7th Annual Kansas City Regional
MATHEMATICS TECHNOLOGY EXPO

at the Richardson Science Center, Rockhurst College, Kansas City, MO
Friday & Saturday, October 3 and 4, 1997

We thank Rockhurst College, Johnson County Community College,
and the Kansas City Professional Development Council (KCPDC) for their support.
We also wish to thank Janice Bartels of Business Media, Inc. for the loan of a computer projection device,
Matt Heinrich, Director of Computer Services at Rockhurst, and
Damien Bowersock, Hardware/Software Specialist, for their technical support.

Schedule of Events
and Abstracts

Registration in the Lobby:
Fri., 8:00 a.m. - 2:15 p.m., and Sat., 8:00 am - 11:45 a.m.

Continental Breakfast
A complimentary continental breakfast is available Friday and Saturday.

Lunches
Friday and Saturday lunches are an all-you-can-eat buffet including 2 entrees, pizza bar, salad bar, Chinese bar, dessert and beverage. The meals will be in Massman Hall, where we will be able to eat as a group.

Technology Display Area:
Fri., 10:30 a.m. - 3:15 p.m., and Sat., 9:00 a.m. - 11:00 a.m. and 12:00 noon - 2:45 p.m.
Hands-on graphics calculator displays:
(TI-80, 82, 83, 85, 86, 92, CBL, CBR; HP 38G, 48G; Sharp EL9600; Casio CFX-9850G-Plus)
Hands-on mathematics software displays:
Converge, Derive, Derive for Windows, Freeware/Shareware (MDEP, U of AZ., NonEuclid, Wingeom, Winplot, Winstats, MPP, MPP 3D), Gyrographics, Advanced GraphsGraphsGraphs, Geometer's SketchPad
HTML Editors, Mathematica, Matlab, Microcalc, Multigraph, TeX

Textbook, Hardware, and Software Vendors:
Fri., 10:15 a.m. - 3:30p.m., and Sat., 8:00 a.m. - 1:00 p.m.
(NOTE: Most textbook vendors will not be here on Saturday, Oct. 4.)
Addison Wesley Longman; Cogito Learning Media, Inc.;Harcourt Brace; Houghton Mifflin;
International Thomson Publishing; JEMware (makers of Converge); Kansas City Audio Visual;
Mathematical Association of America (books); Prentice Hall; Texas Instruments; John Wiley & Sons; WCB McGrawHill

Welcome and Introductions
9:00 a.m. Friday in Room 115
Ken Eichman, 1997 EXPO Steering Committee Chair, Blue Springs Campus -
Metropolitan Community Colleges, Blue Springs, MO;
Matt Heinrich, Director of Computer Services at Rockhurst, Rockhurst College, Kansas City, MO

SESSION 1
Keynote Address

"Curriculum Change and Computer Algebra Systems"
Wade Ellis, Jr., West Valley College, Saratoga, CA
Second Vice President of the Mathematical Association of America
Past President of the California Mathematics Council, Community College
Member of the Mathematical Sciences Education Board
Recipient of the AMATYC Mathematics Excellence Award

The availability of software that performs algebraic manipulations will change the
mathematics curriculum in high school and college. What are the problems, opportunities and pitfalls that such
computer algebra system software present for the mathematics teaching community as we go into the 21st century?

SESSION 2
Friday, 10:30 - 11:15 a.m.

2A.
Room 203
(Mac lab)

"Introduction to Fractals, or 'Fractals for the Uninitiated and/or Confused'"
Richard Gill, Blue Valley High School, Stilwell, KS

The presenter will give simple, concise, explanations of terminology and techniques to construct and
understand classical fractals to include the Cantor set, Peano curve, Koch island and curve, Serpinski gasket,
bifurcation and the Mandelbrot and Julia sets. Participants will see how to generate fractals on the TI-83
graphing calculator. Many different types of fractals will be generated on a computer, using Fractint 19.5.
Participants with be provided with programs written for graphing calculators so that they can generate fractals
with their students, and a list of web sites useful for gaining further information and/or programs on fractals.
Presider: Donna Bullock, Central High School, KCMSD

2B.
Room 125

EXPO Showcase: **"Comparison Between the TI-85 and the TI-86"**
Libby Holmgren & Carl Anderson, Johnson County Community College, Overland Park, KS

This session is presented by members of the Math EXPO committee to showcase new technology and to
compare existing technology. This is not a keystroke oriented tutorial, though TI-86's will be provided.
Aspects of the TI-86 that are exactly the same as the TI-85 will not be covered. Instead, the purpose of this
session is to highlight some of the new and unique characteristics of the TI-86, including new aspects of
graphing, the added table capability, statistics, and more.

