10th Annual Kansas City Regional
MATHEMATICS TECHNOLOGY EXPO

at the Richardson Science Center, Rockhurst University, Kansas City, MO
Friday and Saturday, October 6 and 7, 2000

Schedule of Events and Abstracts

We thank the Kansas City Professional Development Council (KCPDC) for sponsoring many EXPO participants, and Johnson County Community College for funding paper and printing for all EXPO mailings.
Our thanks also go to the following individuals from Rockhurst for their technical support of the EXPO: Matt Heinrich, Director of Computer Services; Bryan Shrivener, Help Desk Manager; and Steve Hoog, Audio/Visual/Multimedia Coordinator.

Registration in the lobby of Richardson Science Center:
Friday, 8:00 a.m. - 1:45 p.m., and Saturday, 8:00 a.m. - 1:00 p.m.

Complimentary continental breakfast:
Available in the registration area both Friday morning (sponsored by Academic Systems) and Saturday morning (sponsored by KAMATYC and AMATYC). Coffee and tea will be available throughout both days.

Lunches:
Friday and Saturday lunches are both all-you-can-eat buffets for $6.50 apiece.
Friday's buffet has a variety of items including a deli bar, salad bar, and hot entrees.
Saturday's buffet also has a variety, including "brunch" items, salad bar, and pizza bar.
Lunches were ordered with the pre-registration, but there may be some available for purchase at the registration table.

Technology Display Area located in the Conference Lounge, Room 206
Friday, 10:15 a.m. - 3:30 p.m.; Saturday, 8:00 a.m. - 2:45 p.m.
Hands-on Displays of Graphics Calculators & Mathematics Software:
TI-83+, TI-86, TI-89, TI-92+, TI-CBL, TI-CBL2, TI-CBR, TI Presenter, Sharp EL9600, Casio Algebra FX 2.0 , CFX9850+, FX 7400+, Converge, Derive 5, Geometer's Sketchpad, Mathematica 4.0, MathType, ISETL, MapleV, Symantec Cafe, TI Interactive, Xpander, plus Internet access, and *MS Office.*

Textbook, Hardware, and Software Exhibitors:
Fri., 8:00 a.m. - 2:45 p.m.; Sat., 8:00 a.m. - 1:00 p.m. (Not all exhibitors will be present on Saturday.)
Academic Systems, Addison Wesley Longman, Casio, Harcourt Brace, Houghton Mifflin, LiveMath, MAA, McGraw Hill, Prentice Hall, Texas Instruments, Thomson Learning

FRIDAY, October 6, 2000

Welcome and Introductions

8:45 a.m. in **Room 115**
Marian VanVleet, 2000 EXPO Group Chair, Saint Mary College, Leavenworth, KS
Elizabeth M. Brent, Ph.D., Vice President for Student Development, Rockhurst University, Kansas City, MO

SESSION 1 - Keynote Address

8:50 a.m. - 10:00 a.m.
Room 115

Interactive Multivariable Calculus

Keith Stroyan
University of Iowa, Iowa City, IA

Outspoken advocate of calculus reform, author of six undergraduate textbooks, including *Calculus: The Language of Change*, author of the software *CALCULUS WIZ!* [http://www.math.uiowa.edu/~stroyan]

In this talk we will look at ongoing efforts to develop a combined print and electronic text for multivariable calculus, linked to many sources at appropriate points. See http://**www.math.uiowa.edu/~stroyan/multicalc.htm**
Animation can make the visualization and motion inherent in 3-dimensional calculus more accessible to students. We will explore: building graphs from slice curves, direction of steepest ascent, zooming in on surfaces and contour graphs, the changing velocity and acceleration of a moving point, the flow of a vector field.
Materials like these can help students master the traditional topics, but also make it possible for them to study more interesting, more varied, and deeper problems.

SESSION 2

Friday, 10:15 a.m. - 11:00 a.m.

