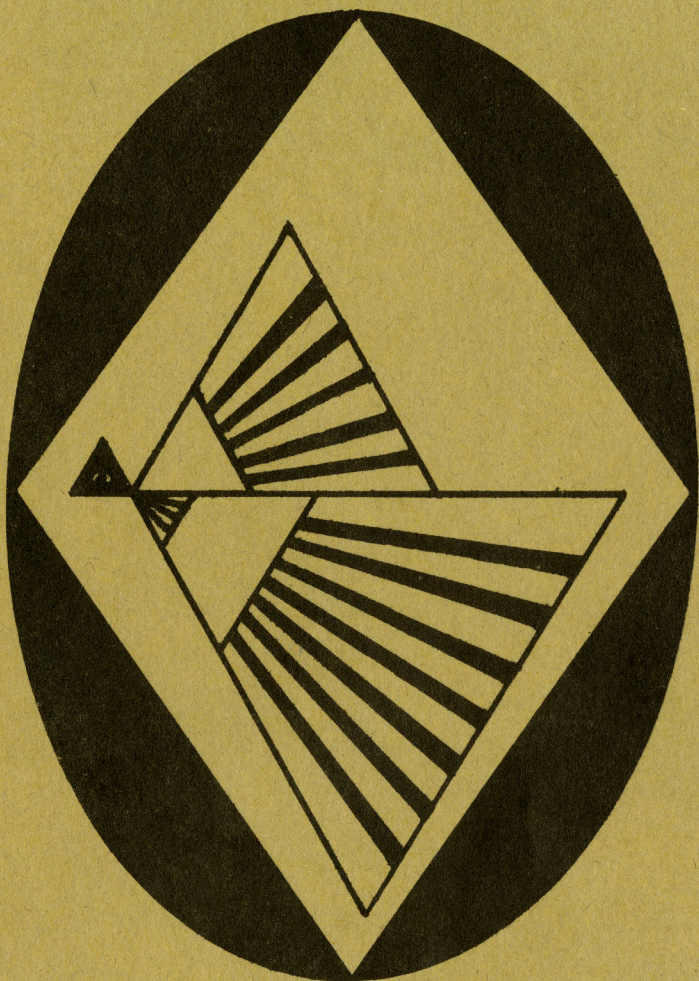
MATH NEWSLETTER

Number 1, Fall 1978



GUESS THE SEQUENCE

CALIFORNIA POLYTECHNIC STATE UNIVERSITY
SAN LUIS OBISPO, CALIFORNIA 93407

LETTER FROM THE EDITOR

Well, here it is--the very first issue of what we hope will be an annual Mathematics Department newsletter.

It has been many months since our Department Head, Dr. Charles Hanks, conceived the idea of a newsletter for our department and charged Dr. Boyd Judd and me with the responsibility of making that idea a reality. Our task seemed formidable when we first accepted it. How could we possibly round up enough material to produce an interesting and informative newsletter?

Well, our task has been a formidable one, but not because of a lack of topics to write about. Indeed, the contributions we have received have kept Dr. Judd and me at the drawing board. So we would like to extend our sincere appreciation to all faculty members, students, and alumni who contributed information for this news bulletin. A very special note of praise and gratitude is in order for Dr. Judd, for without his commendable efforts and dedicated persistence, this newsletter would never have materialized.

We hope you will enjoy browsing through the articles we have compiled here for you. Do let us hear your thoughts and suggestions. And you alumni, keep in touch!

Sincerely yours,

Charles Pasquini

Charles Pasquini
Editor

LETTER FROM THE ADVISOR

This is our very first attempt at a departmental newsletter intended primarily for alumni--so we hope the anticipated critical remarks will be tempered somewhat by this fact. I believe that Charles Pasquini, your editor, deserves much praise for his efforts. He was already very busy working toward his Master's Degree at the time we saddled him with this duty. But Charles, in his usual affable manner, accepted the job of editor without a murmur, even under his breath.

Incidentally, with the passage of Proposition 13, we didn't know for sure until about last October that we could even have such a publication--so, again I say, please bear with us at this, our first, effort.

W. Boyd Judd

W. Boyd Judd
Mathematics Department

EXPLANATION OF COVER DESIGN

The lengths of the sides of the triangles form the sequence 1,1,2,3,5,8, which is a Fibonacci sequence. Separately the perimeters of those triangles can form a Fibonacci sequence if the smallest triangle is assumed to have a perimeter of one unit.