2C.
Room 205
(PC lab)

"Changing from Classroom to Web-Based Instruction"
Andy Bennett, Kansas State University, Manhattan, KS

This is a preliminary report on changing a major component of a mathematics class from classroom-based
instruction to web-based instruction. Elementary Differential Equations at Kansas State University has

featured computer labs for 7 years. Students have been required to come in to the department computer classroom to run the labs. In the fall of 1997, we are offering the labs over the web as Java applets. I will discuss how this has affected the course.
Presider: Ken Eichman, Metropolitan Community Colleges - Blue Springs Campus, Blue Springs, MO

2D.

"Student Projects in Ordinary Differential Equations:
      1. The Three Spring Two Mass System
      2. Chaos in Euler's Method
      3. Modeling the Opening of a Parachute "

Room 302 David John, Missouri Western State College, St. Joseph, MO   *Derive!*

- The first project investigates the motion of a three spring two mass system. Using Newton's second law of motion, we derive the differential equations needed to describe the motion of the system. Then the conditions that produce normal modes of oscillation will be determined. For an actual class, the system can be set up on an air track and the theoretical results can be verified by experimentation.
- In the second project, Euler's method is used to solve a differential equation where if one is not careful, the results lead to chaos.
- In the third project, Newton's second law of motion is used to derive the differential equations needed to model the motion of a parachutist. We look closely at the problem of when the parachute opens. This project can be simulated with a cart on an air track with a parachute.

Presider: Mike Brown, Longview Community College, Lee's Summit, MO

2E.   **"College Algebra Explorations and Applications using the TI-82 Calculator"**
Room 306 George Hurlburt & Jayashree Aiyah, Cloud County Community College, Concordia, KS

At CCCC we are developing a one-hour class called College Algebra Explorations and Applications. This course is allowing us to introduce our students to technology, and to show them "real-world" applications of algebra, without having to take time and material out of our traditional College Algebra course. We require the students to gather data, input it into the TI-82, and analyze it using the STAT PLOT and by fitting regression curves. We attempt to make the projects match with the material we are covering in lecture. For example, recently we discussed *variation* in lecture. That week in Explorations we had the students use their calculator, a CBL, motion detector, and light sensor to determine the relationship between light intensity and distance. This class is run much like a science lab, allowing the students to discover mathematics on their own or in small groups, write their results, and see the usefulness of algebra. (TI-82s will be provided.)
Presider: Joe Kincaid, Peru State College, Peru, NE

Room 206 The Technology Display Area is OPEN.

SESSION 3
Friday, 11:30 a.m. - 12:15 p.m.

These small discussion groups are organized to encourage conversation about the larger questions of teaching mathematics with technology. They are not formal presentations. A moderator will be present in each of the sessions. If you have brought items to share relating to a particular discussion topic, we encourage you to share! Any written materials generated during these discussions will be posted on our web site after the EXPO.

3A.   **"Assessment: Making the Grade"**
Room 125 Data collection and analysis, explorations, projects, group work and writing assignments all raise questions of how to set up a grading model that recognizes the importance of mathematics beyond testable skills and concepts. How can we make these types of exercises/activities count appropriately and still maintain the integrity of the grade? The moderator will share some of her own assessment models/syllabi as they have evolved and guide a discussion about alternative assessment. Participants are encouraged to share how their own syllabi reflect their grading structure.
Moderator: Martha Haehl (1991 EXPO Chair), Maple Woods Community College, Kansas City, MO

3B.
Room 203

"Math Education at a Distance: The Next Best Thing to Being There?"

The large and growing number of non-traditional students need courses delivered to where they live and work rather than at a college in another town. The explosive growth of the Internet has raised expectations that we will be able to teach these and other students at a distance using modern technology. How are we dealing with this challenge? Share your experiences, questions, excitement, and fears.

Moderators: David Ewing and Terry Goodman, Central Missouri State University, Warrensburg, MO

3C.
Room 205

"If Not College Algebra, Then What?"

What about the liberal arts students, the students not destined to go on in mathematics? Do they really need to take College Algebra? Or can we provide a different course for them? If we want something different than College Algebra, but with the same rigor as College Algebra, what should we as educators be heading towards? Can we cover topics not normally covered in College Algebra? Can we better prepare these students for careers in government, or business? Bring your questions, concerns, and ideas!