2A. ***Dynamic Geometry Software - It's Not Just for Geometry Class Anymore!***
Room 203 **Richard Gill, Blue Valley High School, Stilwell, KS**
Dynamic geometry software is a problem solving tool that students can learn to use for a variety of problem situations. This presentation will consider representative problems from algebra to calculus and show how they can be solved using Geometer's Sketchpad. This presentation is designed so that prior experience is not needed. All participants will have access to previously prepared sketches. Non-users will be able to participate equally with experts.
Presider: Libby Holmgren, Johnson County Community College, Overland Park, KS

2B. ***Finding and Using History of Mathematics on the Internet***
Room 205 **Linda Hand and LaShall Crane Bates,**
Missouri Southern State College and University of Arkansas at Fayetteville
This talk focuses on the incredible amount of historical information found on the World Wide Web. As her Senior Honors Project at Missouri Southern State College, LaShall Crane Bates created a web site that organizes hundreds of links to mathematical biographies, maps, photographs, drawings, and other mathematical and historical topics by person, culture, or type of mathematics. Links to applets that may be used as teaching tools, as well as games and video clips may be found. This is an ongoing project that continued through the summer. Our talk will describe the website and show various links and how they can be

used in a classroom situation.
HOMEPAGE: www.mssc.edu/math/lhand WEBSITE: members.xoom.com/LaShall
Presider: Joe Kincaid, Peru State College, Peru, NE

2C. ***Polynomial Algebra and Music*** **CDS**
Room 302 **Andy Bennett, Kansas State University, Manhattan, KS**
I have used questions in communication theory to motivate students in Intro to Algebraic Systems, a modern algebra course for pre-service teachers. In this talk I will illustrate how to use the internet and modern technology to motivate advanced mathematics, as well as how to use web pages to allow for student experimentation in advanced mathematics courses.
Courses Targeted: Algebra (from college algebra through modern algebra)
Students' Expertise: Ability to work a web browser
Audience's Expertise: Ability to work a web browser and a foggy memory of a modern algebra course
www.math.ksu.edu/~bennett
Presider: Ken Eichman, Longview Community College, Lee's Summit, MO

2D. ***Building a Learning Community of Students Through Calculus Conversations on the Internet***
Room 306 **Anita Salem, Rockhurst University, Kansas City, MO**
The presenter will describe a project she has been working on which involves building a learning community of calculus students across a three-semester calculus sequence. The primary communication network for the community will be through a Web-based threaded discussion using WebCT. Students are encouraged to frame thoughtful questions on their own, pose new problems, and respond to questions and problems posed by others. The question being investigated is whether and how student performance on conceptual questions can be correlated with the quality of their participation in the Web-based threaded discussion. The presenter will demonstrate the advantages and limitations of using *WebCT* for this project and her conclusions about the effectiveness of this approach to introducing conceptual questions in calculus. A five-minute video of a classroom discussion will also be shown. Funding for this project came from a year long fellowship funded by the Carnegie Foundation for Teaching and Learning.
Possible courses targeted: Calculus I, II, III.
Level of technical expertise expected of students and EXPO audience: Some experience with an Internet browser is useful
No *WebCT* experience needed.
Presider: Richard Delaware, University of Missouri - Kansas City, Kansas City, MO

SESSION 3
Friday, 11:00 a.m..

3A. ***Exhibitors and Technology Display Area*** [45 min.]
Lobby & Room 206 This time is provided especially so that EXPO participants will have a chance to visit the Exhibitors in the lobby of the Richardson Science Center and the Technology Display Area (TDA) located in the Conference Lounge, Room 206. In the TDA, participants can have hands-on experience with a variety of calculators and software packages that are being used in EXPO presentations. Extra handouts from EXPO sessions will be made available in the Conference Lounge. The Exhibitors Area and the Conference Lounge will also be open at other times during the EXPO.
Technology Display Area: Nic LaHue, Penn Valley Community College, Kansas City, MO

