot and the dimensions of the table are rational numbers. Under these conditions it will be shown how to find the pocket into which the ball falls, the length of the path and the number of times the ball banks off a cushion. Uniqueness of the starting and midpoint of ball-reaching paths and the case for real table dimensions and shot slope will be examined.

AMIT TREHAN
UNIVERSITY OF MARYLAND, COLLEGE PARK
DEPARTMENT OF MATHEMATICS, UNIVERSITY OF MARYLAND,
COLLEGE PARK. MD 20742

CHARACTER THEORY OF COVERING GROUPS

I will be talking about the transfer of representations between two groups. One of the groups in question will be a non-linear group (i.e a group which is not a matrix group) and that gives us very unexpected and interesting results. These results could be useful towards knowing more about automorphic forms which have been extensively studied in the last 50 years.

Paul B. Massell
U.S. Census Bureau
Room 3209-4
4700 Silverhill Road
Washington, DC 20233-9100

Two Algorithms for Solving the Cell Suppression Problem

The complementary cell suppression (CCS) problem arises when an organization releases statistical tables in which some of the cells are suppressed because they contain sensitive data. If the table is additive, the suppressed data may be recovered unless additional cells are suppressed to protect the sensitive ones. The CCS is the problem of determining how to minimize disturbance to the released table, while providing adequate protection to the suppressed cells. This practical problem can be formulated and solved using standard mathematical programming methods; viz., network flow models and linear programming.

Homer Austin and Harel Barzilai

Salisbury University
Department of Mathematics and Computer Science,
Salisbury University, 1101 Camden Ave, Salisbury Maryland 21801

The ADEPT Program at Salisbury University

ADEPT (the Allied Delmarva Enhancement Program for Teachers) is based on two grants, with funding from the National Science Foundation (NSF) and the Maryland Higher Education Commission (MHEC) and is a program of graduate credit bearing courses in mathematics designed for teachers who teach or intend to teach math at the middle school level. We will describe the grants and the eight interconnected courses developed for this program; outreach efforts; outgrowths in the form of a Certificate (Diploma) in Middle School Mathematics and a Master of Science in Math Education (MSME). We will discuss the challenges and successes based on the preliminary assessment done to date.

Ezra Brown
Virginia Tech
Department of Mathematics, Virginia Tech, Blacksburg VA
24061-0123

The Many Names of (7,3,1)

This is a story about a single object, lving in the world of discrete mathematics, that makes many connections. It is a difference set, a block design, a Steiner triple system, a finite projective plane, a complete set of orthogonal latin squares, a doubly-regular tournament, a skew-Hadamard matrix, and the graph Heawood used to prove the 7-color theorem on the torus.

Dr. Roland Minton
Roanoke College
Salem, VA 24153

The Mathematics of Golf Drives

A realistic model of the flight of a golf ball takes into account gravity, air drag and the Magnus force. The resulting ODE cannot be solved explicitly, but ccan be approximated numerically on the TI-89. Examples will be shown, focusing on the question of why Tiger Woods hits the ball so far.

Susan Schwartz Wildstrom
Walt Whitman High School
Bethesda, MD

Reading and Journals and Websites, Oh My!

Two or three sentence description of the proposed talk: => I use journals with my students as a means of keeping open lines of communication about their prior math experiences and the quality of the math experiences they are having in the courses I teach them. I use a reading and internet assignment with students to encourage them that one can read mathematics for pleasure and that research on the internet is a skill worth learning--including assessment of sites as to correctness, value and usefulness. I maintain a website which enables students (and in high school, their parents) to obtain copies of many sorts of handouts including assignments and worksheets.

Dr. George DeRise
Thomas Nelson Community College
Hampton, VA 23602

"God's Beautiful Mathematics"

This summer I attended "Strings 2002 Conference" in Cambridge, England. At the culmination of the conference was the "Dirac Centennial Celebration" with Sir Michael Atiyah and Stephen Hawking among the lecturers. In my talk some examples are presented illustrating Dirac's famous statement, "God used beautiful mathematics in creating the world".
I will also recount some personal thoughts on staying at Trinity College, Cambridge, the home of Newton, Stokes, Hardy, Dirac and Hawking.

ROMAN SZNAJDER

Bowie State University
Department of Mathematics
Bowie, MD 20715-9465

Hyperbolic Geometry Calculator

We will demonstrate the Hyperbolic Geometry Calculator, which is a collection of MATLAB files and serves as a teaching tool for the hyperbolic geometry. This calculator refers to the upper half-plane Poincare model. It is an interactive device that explores basic relations of the non-Euclidean geometry.