Moderator: Nic LaHue, Penn Valley Community College, Kansas City, MO

3D.
Room 302

"Testing the Student, Not the Calculator: Writing Classroom Tests"

Now that graphing calculators have become an essential tool in many mathematics classes, both in high schools and colleges, we instructors have all had to develop the skill of writing timed classroom tests that acknowledge the fact that graphing devices are available. So, we ask: If graphing calculators, or even graphing software, can be used during a timed classroom test, what sorts of new questions can be added, and what old ones should be abandoned, in order to test the student's mathematical knowledge, NOT just their technical calculator expertise? The moderators for this talk will provide a few good examples of such tests, from a variety of courses, and hope to generate discussion about the nuts and bolts of creating them for your own mathematics classes.

Moderators: Marian VanVleet, Saint Mary College, Leavenworth, KS, and Joe Kincaid, Peru State College, Peru, NE

3E.
Room 306

"Algebra Topics: What Do We Throw? What Do We Keep?"

College Algebra and courses similar to it, whether in high school or college, have been passing through changes over the last few years, and many of us wonder what form it should take in the next Century (assuming it still exists at all). This discussion addresses the specific question: What mathematics topics should the course consist of? Some provocative discussion questions might be:

-Is it too hard on unsophisticated students to begin the course discussing the abstract structure of the Real Numbers? Should this appear later?

-In the study of polynomial equations and their roots, should we dump Synthetic Division, Descartes Rule of Signs, and the Rational Zeros Theorem; and instead, present a theorem which determines an interval containing ALL zeros, rational or not; and then use a graphing device to approximate?

-Do conics, matrices, or probability belong in the course, or are these sections just present in a sort of encyclopedic tyranny of textbook publishers?

Bring your ideas and your arguments.

Moderators: Richard Delaware, University of Missouri - Kansas City, Kansas City, MO, and Donna Bullock, Central High School, Kansas City Missouri School District

Room 206   The Technology Display Area is OPEN.

LUNCH
Massman Hall
12:15 p.m. - 1:30 p.m.

Room 206   The Technology Display Area is OPEN, though food is not allowed in the room.

4A.   **"Does Computer Practice Improve Developmental Math Skills?"**   (45 min.)
Room 125   Cheryl Winter & Martha Eagle, Blue Springs/Independence Campuses of Metropolitan Community Colleges

A classroom research project funded by a district Funding For Results(FAR) proposal, this project focuses on the use of computers as a supplemental aid in the classroom. The talk will compare the use of computers versus traditional methods of delivery, students' attitudes concerning the use of computers, and final results. *Presider*: Donna Bullock, Central High School, Kansas City Missouri School District

4B.   **WORKSHOP: "Using TeX to Produce High Quality Math Documents"**   (90 min.)
Room 203   John Koelzer, Anita Salem & Paula Shorter, Rockhurst College, Kansas City, MO
(Mac lab)

- TeX is a powerful, versatile, programmable typesetting language created by Stanford University's Donald Knuth. **TeX** is designed to automatically reproduce the quality of fine hand-set type and it is especially good for typesetting complex mathematical and scientific expressions.
- This workshop will teach the participants about this mathematical typesetting system, and how it can be used to produce high-quality tests and other materials for mathematics classes.
- Information will be given to participants about obtaining <u>free</u> versions of **TeX** for **both Macintosh and PC computer systems.**

4C.   *EXPO Showcase*: **"Useful Mathematics Freeware/Shareware"**   (45 min.)
Room 205   Richard Delaware, University of Missouri - Kansas City, MO, and Joe Kincaid, Peru State College, Peru, NE
(PC lab)

Many small pieces of mathematics software exist and are easily downloaded off Internet sites if you know where to find them. Some are free, some allow you to try them, then ask for payment, and some require payment first. All are fairly cheap. We will guide you to a few of these sources, providing a handout with web addresses and the like, and also showcase several of the programs we've found, such as:
- Sections from the University of Arizona set of free programs
- NonEuclid, shareware for exploring non-Euclidean geometries
- MPP, MPP3D, MDEP free programs for graphing, and differential equations
- Free miscellaneous software from Phillips Exeter Academy, and More.

If you want some cheap, special-purpose, easy to use programs, which you can easily download off the Internet, this showcase, presented by members of the EXPO committee, is for you.