3B. ***WORKSHOP: Learning Appliances (specifically "Xpander"): The Future of Technology in Education***
Room 123 (A Commercial Demonstration) [90 min.]
G.T. Springer, Hewlett Packard, formerly from Alamo Heights High School, San Antonio, TX
NEW As technology in general goes mobile, dynamic, and interactive, what can we expect to see in our classrooms? Come participate in a hands-on demonstration of a new type of technology: the learning appliance. This device features dynamic and interactive software for learning mathematics, plus the promise of expandability to other subject areas. This workshop will focus on new teaching opportunities that this technology makes possible, as well as familiar activities that this device facilitates. Come experience technology that was designed from the

ground up to encourage active exploration of mathematical concepts.
Presider: Joe Yanik, Emporia State University, Emporia, KS

SESSION 4

Friday, 11:45 a.m. - 12:30 p.m.

The three small discussion groups (4B, 4C, and 4D) are not formal talks, but are organized to encourage conversation among EXPO participants about the larger questions of teaching with technology. Each session will be moderated by EXPO Group members, and notes of the discussions will be made available on the EXPO Web site following the EXPO. NOTE: 4A is a talk, not a discussion.

4A. ***EXPO Showcase: Derive 5 Live!***
Room 203 **Ken Eichman, Longview Community College, Lee's Summit, MO**
This is another in a series of sessions that are presented by members of the Math EXPO Steering Committee to showcase new technology. The purpose of this particular session is to highlight the improvements in the newest version of the *Derive* software. The new features will be demonstrated and compared to the features of the previous version. Then, time will be allowed for participants who have some experience with Derive to experiment with the software. There will be a handout with a variety of mathematical exercises, for participants to work from.
Presider: Mike Brown, Longview Community College, Lee's Summit, MO

4B. **Discussion:** ***Concepts Without Technique: A Hollow Frame? (e.g. TI-89)***
Room 205 **Moderator: Carl Anderson, Johnson County Community College, Overland Park, KS**
Calculators such as the TI-89 allow students to carry algebra systems in their pockets instead of in their heads. Theoretically they should have more time to study concepts since they no longer need to learn the skills and techniques necessary to "do" such things as factoring, solving equations, differentiating and integrating. This discussion group will focus on the pros and cons of learning concepts without techniques.
Presider: Libby Holmgren, Johnson County Community College, Overland Park, KS

4C. **Discussion:** ***Distance Education - Time Warp or Time Sink?***
Room 302 **Moderator: Nic LaHue, Penn Valley Community College, Kansas City, MO**
Distance education has taken on a variety of forms through the years: radio, TV, videotapes, correspondence courses and more recently cable TV and the internet. Is distance education the way to reach the masses with a minimum investment? Can distance education courses be set in place and then run freely on their own with little or no need of a teacher? How will the integrity of the program or institution be maintained within distance education? What's the next step in the changing world of distance education?
Presider: Richard Gill, Blue Valley High School, Stilwell, KS

4D. **Discussion**: ***How Much Computer Science is Needed to Learn a Computer Algebra System?***
Room 306 **Moderator: Joe Kincaid, Peru State College, Peru, NE**
On many campuses, computer science was born in the mathematics department. Considering the amount of logic and the emphasis on algorithms in computer science, this was a natural starting point. Today, many computer science departments are far removed from their mathematical parents. As computer algebra systems move into our mathematics curriculum, some of the parents are looking to their children for aid in teaching algorithms and logic. This discussion will explore the mathematics curriculum with an eye for where a little background in programming might help in learning mathematics, and will explore the computer science curriculum with an eye for where and how that background might be taught.
Presider: Rick Silvey, Saint Mary College, Leavenworth, KS

