Schedule for Iowa Section MAA meeting

Friday

7:00 to 8:00 Invited Talk by David Stone
– Georgia Southern University

Math Problems – the Eternal Lure
(Walker 002)

8:00 to ???? Informal social gathering
(Randolph Room)

Saturday

8:30 to 9:30 Invited Talk by David Stone
– Georgia Southern University

Counting on Lotteries
(Walker 002)

9:45 to 11:00 **Assessment Workshop**
Sandy Keith & Scott Searcy

11:15 to 12:15 **Business Meeting**

12:15 to 1:30 **Lunch (on own)**

1:30 to 3:30 **Concurrent Sessions**
(See Schedule Below)

Candidates for Chair-Elect:

Joel Haack has been employed at the University of Northern Iowa since 1991, first as department head for 9 years, then as interim dean, and now as (blessedly) a faculty member. His degrees (the usual ones in Mathematics and an MA in Statistics) are from the University of Iowa, with his thesis in non-commutative ring theory. His position previous to that at UNI was at Oklahoma State University, where his scholarly interests expanded to include curriculum development and the relationships between mathematics and the humanities. He presently serves as an Associate Editor of the Humanistic Mathematics Network Journal.

Keith Stoyan joined MAA in the late 60's while studying at Caltech, where he received his Ph. D. in 1971. He held a postdoctoral position at the University of Wisconsin - Madison, visiting positions in Paderborn, Germany, and Trondheim, Norway, and joined the U of Iowa faculty in 1973. His research has centered on applications of Abraham Robinson's theory of infinitesimals in complex variables, functional analysis, mathematical economics, and probability. He wrote two monographs on infinitesimal analysis.

Since the 70's he has been developing computer materials for various undergraduate courses, including Calculus Wiz for the traditional course. Through the 80's Keith's summer hobby was running workshops for high school teachers on geometry and vector graphics for Apple and Atari computers. He spent most of the last decade in reform school, that's Calculus Reform, and wrote the materials Calculus: The Language of Change with both Mathematica and Maple software. His current effort is an interactive text for multivariable calculus (all featured on his website above.)

Keith has a grown daughter and lives in the free part of Johnson County where he and his wife raise Labrador retrievers and watch the encroaching real estate development.

Keith supports the nomination of his friend Joel Haack enthusiastically, but is also willing to serve if it's Iowa's turn. One of the nice things about the Spring MAA meetings is the opportunity to visit campuses around the State.

Candidates for Secretary-Treasurer:

Dan Alexander received a PhD in Mathematics from Boston University in 1992, and has been teaching at Drake since the Fall of 1993. His mathematical research interests involve the history of mathematics. In the past few years he has been heavily involved with Drake's online summer program, and is currently also serving as Drake's Director of Web-Assisted Curriculum.

Wendy Weber received her doctorate in mathematics from the University of Kentucky in 1999 in convex geometry under the direction of Carl W. Lee. Since she graduated she has been a Project NExT fellow (1999-2000) and an assistant professor of mathematics at Central College in Pella, Iowa. Her current interests include the mathematical education of prospective teachers and planning campus wide activities for Mathematics Awareness Month.

Walker 163

1:30 – 1:55

A New Look At An Old Problem

Scott Searcy
Waldorf College

Abstract. A novel approach to show the divergence of the improper integral of the harmonic function ($f(x) = \frac{1}{x}$) using convergent improper integrals.

2:00 – 2:25

A solution to the quincunx or "Plinko" problem using Markov Chains

Eric Canning
Morningside College

Abstract. A method, utilizing Pascal's triangle, for determining the probability distribution of a Plinko board was published several years ago. However, it is incorrect. A method using Markov Chains offers a correct and nifty solution to the problem.

2:30 – 2:55

Teaching Multivariable Calculus Using Mathematica

Al Hibbard
Central College

Abstract. In this talk I will look at some Mathematica notebooks that I have recently developed that can be used in teaching multivariable calculus. I will also illustrate a java applet that can take 3-dimensional graphical output from Mathematica and allow one to manipulate it.