Eve Torrence and Bruce Torrence
Randolph-Macon College
Dept. of Mathematics
Randolph-Macon College, Ashland, VA 23005

Fietsen, Dijken, en Wiskunde: A Sabbatical in the Netherlands

We have just returned from a wonderful 6 month sabbatical in the Netherlands. Eve visited the Freudenthal Institute and Bruce visited the Mathematics Institute both at the University of Utrecht. We will discuss our experiences, both professional and personal.

Mieczyslaw K. Dabkowski
Graduate student
The George Washington University
Departament of Mathematics
2201 G St. NW
Washington, DC 20052

Counterexamples to some elementarily formulated conjectures in Knot Theory

The pth Burnside group of a link allows us to provide conterexamples for some old conjectures in Knot Theory. In particular, we discuss counterexamples for Montesinos-Nakanishi 3-move and Nakanishi-Hirakae (2,2)-move conjectures.

Dr. John Osoinach
Hampden-Sydney College
Box 74; Hampden-Sydney, VA 23943

Outwitting the Lying Oracle

An oracle, who can predict the future but occasionally lies, asks you to place bets and then guess the outcome of a coin toss, based on what the oracle tells you. The question is: How should you place your bets so that you get the greatest amount of money in the end, no matter what the oracle does? Furthermore, can you outwit the oracle; that is, can you improve your outcome by disagreeing with the oracle's predictions? Does the size of your bet influence the oracle's decision to lie or be truthful?

Dan Kalman
American University
4400 Massachusetts Avenue NW, Washington DC, 20016

The Fibonacci Numbers -- Exposed

Everyone knows about the Fibonacci Numbers. With all of its amazing and fascinating attributes, it is a sort of super-sequence. But what if, like superman, it is really just a rather pedestrian speciman of an entire super-race? Perhaps it acquires all of its powers from the planet of its birth, and in that setting would be neither amazing nor unusual. In this case, the home world is the planet of two-term recurrences, where Fibonacci is just an ordinary Joe.

In this talk I will review a number of famous Fibonacci properties, some well known, others less familiar, and show that they are quite common among others of Fibonacci's kind. So, super sequence, or just a mild mannered recursion? Let the listener decide.

BASHIR M. DWEIK
AMERICAN UNIVERSITY, WASHINGTON, DC 20016
3140 Wisconsin Avenue NW
Apt 717
WASHINGTON, DC 20016

Mixtures of Erlang Distributions and Renewal Processes Based on Them

Mixtures of Erlang distributions are useful in both mathematical analysis and statistical genetics. They are formed by mixing different Gamma distributions with varying positive integer shape parameter j (also called Erlang) and common scale parameter l with a discrete mixing distribution (s1, s2, s3, ...). Different mixtures of Erlang

distributions can yield varieties of distributions including basic ones like exponential or gamma distributions and more complicated ones like multi-modal distributions. In this work we will give some basic definitions, theorems, properties, examples and graphs related to these distributions. We will discuss different estimation methods for estimating the skip distribution and the scale parameter with emphasis on the least squares method. Renewal processes with Erlang mixtures interevents are briefly mentioned. The last section describes the future work we propose to do to expand our work with Erlang mixtures and models for genetic recombination and networking data.
Keywords and phrases: Erlang Mixtures, Erlang mixtures renewal processes, genetic recombination, multilocus probabilities, alternating renewal processes.

Brooke Evans
American University
4400 Massachusetts Ave.
Washington, DC 20016

Successful Techniques for Students with Learning Disabilities

This presentation will outline successful techniques for teaching university required mathematics to students with learning disabilities. It will also include some preliminary results from a dissertation study examining the success of students with learning disabilities in university required mathematics courses.

Geoffrey R. Goodson
Towson University
Mathematics Department, Towson University, Towson, MD 21252

Eigenvalue and Jordan Block Pairings Arising From Real and skew-Symmetric Normal Matrices

We study the consequences of equationsuch as AB=BA and AB=BA^T on the eigenvalues and Jordan blocks of B when A is a normal matrix that is real or skew-symmetric. Our main result is an eigenvalue and Jordan block pairing
theorem for such matrices. An important tool used is a canonical form for these matrices. This is joint work with Dennis I. Merino.

William May
Johns Hopkins University
Department of Mathematical Sciences
Johns Hopkins University
104 Whitehead Hall

3400 N. Charles Street
Baltimore, MD 21218

Using Symmetry to Improve Percolation Threshold Bounds

We show that symmetry, in the form of a graph's automorphism group,
can be used to greatly reduce the computational work for the substitution method. This allows us to apply
the substitution method over larger regions of the problem lattice, resulting in tighter bounds on the percolation threshold p_c. We demonstrate the algorithm using bond percolation on the $(3,12^2)$ lattice, where we improve the bounds on p_c from
$(0.738598,0.744900)$ to $(0.739399,0.741757)$ a reduction of more than 62\% in width, from 0.006302 to 0.002358.