LUNCH

12:30 p.m. - 1:45 p.m. in Massman Hall

SESSION 5

Friday, beginning at 1:45 pm

5A. ***Using the TI-83 and TI-86 in Teaching College Algebra*** [45 min.]
Room 125 **Mingjun Yang and Joe O'Neal,**
Belton High School, Belton, MO and Raymore-Peculiar High School, Kansas City, MO
Since we have an eighty-five minute class period at high school every day, we use calculators to help students to make comparisons and contrast between different graphs after they have learned the math concepts. We use calculators to graph polynomial functions, approximate real zeros, exponential and logarithmic functions, systems of linear equations and augmented matrices, and binomial distributions. We will focus on two or three of the above topics, and give out handouts on the rest of the topics, which can be used in aiding classroom teaching.
Presider: Richard Gill, Blue Valley High School, Stilwell, KS

5B. ***WORKSHOP: Mathematical Activities Using Java*** [90 min.]
Room 203 **Joe Yanik and Chuck Pheatt, Emporia State University, Emporia, KS**
This workshop will demonstrate activities created during an NSF-funded workshop held on the Emporia State University campus in the summer of 2000. There will also be a brief demonstration of some of the tools developed for the workshop.
Courses Targeted: Calculus, College Algebra and High School Algebra.
Students' and Audience Expertise: Little
mathcsjava.emporia.edu
Presider: Carl Anderson, Johnson County Community College, Overland Park, KS

5C. ***WORKSHOP: Connect Your Students to Mathematics Through the World Wide Web*** [90 min.]
Room 205 **Julane Crabtree, Johnson County Community College, Overland Park, KS**
This interactive session will give you ideas to connect your students to mathematics through the World Wide Web. Learn how students in Basic Math, Elementary Algebra, Intermediate Algebra, College Algebra, Trigonometry, and Business Calculus use the web to further their understanding of mathematics and to interact with each other and the instructor. Sample assignments will include WebQuests, study questions, discussion questions, drill and practice, and the use of a listserve (among others). Participants will have the opportunity to begin the development of a web assignment for use in their classes.
www.jccc.net/~jcrabtre
Presider: Mike Brown, Longview Community College, Lee's Summit, MO

5D. ***Distance Delivery of Calculus Courses in Alaska Via Internet, Whiteboard, and Audio-Conferencing***
Room 302 **Ron Palcic, Johnson County Community College, Overland Park, KS** [45 min.]
This talk will focus on the presenter's experiences in teaching mathematics in a distance delivery mode in Alaska, where his students were spread out all over the state. The technology available for distance learning when he first arrived in Alaska was very primitive - just audio conferencing via an 800 number. It was obvious to him that Calculus could not be taught in this manner, but he had been asked to do so. It was important to minimize cost and not re-invent the wheel. So, the presenter began to use NetMeeting, a free product from Microsoft, in conjunction with the audio-conferencing already available. A server at the main campus of the University of Alaska - Fairbanks was used. Though primitive, the phone line provided for voice interaction between the instructor and the students. In addition to NetMeeting, the presenter will share other software - some free, some not - that he used as he taught Calculus I and II. He will discuss his unique experiences in teaching in a remote area where he never met the majority of his students face-to-face, though he could recognize their voices. He'll share joys, frustrations and glitches, time involved on his part, how these students compared with students in the traditional classroom, and other things he learned along the way as he implemented this system. http://Staff.jccc.net/rpalcic
Presider: Martha Haehl, Blue River Community College, Blue Springs, MO

5E. ***Geometric Discoveries Via the Geometer's Sketchpad*** [90 min.]
Room 306 **J. Wendell Wyatt, Northeastern State University, Tahlequah, OK**
Participants will use the *Geometer's Sketchpad* to construct polygons and circles and utilize the dynamic

feature of the software to examine geometric relationships as students would make the discoveries for the first time. Selected theorems and problems from geometry not usually found in high school texts will be constructed and verified. Some capabilities of the *GSP* will be demonstrated in the construction of the conics and animated constructions. Participants will be invited to interact and share both technical knowledge and pedagogical insights. Those who have begun to use the *GSP* should discover more of its technical features, gain new ideas for utilizing it to enhance student learning, and take home new ideas ready for use in their classroom.
Presider: David Ewing, Central Missouri State University, Warrensburg, MO

SESSION 6

Friday, 2:45 p.m. - 3:30 p.m.