3:00 – 3:25

Special digraphs that arise in some matrix completion problems

Luz M. DeAlba
Drake University

Abstract. A partial matrix is a (square) matrix in which some entries are specified and others are free to be chosen. A matrix completion problem involves selecting the unspecified entries of a partial matrix so that the resulting complete matrix has certain properties. A P-matrix is one in which all principal minors are positive, while a P0-matrix has all principal minors nonnegative. In this talk we explain how to construct digraphs that represents partial matrices, then we discuss the P- and P0-matrix completion problems from the point of view of special graphs associated with partial P and P0-matrices.

Walker 165

1:30 – 1:55
Hadamard's Real Inequality
(or why you should always use the integral version of the remainder)

A. M. Fink
Iowa State University

Abstract. Hadamard's theorem says that an integral of a convex function over a finite interval is at least as large as the value at the midpoint for any probability measure that is symmetric with respect to the midpoint. We show that the correct version requires neither that the measure be positive nor symmetric. All you have to do write the correct version.

2:00 – 2:25
Interactive Multivariable Calculus

Keith Stroyan
University of Iowa

Abstract. Over the last few years we have been developing materials for multivariable calculus that use modern computing to help students in math, science, and engineering learn this fundamental subject. Computing can help students understand the material at a conceptual level and, if used appropriately, can enhance traditional skills.

A large part of student work still needs to be similar to a traditional class, but our prototype contains computer graphics and moving animations that extend the graphical innovations of several earlier reform projects. These help students begin to learn many traditional topics. With only a modest amount of computing, students themselves can also explore a broader class of examples. Beyond this, computing offers the promise of greatly expanding the kinds of problems students can actually solve and WebMathematica will allow students to compute on a regular web browser.

2:30 – 2:55
The Interactive Geometry Software Cinderella

Ruth I. Berger
Luther College

Abstract. The new interactive Geometry software Cinderella allows you to do sketches in Euclidean Geometry, Hyperbolic Geometry and Elliptic Geometry! This talk will be a brief introduction to Cinderella for those of you who have not seen it before. Cinderella has its advantages (and disadvantages) over Geometer's Sketchpad. Come and see for yourself how it could improve your Geometry course.

3:00 – 3:25

What is a Point of Inflection?
A Preliminary Report

A F Kleiner
Drake University

Abstract. Freshman calculus texts tend to give a "casual" definition of inflection point using concavity and/or a tangent crossing. This note will survey the recent history of the concept as it appears in calculus texts and journal articles. Several approaches to the definition will be compared.

Walker 162

1:30 – 1:55

Markov Chain Monte Carlo and its Applications

Dianne Schmidt
University of Iowa

Abstract. Markov Chain Monte Carlo is well-known technique to solve the Monte Carlo Integration using Markov Chains. Its applications are rapidly into many scientific subjects – Bayesian analysis, Biomedicine, Economics, Environmental Statistics, Computer Science, Education, Engineering and so on. Metropolis Hasting Algorithm is the major algorithm in MCMC. Gibbs Sampler is solving the analytically and numerically difficult problems.

2:00 – 2:25

A Parenthesis-free Notation Method of Writing Logic Statement Forms

Doug Kilburg (Student)
University of Northern Iowa

Abstract. We give a brief introduction to parenthesis-free notation (Polish notation) and present an algorithm for determining whether a given expression is a statement form in Polish notation.

2:30 – 2:55
Teacher Evaluation by Calculus Students

Irvin Roy Hentzel
Iowa State University

Abstract. All math classes at Iowa State University give a student evaluation at the end of the course. These evaluations have several questions dealing with the instructor, the book, the tests, and other points of interest. These responses are averaged over the section. I compared these averages with the grades given to the students in that section. I also compared long-term correlations between the performances of students in successive courses. I wanted to answer questions like these. Do high grades correspond to good teacher evaluations? If a section gives the teacher a good evaluation, do these students do better in subsequent semesters of calculus? Do full professors, associate professors, assistant professors, instructors, or visiting professors distribute grades differently? Do the students seem to prefer any of these levels of teachers over another?

3:00 – 3:25
A Mathematical Geneology – Part 1

Mark Sand
Dana College

Abstract. Did you ever wonder, while struggling through graduate school, under whom your dissertation advisor worked? I have begun the process of looking up my advisor's advisor, and then further back. Some fascinating stories have been found, and there should be more to come.