4D.   **"Math Education Research: Results and Implementation"**   (45 min.)
Room 302   Kim Christensen, Penn Valley Community College, Kansas City, MO

Research is being done on how college students learn mathematics. Instead of just lecture, more math instructors are also using cooperative learning, activities, computer software, and graphing calculators in their classes so students can spend time doing things and then also think about what they have done. The presenter plans to discuss what research has been done recently in college mathematics education, and what results have been found. Then she plans to show some algebra and calculus activities she has done in her classes (where she used the math computer lab and Derive at Penn Valley.)
Presider: David Ewing, Central Missouri State University, Warrensburg, MO

4E.   **"How Does the TI-82 Do Numerical Integration?"**   (45 min.)
Room 306   Cathleen O'Neil, Johnson County Community College, Overland Park, KS

The Gauss-Kronrod numerical integration technique is widely used since the advent of inexpensive hand-held calculators. It is faster and more accurate in most cases than Simpson's Rule, yet still provides a measure of error for the answer.
Presider: Andy Bennett, Kansas State University, Manhattan, KS

Room 206   The Technology Display Area is OPEN.

SESSION 5
Friday, 2:30 p.m. - 3:15 p.m.

5A.   **"Internet Activities for Consumer Math"**
Room 125   Patti Blanton & Terri Chasteen, Nixa High School, Nixa, MO

Many consumers today are plugging into the electronic world of personal finance. Students have an opportunity to try some of these activities in the real-world simulation of Consumer Mathematics. Activities include: contacting major corporations, shopping for large consumer items at major national chains, electronic banking and shopping for a new car on the internet.
Presider: Martha Haehl, Maple Woods Community College, Kansas City, MO

5B.   *EXPO Showcase*: **"Web Pages for Dummies"**
Room 205   Andy Bennett, Kansas State University, Manhattan, KS, and Joe Kincaid, Peru State College, Peru, NE
(PC lab)

Many packages are available to let you generate web pages without writing HTML code. This showcase by members of the EXPO committee will look at the strengths and weaknesses of several such packages, including Microsoft Front Page and HoTMetaL.

5C.   **"Comparison of Traditional vs. Tech-based Intermediate Algebra"**
Room 302   Angela Grant, Lincoln University, Jefferson City, MO

During both the fall semester of 1996 and spring semester of 1997 I taught two sections of Intermediate Algebra. One section was taught using Martin-Gay's traditional textbook, with lectures and lots of repetitive homework problems. The other section was taught using an innovative text by Kysh, Sallee, Kasimatis, and Hoey called *Intermediate Algebra: Models, Functions, and Graphs.* In the latter section there were group activities, writing assignments, and required use of TI-82 graphing calculators. I plan to compare the sections using data collected both semesters as well as qualitative analysis of the two teaching modes.
Presider: Ken Eichman, Blue Springs Campus - Metropolitan Community Colleges, Blue Springs, MO

5D.   **"Numerical Methods on the TI-85"**
Room 306   Daniel Willis, Loras College, Dubuque, IA

The speaker will discuss the implementation of standard numerical algorithms (e.g., root-finding, interpolation, and numerical integration) on the TI-85 graphing calculator. He will discuss methods that are hard-wired already in ROM (such as POLY and FNINT), as well as methods (such as the Trapezoidal rule and Simpson's rule) that require some programming.
Presider: Marian VanVleet, Saint Mary College, Leavenworth, KS

Room 206   The Technology Display Area is OPEN.

Post - SESSION
Friday, 3:30 p.m.

Room 302   MOMATYC (Missouri Mathematical Association of Two-Year Colleges) will have an informal meeting and may adjourn to supper.

Room 306   KAMATYC (Kansas Mathematical Association of Two-Year Colleges) will have an informal meeting and may adjourn to supper.

SESSION 6
Saturday, Starting at 9:00 a.m.

6A.
Room 203
(Mac lab)

WORKSHOP: "Experiences with 'Geometer's SketchPad' in High School Geometry" (90 min.)
Marianne Petru, Cathy Hessler & Pam Pedersen, St. Joseph's Academy, St. Louis, MO

Three geometry teachers from a private high school in St. Louis reflect upon their first year (1996-1997) using the soft ⌐————? ,
writing lesson instructions, effectiveness and frequency of usage, and results of a student survey will be discussed. Both demonstrations and hands-on activities will be included. Macintosh experience is suggested.
Presider: Donna Bullock, Central High School, Kansas City Missouri School District

6B.
Room 302

"Creating Authentic Interdisciplinary Projects for Calculus" (45 min.)
Anita Salem, John Koelzer, & Paula Shorter, Rockhurst College, Kansas City, MO

Rockhurst College recently received an NSF - Course and Curriculum Development grant to create interdisciplinary science projects for the three semester calculus sequence. The focus of their work is on the creation of well-defined projects which are more authentically connected (through introductory reading and carefully sequenced analytical activities) to their scientific disciplines. Additionally, projects emphasize the collection as well as the analysis of data using modern technologies such as computer algebra systems, universal lab interfaces and the Internet. Of significance in the project development phase is the participation by members of an Interdisciplinary Science Council (ISC). The panel, consisting of the Co-Principle Investigators and members of the ISC, will discuss the process by which projects are identified and developed.