6A. ***Testing Mathematical Understanding vs. Calculator Manipulation in College Algebra***
Room 125 **Laurie McManus, St. Louis Community College - Meramec, St. Louis, MO**
The ways that we assess student mastery of course material must change in response to the availability of technology. Graphing calculators are useful to enhance student learning, but the use of graphing calculators makes more "traditional" test items trivial. Students who sketch functions using a graphing calculator are demonstrating mastery of the technology but not necessarily mastery or understanding of course material. The presentation will focus on ways to change test items to elicit demonstration of mastery and understanding of course material.
Level of expertise expected of EXPO audience: some knowledge of the graphing calculator - experience teaching with the graphing calculator helpful.
Presider: Ken Eichman, Longview Community College, Lee's Summit, MO

6B. ***Combining MapleV & Reform Calculus: Attacking Group Homework***
Room 302 **Mariah Birgen, Wartburg College, Waverly, IA**
In the past, Maple V labs have followed a very traditional format: Here is an example of how to get the program to work; now use the example to work through these five problems. We have found that this process prompted the beginning of web sites such as Maple V Sucks (http://renoir.vill.edu/~gkullber/Maple_Sucks/maple.html) and others. After several years of frustration, I decided to subsume Maple V into my regular group homework assignments. The students are still working the same problems, but they are presented within the Maple V program. Hotlinks to the help sections are included where useful. The greatest advantage to the approach is that some of these problems are not appropriate for Maple V. The students not only learn the program, but also some of its limitations. The program has been in place for one year and preliminary data shows that student attitude, at least, is much improved.
Possible Courses: All levels of Calculus, Differential Equations, Mathematical Modeling.
Level of technical expertise: My students are familiar with the workings of personal computers, but have never used the Maple V program before the course begins. The EXPO audience would be expected to begin at the same level, but some comments will be addressed to those who are somewhat familiar with the program.
http://www.wartburg.edu/mcsp/birgen
Presider: Ron Palcic, Johnson County Community College, Overland Park, KS

POST - SESSIONS for KAMATYC and MOMATYC

Friday, 3:30 p.m.
Room 306 **KAMATYC - *informal meeting***
Room 302 **MOMATYC - *informal meeting***

All interested KAMATYC and MOMATYC participants will adjourn to supper, following the meetings.

SATURDAY - October 7, 2000

SESSION 7
Beginning at 9:00 a.m.

7A. ***On-Line Homework: A Preliminary Report*** [45 min.]
Room 125 **Andy Bennett and Fedor Andreev, Kansas State University, Manhattan, KS**
We have been experimenting with an automated online homework system where students receive and turn in their homework assignments over the web. Each student receives individualized assignments, and can submit assignments as many times as they wish until they receive their desired score. Assignments are graded automatically by the system. This talk will discuss our experiences with the system, during the spring and fall.
Courses Targeted: Trigonometry, College Algebra
Students' and Audience's Expertise: Ability to work a web browser
www.math.ksu.edu/~bennett
Presider: Joe Kincaid, Peru State College, Peru, NE

7B. ***WORKSHOP: Student Projects in Beginning Calculus - Try One Yourself!*** [90 min.]
Room 203 **Keith Stroyan, University of Iowa, Iowa City, IA**
With a very modest introduction to computing and the basic problem, beginning students in calculus can gain deep insight into the question: Why did we eradicate polio by vaccination, but not measles? Join me in the computer lab for 90 minutes and pretend you are 17 again and don't know calculus. I'll show you how a simple combination of the practical description of rates of change of infectious and susceptible people, together with machine computing of those rates, leads to a much clearer understanding of all the recent vaccinations of beginning college students. (Don't worry, you won't need to be re-vaccinated.) Student solution of real problems IS possible in beginning calculus. Come see how.
http://www.math.uiowa.edu/~stroyan/ctlc.html
Presider: Carl Anderson, Johnson County Community College, Overland Park, KS