Sabah Al-hadad
Mathematics Department

LETTER FROM THE DEPARTMENT HEAD

Dear Alumnus:

This is the first of what we hope to be an annual newsletter for our Mathematics alumni. The material in the newsletter consists primarily of news and events that have occurred in the past year. Hence I have been asked by the editor to highlight some of the events that have occurred in the past twenty-five years.

Surely not a highlight, but I arrived on the campus in the Fall of 1954. There were approximately four thousand male students enrolled at that time and we had thirteen faculty members in the Mathematics Department. The math offices were housed in Army surplus quonset huts located in the area where the Engineering West building now stands. With the retirement of Professor Chester Scott at the end of Fall Quarter 1978, Dr. George Mach and I are the only remaining members of that group still teaching in the department.

In the Fall Quarter of 1956, women were again admitted to the campus. Though Cal Poly was originally coeducational, it ceased to admit women students commencing Fall of 1929. At present, more than 6,000 of the 15,600 students enrolled on our campus are women. In 1959 we moved into our present quarters called the Mathematics and Home Economics Building. In addition to housing the Home Economics Department, this building contains faculty offices for 50 faculty members in this department, and 15 classrooms in which we teach the majority of our math classes.

In 1967-68 the Mathematics Department commenced offering Master's Degrees: a Master of Arts Degree with emphasis in teaching, and a Master of Science Degree with emphasis in Applied Science. The first individual to receive a Master's Degree in mathematics was Ms. Joyce Curry in the Summer of 1968. More than 100 students have received Master's Degrees in the past ten years in one of these programs. In 1975 these two degree programs were merged, and we are presently offering a Master of Science Degree in mathematics with specialization in either teaching or applied mathematics.

By 1968-69 the math faculty had increased to approximately sixty full-time teachers. The Math Department was split, and a Department of Computer Science and Statistics was formed with twelve members of the Mathematics Department forming the teaching nucleus of the new department.

Dr. Milo Whitson, who had provided outstanding leadership to the department and university for more than 25 years, retired in 1972, and I became department head. At present we have 48 full-time teaching positions in mathematics with a clerical staff of four secretaries. We have approximately 250 undergraduate majors in mathematics. At the undergraduate level we offer the B.S. Degree in mathematics with options in applied math, finite math, and mathematics teaching. However, we remain primarily a service department providing the math courses needed in all other curricula on the campus for developing vocational and professional proficiency and for general education.

Although we continue to be interested in the success of all Cal Poly graduates, you, our majors, are special to us and we hope by means of this newsletter to accomplish two objectives. First, to keep you informed annually of events that occur in the Math Department here at the university; and second, that perhaps you in return will provide us with feedback, not only of what you are doing, but also of the extent to which our math programs here have met your needs since graduation. By the latter, you may help us to improve our program so that it will better prepare our present students to be successful when they graduate.

Sincerely,

Charles J. Hanks

Charles J. Hanks, Head
Mathematics Department

FACULTY NOTES

Dr. Sabah Al-hadad and Professor Chester H. Scott have completed the writing of a new textbook. Entitled College Algebra with Applications, the text is to be published by Winthrop Publishers in November, 1978. It is intended for use in a pre-calculus algebra course such as Math 118 at Cal Poly. Among the distinctive features of the text are a unique structured analytical technique for solving word problems and more applications than any competing text. A second text authored by Al-hadad and Scott is Algebra for College Students. This text, written at the intermediate algebra level, is in its final reviews with Prentice-Hall Publishers. Incidentally, Dr. Al-hadad is the author of the text Topics for Agricultural Mathematics, second edition, which has been used successfully in Math 103 since 1976.

Dr. Alfred M. Bachman spoke to a group of 300 senior high school mathematics teachers at a sectional meeting of the 56th annual meeting of the National Council of Teachers of Mathematics. The meeting was held at the San Diego Convention Center, April 12-15, 1978. Dr. Bachman's talk, entitled "How to Raise Student Achievement in Mathematics Classes", received many favorable comments from the audience.

Dr. Estelle Basor will be on leave during the winter and spring quarters of 1979. She will be at Utah State in Logan, Utah, where her husband Kent Morrison has been serving as an assistant professor of mathematics since September 20, 1978. Estelle plans to continue her research in operator theory and classical analysis, specifically in the area of Toeplitz operators. She also plans to attend some of the colloquia and seminars at the University of Utah in Salt Lake City.

Associate Professor Jack Girolo, his wife Jeanne and daughter Claire had the good fortune to spend the 1977-78 academic year on sabbatical leave in Montreal. Jack was a visiting member of the Mathematics Research Center at the University of Montreal. Jack said that life there was very pleasant; however, after six months of snow they have a greater appreciation for sunny California.