6C.
Room 306

EXPO Showcase: **"Comparison between the new Sharp EL-9600 and the TI-83"** (45 min.)
Richard Delaware, University of Missouri - KC, Kansas City, MO, and
Carl Anderson, Johnson County Community College, Overland Park, KS

This is another in a series of sessions presented by members of the Math EXPO planning committee to showcase new technology and to compare it with existing technology. This is not a keystroke-oriented tutorial. Aspects which are identical in the two calculators compared will not be covered. The SHARP EL-9600 graphing calculator, replacing the now discontinued EL9300C model, has just been released this month, and is a worthy competitor for the TI-83. Some fresh or unusual SHARP features are:
    -Touch-screen pen-entry option (no other calculator has this)
    -Rapid-Graph and Rapid Window features
    -Connects to the TI CBL and CBR devices
    -Slide Show, and Split Screen capabilities
    -Tables, & financial functions(similar to the TI-83)
    -Direct entry of a/b and a^b expressions as you would write them (no other calculator has this) *except the HP 48G/6X*

6D.
Room 315

WORKSHOP: "Using Simulation in Statistics with the TI-83" (90 min.)
Mike Koehler, Blue Valley North High School, Overland Park, KS

The TI-83 graphics calculator is a powerful tool in the teaching and learning of statistics. Participants will get hands-on experience with the statistics functionality of the calculator in using simulations to deepen the understanding of statistics for their students. The topics are covered in the Advanced Placement Course Description for statistics, which makes them appropriate for both high school and college teachers of statistics. TI-83 calculators will be provided.
Presider: Kay Weiss, (1992 EXPO Chair), Oklahoma University, Norman, OK

Room 206   The Technology Display Area is OPEN.

7A.   **"Factoring is a Cultural Thing: U.S. vs. Germany"**
Room 302   Claudinna Rowley, Johnson County Community College, Overland Park, KS
Claudinna Rowley spent the 1995-1996 school year in Germany in the Fulbright Exchange Program. She taught 11th grade mathematics in a college preparatory high school, where she was very surprised to learn that the Germans do not teach factoring. This, of course, raises many questions such as: What do the Germans do if they don't factor? Do they use more technology to skip the concept that the Americans find sooooo important? What would happen if the Americans took factoring out of the curriculum? Would our system collapse? What would happen to the math section of those extreeeeemely important American Standardized tests such as the ACT, SAT, GRE or the GMAT? Would our system improve? What could the Americans do otherwise if we took factoring out of the curriculum? Who decided Americans needed to factor in the first place? Who really likes to factor and teach factoring anyway? Don't we have better things to do? These and many more questions will be raised during this discussion.
Presider: Joe Kincaid, Peru State College, Peru, NE

7B.   **"Calculus in High School and College in a New Century"**
Room 306   Wade Ellis, Jr., West Valley College, Saratoga, CA
The use of computer algebra systems will allow the current set of curriculum topics for calculus to be covered in less time in high school and college. What new material should be introduced as we revise our curriculum? Should we cover the current topics in greater depth? Does the technology allow us to cover important topics that were inaccessible with paper and pencil methods?
Presider: Libby Holmgren, Johnson County Community College, Overland Park, KS

Room 206   The Technology Display Area is OPEN.

"Chaos Games and Fractal Images"
Bob Devaney, Boston University
Recipient of the 1996 Boston University Scholar/Teacher of the Year Award
Recipient of the Award for Distinguished University Teaching from the Northeastern section of the MAA
Co-director of the National Science Foundation's Dynamical Systems and Technology Project
Boston University Ordinary Differential Equations Project

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

Room 206   The Technology Display Area is OPEN during lunch, though food is not allowed in the room.

9A.
Room 115

"The Fractal Geometry of the Mandelbrot Set"
Bob Devaney, Boston University, Boston, MA

(45 min.)