7C. ***WORKSHOP: Integrating Free Web-based Tools Into the High School and College Mathematics Classroom*** [90 min.]
Room 205 **Serena Roberts, Saint Mary College, Leavenworth, KS**
This workshop will expose the participants to a variety of possibilities for integrating Web-based technology into their teaching. Beginning with a PowerPoint presentation that puts technology into the perspective of educational philosophy, epistemology, and pedagogy, participants will be encouraged to explore Web sites and a variety of free on-line tools to create products they can use in with their secondary and post-secondary mathematics classes. Some of the sites that will be highlighted are:
TrackStar (http://www.scrtec.org/track/)
Resources for use with graphing calculators (http://scrtec.org/track/tracks/s11119.html and http://scrtec.org/track/tracks/s12491.html)
Teacher Tools (http://www.4teachers.org/tools/index.shtml)
ExamBuilder (http://www.exambuilder.com/)
FlashBase (http://forms.flashbase.com/)
PuzzleMaker Math Squares (http://puzzlemaker.school.discovery.com/MathSquareForm.html)
ExplorerTM (http://explorer.scrtec.org/explorer/)
Quia! Math Activities (http://www.quia.com/math.html)

Since this workshop is dealing with strategies of effectively integrating technology into the curriculum, it is not content specific and should be applicable to any mathematics course or level taught.
http://www.smcks.edu/academics/education/roberts.htm
Presider: David Ewing, Central Missouri State University, Warrensburg, MO

7D. ***WORKSHOP: Teaching With Technology in the Developmental Math Classroom Using Prentice Hall's "Interactive Math"*** [90 min.]
Room 302 **Elaine Richards and Irene Duranzyck, Eastern Michigan University, Ypsilanti, MI**
Prentice Hall's *Interactive Math* offers comprehensive course content for developmental math, delivered on the

computer--via CD ROM and the internet. Prentice Hall's *Interactive Math* is providing better pass rates, increased retention and improved letter grades at schools nationwide. The presentation and workshop are conducted by faculty members presently using the program and they will provide participants with a first-hand account of how this program can be implemented at their own schools.

The presenters will provide an overview of the software - student tools and the course management system - while participants use laptops stationed in rows. The majority of the session will be spent with participants using the laptops to access and experience Prentice Hall's *Interactive Math*, while they interact with the presenters as they share their own classroom experiences. Handouts include: an overview of the program, the instructors' examples of how they've customized and tailored the software to their courses, information about training and support, and a program disk to take home - so participants can continue to explore the program.
Presider: Martha Haehl, Blue River Community College, Blue Springs, MO

7E. ***Using the TI-82/83 and the CBL to Enhance Mathematics Learning*** [45 min.]
Room 306 **Cynthia L. Ramey, Central Missouri State University, Warrensburg, MO**
The workshop will focus on using a CBL, motion detectors, & TI 82/83 calculators to enhance student understanding of slope and rate of change. Participants will also generate data to work through some activities to enter statistical data into the calculator and find the line of best fit for the data, as well as participate in a discussion of how to integrate the activities into their own curriculum.
www.math-cs.cmsu.edu/~dept/dept.html
Presider: Dion McNeal, Math Education Student at University of Missouri - Kansas City, Kansas City, MO

SESSION 8

Saturday, 10:00 a.m. - 10:45 a.m.