Richard Kollar

University of Maryland College Park
Math Department, University of Maryland,
College Park, 20742 MD

Slow damping of internal waves in a stably stratified fluid

We study the damping of internal gravity waves in a stably stratified fluid with constant viscosity in two- and three-dimensional bounded domains. For the linearized Navier-Stokes equations for incompressible flow with no-slip boundary conditions that model this fluid, we prove there are non-oscillatory normal modes with arbitrarily small exponential decay rates. (joint work with R.Pego and K.Gurski)

David Lindsay Roberts
Independent scholar
12226 Valerie Lane
Laurel, MD 20708

Simon Newcomb: Adventures of a nineteenth-century American mathematician in mathematics education

Simon Newcomb (1835-1909) rose from educationally deprived conditions in rural Nova Scotia to become head of the United States Navy's Nautical Almanac Office and a professor of mathematics at Johns Hopkins University. Along the way he devoted considerable attention to mathematics education, at the undergraduate level and below. This talk will survey Newcomb's career in mathematics and his educational ideas.

Ashvin Rajan
Loyola College in Maryland
4501 North Charles Street
Baltimore, MD 21210

An expository account of Fermat's Last Theorem for Polynomials, and the abc conjecture

We prove Fermat's Last Theorem for polynomials as a consequence of a theorem in Diophantine Analysis proved by R.C. Mason, and use the intuition gained from this theorem to state the abc conjecture, and sketch a possible proof of Fermat's Last Theorem for the integers that would follow if the abc conjecture were true.

G. Edgar Parker
James Madison University
Harrisonburg, VA 22807

Picard Iteration and Polynomial Projection: A Summary of Results and Questions

In 1988 Sochacki and Parker proved that, for an ordinary differential equation with a polynomial generator on R^n and initial conditions at 0, Picard iteration, properly modified, yields the Maclaurin polynomials of successively higher degree. In the succeeding decade, a theory has been built around this theorem that has clarified and expanded its applicability; this talk will present an overview of the theory, with particular attention to the algebraic structures involved and applications they support, and accompanying unresolved questions. Accompanying talks (by D. Carothers, J. Sochacki, and P. Warne) will explore specific theorems and applications.

David Carothers
James Madison University
Harrisonburg, VA 22807

Projectively Polynomial and Analytic Functions

Function u is projectively polynomial if it is one of the components of the solution to a first order system of differential equations in variables v1, v2,.,vn in which each vj' may be written as a polynomial function of v1, v2,.,vn. Parker, Sochacki, et. al. have considered the numerical solution to such systems of differential equations. We show that for a given projectively polynomial function it is possible to replace the system of differential equations with a new

system involving polynomials of degree at most two, and in addition the existence of analytic functions that are not projectively polynomial is demonstrated.

James Sochacki
James Madison University
Department of Mathematics and Statistics MSC 7803
Harrisonburg, VA 22801

Applying the Modified Picard Method
in a
Symbolic and Numeric Computing Environment

G. Edgar Parker and David Carothers presented results to show the feasibility of using the Modified Picard Method in solving initial value ordinary differential equations (IVODE's). In this talk I look at some specific examples, including Newton's method, polynomial inversion, linear and quadratic IVODE's. A general symblic and numeric code for solving linear and quadratic IVODE's is given. I close with Newton's N Body Problem including an animation of our solar system.

Paul Warne
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The Modified Picard-Pade' Approximation Method for Singular Nonlinear Boundary Value Problems

For singular nonlinear boundary-value problems (BVPs) a shooting procedure using a foundation of the modified Picard method can potentially produce better accuracy in less time near the singularity, when contrasted with many standard algorithms using a Runge-Kutta foundation. Using Cauchy products, the modified Picard method generates the coefficients of the Maclaurin polynomial of the solution; subsequently, these coefficients are used to create a rational polynomial Pade' approximation to the solution. The modified Picard-Pade' algorithm provides a simple manner in which to increase/decrease the order of the algorithm during computation, resulting in general in a more accurate solution nearby and at the singularity. This modified Picard-Pade' shooting method is first developed theoretically and then demonstrated for a particular singular test problem which is compared

against a standard Runge-Kutta procedure as well as for a singular nonlinear BVP associated with cavitation (void formation in solids).