In this talk we describe via a combination of computer experiments, slides, videos, and geometric techniques the beautiful mathematics that lies behind the Mandelbrot set. While many people have seen the intricate and beautiful patterns that form the boundary of this set, few realize that each of these patterns has its own specific mathematical meaning and that mathematicians can understand this complexity in full detail. We will also discuss how some of these ideas can be made accessible to students whose background includes only complex arithmetic.
Presider: Andy Bennett, Kansas State University, Manhattan, KS

9B.
Room 203
(Mac lab)

WORKSHOP: "Geometrical Foundations of the Graphs of Trig Functions"
Richard Gill, Blue Valley High School, Stilwell, KS

(90 min.)

Participants will generate graphs of all six trig functions using the Geometer's SketchPad. Included will be a discussion/demonstration of how to show the relation between radian and angle measure on the unit circle. Major emphasis will be on the geometrical concepts behind the generation of the graphs of the six trig functions. Participants will also see how to use SketchPad to derive graphs algebraically.
Presider: Joe Kincaid, Peru State College, Peru, NE

9C.
Room 205
(PC lab)

WORKSHOP: "Using Derive for Windows"
Ken Eichman, Blue Springs Campus - Metropolitan Community Colleges, Blue Springs, MO

(90 min.)

- This workshop is for the uninitiated, for those who want to know what Derive can do or how to get started with it. The majority of the time will be used by the participants to work through a handout which walks them through the following topics: entering expressions, evaluating expressions and modifying expressions by substitution, factoring polynomials, solving algebraic and trigonometric equations, defining and evaluating functions, defining and row-reduction of matrices, graphing functions, plotting points, simple curve fitting, graphing piece-wise continuous functions, and graphing parametric equations, derivatives, implicit differentiation, limits, definite and indefinite integrals, and 3-D graphing.
- Anyone familiar with the classic (DOS) version of Derive is also welcome to come to experiment with the Windows version.
Presider: Mike Brown, Longview Community College, Lee's Summit, MO

9D.
Room 302

"Calculus/Physics Alignment - A Report in Progress"

(90 min.)

Bob Hunt & Carl Anderson, Johnson County Community College, Overland Park, KS;
Perry Doyle, Cheryl Lewkowsky, & Martha Haehl, Maple Woods Community College, Kansas City, MO

The presenters from two schools, Johnson County Community College and Maple Woods Community College, will briefly discuss what has been done and learned to date in their efforts at aligning Physics I with Calculus II, and Physics II with Calculus III at their institutions. The presenters will share what has been successful as well as places where alignment does not seem to work.

9E.
Room 306

"Student Research Projects: Integrating Mathematics, Technology and Communication Skills"
Donna Stallings & LaShonda Boone, Lincoln University, Jefferson City, MO

(45 min.)

The survey project requires students to analyze and present information that they have obtained from a semi-research project. Students choose a topic, complete background research (using library resources), survey a sample of people, present data (computer graphing or graphing calculator skills used) in graphical form, analyze and present it before their peers. This project allows students to use a variety of mathematical and analytical skills. It pulls in writing and allows students to practice presenting a paper and defending it before their peers. Students also learn how statistics can be skewed due to problems in collecting or interpreting

data.
Presider: Donna Bullock, Central High School, Kansas City Missouri School District

Room 206   The Technology Display Area is OPEN.

1997 MATHEMATICS TECHNOLOGY EXPO

1997 Steering Committee
Ken Eichman, 1997 Chair
Blue Springs Campus - Metropolitan Community Colleges

Carl Anderson
Johnson County Community College, Overland Park, KS

David Ewing
Central Missouri State University, Warrensburg, MO

Andy Bennett
Kansas State University, Manhattan, KS

Libby Holmgren (1995 & 1996 Chair)
Johnson County Community College, Overland Park, KS

Mike Brown
Longview Community College (MCC), Lee's Summit, MO

Joe Kincaid
Peru State College, Peru, NE

Donna Bullock
Central High School, KCMSD

John Koelzer
Rockhurst College, Kansas City, MO

Tim Chappell
Penn Valley Community College, Kansas City, MO

Nic LaHue
Penn Valley Community College, Kansas City, MO

Richard Delaware (1993 & 1994 Chair)
University of Missouri, Kansas City, Kansas City, MO

Marian VanVleet
Saint Mary College, Leavenworth, KS

The 1997 Mathematics Technology Steering Committee hopes that you found the EXPO informative and enjoyable. Please be sure to turn in any evaluation forms. See you next year!

Visit our Math EXPO web site: http://www-personal.ksu.edu/~bennett/expo.html