8A. ***Using Microsoft Word to Publish Mathematics on the Web*** (A Commercial Demonstration)
Room 125 **Bob Mathews, Sales Manager, K-12 Education, Design Science, Inc., Fredericksburg, TX**
Publishing mathematics on the Web is often looked at in terms of what will be available in the future. The future is now, and there are several impressive methods that can be used for publishing mathematical documents online. This session, appropriate for the high school educator and beyond, will look at tools most educators already have available, and consider how to use these tools to publish lessons, assignments, and tutorials for the Web. The presenter will be demonstrating a range of products - primarily *Microsoft Equation Editor*, *Math Type*, *WebEQ*, and *IBM Techexplorer*, with *Microsoft Word 97*.
http://www.mathtype.com
Presider: Richard Delaware, University of Missouri - Kansas City, Kansas City, MO

8B. ***Don't Settle For Doing It by Hand — ISETL For Discrete Math and Modern Algebra***
Room 306 **Joe Kincaid, Peru State College, Peru, NE**
ISETL is an Interactive SET Language whose commands and syntax are designed to mimic mathematical notation. Not only that, but it's free! This makes ISETL a natural choice for discrete mathematics and modern algebra. The speaker will introduce ISETL and relate some experiences using ISETL to teach mathematics. Level of technical expertise of students and of the EXPO audience: know how to start, and work with, a Windows program.
Presider: Libby Holmgren, Johnson County Community College, Overland Park, KS

8C. ***Using Java Applets to Demonstrate Mathematical Ideas: Combinatorics, Classical Algebra, and Calculus***
Room 123 **Keith Brandt, Rockhurst University, Kansas City, MO**
There is an abundance of websites containing applets that demonstrate certain mathematical concepts
NEW TIME interactively. These applets allow students to see algorithms and procedures in real time and better understand the mechanics behind the ideas. In one example (the "art gallery problem" from combinatorics/computational geometry), an applet reveals the nuts and bolts of a beautiful theorem and its proof. Other applets graph some well-known algebraic curves and show how the coefficients of the equation affect the shape of the curve. Also, there are several websites containing applets that demonstrate some of the fundamental concepts of calculus. Level of technical expertise expected of your students and of the EXPO audience: The ability to visit various

websites containing the applets.
Presider: Nic LaHue, Penn Valley Community College, Kansas City, MO

SESSION 9 - Invited Speaker

Saturday, 11:00 a.m. - 11:45 a.m.
Room 115

What Your Students Can Learn About the History of Mathematics on the Web

V. Frederick Rickey

United States Military Academy, West Point, NY

Recipient of the MAA Distinguished College or University Teaching Award and the MAA George Polya Award for Mathematical Exposition

The World Wide Web is a fantastic tool to enrich the resources available to teachers. There are many good sites for the history of mathematics - and we will look at some of them - but one must exercise care about the accuracy and quality of what is found. You will receive advice that will help you and your students make critical judgements.

LUNCH

11:45 a.m. - 1:00 p.m. in Massman Hall

SESSION 10

Saturday, 1:00 p.m.-1:45 p.m.

10A. ***Teaching With Technology at West Point***
Room 115 **V. Frederick Rickey, United States Military Academy, West Point, NY**
This presentation will be a discussion about how we use the calculator (HP48G up until now; TI92 in the fall) and computer (*Word*, *Excel*, *MathCad*, *Minitab*) in the classroom. This will include a discussion of projects that are designed to push the cadets' knowledge of mathematics and technology.
http**://www.dean.usma.edu/math/resource/FACULTY/rickey/rickey.htm#bio**
Presider: Carl Anderson, Johnson County Community College, Overland Park, KS

10B. ***The Perfect Marriage for Success: Web-Tools + Interactive Content + Support***
Room 125 (A Commercial Demonstration)
Ron Given, Partnership Director, Academic Systems, Kansas City, MO
Bringing courses to the web is rapidly becoming almost as important as publishing. Campus Administration seems to think that putting a course on the web is almost as easy as adding another class section. While not quite that simple, there are resources available that can make bringing a quality curriculum to the web much easier than ever before. The presentation will review the result: a Strategic Partnership of the largest web-tools producer, award-winning interactive content from Academic Systems, and unmatched training and support. The presentation will provide the background of the development and implementation of this partnership as well as a demonstration of this new generation of web-tools, now named **academic.com**. Presenter will demonstrate how ActiveContent can be easily added to a common web-tools platform. Courses Targeted: Math Fundamentals, Beginning Algebra, Intermediate Algebra, College Algebra, Business

Math, as well as review material for Statistics, Pre-Calculus, and Calculus.
Corporate Web-site: www.academic.com
Sample Website: http://mycampus.academic.com/
Presider: Rick Silvey, Saint Mary College, Leavenworth, KS

10C. ***EXPO Showcase: "Converge" Into Learning Calculus I, II, and III***
Room 203 **Mike Brown, Longview Community College, Lee's Summit, MO**
This is another in a series of sessions that are presented by members of the Math EXPO Steering Committee to showcase new technology. The purpose of this particular session is to highlight some of the unique characteristics of the *Converge* software. This software graphs mathematical functions while preparing a related table, thus allowing students to visualize a multitude of mathematical activities for themselves. The presenter will give a brief demonstration/introduction to *Converge*. Then, he will pass out a set of handouts containing Calculus I, II and III problems, with *Converge* directions. The attendees can pick and choose which handouts to work on. This hands-on exercise is designed to show off the graphical capabilities of *Converge* and to show the attendee how to use *Converge*.
Presider: Marian VanVleet, Saint Mary College, Leavenworth, KS

10D. ***Live Math: Dynamic and Interactive Mathematics for All Your Classes - Traditional and Online Maker***
Room 205 (A Commercial Demonstration)
Joan Bookbinder, Theorist Interactive, formerly of Johnson & Wales University and Elgin College
NEW This presentation will be will be a live demonstration of how math educators can effectively use a software package, LiveMath maker 3.0, to enhance the teaching and learning of mathematics. LiveMath is appropriate for Developmental through Differential Equations for two-year and four-year colleges. This program is an enhanced CAS, Computer Algebra System, which is different from the rest. LiveMath allows the instructor to set up problems and show how they are solved, step by step. They are displayed in a "notebook". Even after the notebook is saved, any value or variable can be changed and the updates are shown step by step in the notebook, dynamically. It is similar to a spreadsheet in that regard, except this is mathematics, factoring, graphing 2D and 3D, derivatives, integration, etc. The power of this teaching tool is that it allows the students to explore a mathematical scenario, draw conclusions, and learn by the discovery method.

Another important feature of LiveMath is the fact that it is live and interactive on the Internet. Any notebook can be easily embedded in an HTML document, and shared by students in a browser by way of a free plug-in. Students and colleagues can explore math live on the web. Change a value in a function and all of the mathematics updates. Graphs can be animated to explore relationships such as the effect of the coefficient a in $f(x) = a \sin(x)$. Mathematics on the web is no longer static; it is alive and exciting with almost no limitations of what can explored. From lower level to upper level undergraduate, this program challenges the way we teach and the way students learn. I have used this program in various stages of development for four years and it has vastly expanded the way my students see mathematics. Examples will be given from classes which I teach or have taught, traditionally and online.
Presider: Libby Holmgren, Johnson County Community College, Overland Park, KS

10E. ***Using the TI-83 to Teach Functions and the Inverses of Functions***
Room 306 **Richard Gill, Blue Valley High School, Stilwell, KS**
Many textbooks treat the general topic of functions as if it is somehow different from other aspects of algebra. As a result, students tend to view functions as a discrete subject when in reality functions are the basis for most mathematical modeling of real world situations. Students should be shown that simple manipulation of algebraic symbols, what they call "solving an equation," can be generalized to the writing of an inverse for a given function. With this knowledge students can use their calculator or computer to compute large amounts of data whether given the input or the outputs for the modeled situation. For this type of learning to be effective, students must be given the opportunity to experience functions and their respective inverses using
Presider: Sharon Hamsa, Longview Community College, Lee's Summit, MO

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