Dr. and Mrs. Tom Haskell and son Ben enjoyed a 5-week trip to Europe this past summer. Tom's oldest son, also named Tom, lives in Frankfurt, Germany with his wife, a captain in the U.S. Army Auxiliary - and hence was able to join other members of the family in touring parts of Germany, Austria and Italy. Later in the summer, Tom and his wife and Ben enjoyed a stay at the chalet of a friend in Grindlewald, Switzerland.

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Mark Holzman, Res. Engr., Western Geophysical Company, invites you to find three consecutive integers such that, when all possible simple fractions are formed therefrom, the sum of the six different fractions will be an integer.

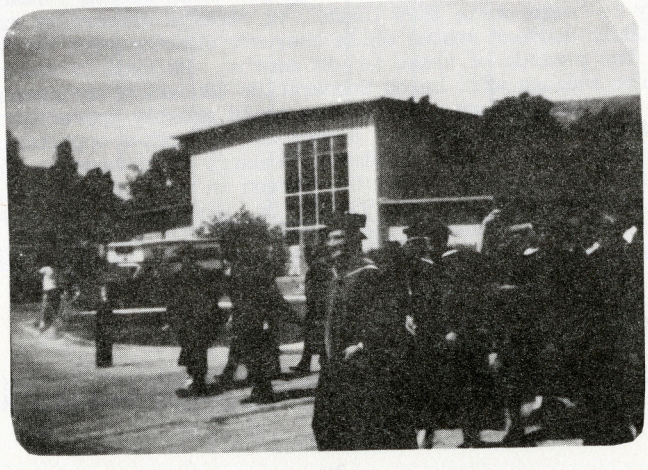
???

Dr. Martin T. Lang has collected a number of graphics programs written for the Tektronix 4051 Graphics Computer and has made them available to other instructors in the department for classroom use. Some of the available programs are: graphs of functions in polar coordinates, Fourier and Maclaurin series approximations of selected functions, the least squares regression line, and Euler's solution to first order differential equations.

Dr. George Lewis took a two-quarter sabbatical leave Fall 1977 and Winter 1978 to study physics at U.C. Santa Barbara. He is interested in the relation between theoretical physics and mathematics; for example, quantum mechanics and operator theory, relativity and differential geometry. George said he found that pure mathematics is used in physics to a degree he had not heretofore appreciated. But there is a problem. Says George, "I am fascinated by the difficulty that physicists and mathematicians have in communicating with each other and consider this to be a serious problem."

Dr. Allen Miller represented mathematics on the team of Cal Poly faculty members who collaborated in presenting lectures on problem solving and thought processes in the various academic disciplines for Humanities 341X. The course, titled Creative Ideation, was offered in spring quarter 1978.

Dr. Dina Ng spent much of the summer of 1978 visiting her parents and family in Cebu City, Philippines. In visiting her high school alma mater she found some of her teachers still in the classroom, but now teaching Dina's nieces and nephews. Dina remarked on how hard children in the Philippine high schools must work: they attend classes 5½ days a week with 5 days running from 7:30 a.m. to 5:00 p.m., and still have a couple of hours of homework to do each evening. Dina also spent some time at the University of San Carlos where she attended college. In talking with faculty there she found the situation very similar to ours: teachers concerned about their work load and lack of adequate compensation. Dina said that after enjoying the mild climate of the central coast of California, she found it difficult to accept the heat and humidity of the tropics again.



Chester H. Scott, Professor of Mathematics, has announced his plans for retirement effective December 31, 1978. He has been a member of the Cal Poly Mathematics Faculty since September, 1952. Scott, who was 63 years old on March 31, said that he has been planning on retirement for three or four years. He says that it is just as important to plan for retirement as it is to plan to teach any course. Chet, as most of his friends address him, plans to concentrate on two kinds of activities: (1) continue his textbook writing in mathematics, and (2) work in his multipurpose shop. If he can convince his wife, Esther Mabel, he would also like to do some traveling. As a participant in the State Early Retirement Program, Scott will retain close contact with the University by teaching one quarter annually for the next three years. He also wishes to keep in touch with former students of his. He and Mrs. Scott will continue to reside at 351 Buena Vista Ave., San Luis Obispo, CA 93401.

Dr. H. Bernard Strickmeier left the ranks of bachelorhood September 9, 1978 by marrying Stephanie Ann Hoff of Rochester, Minnesota. Dr. and Mrs. Howard Steinberg served as best man and matron of honor, respectively. Incidentally, Mrs. Steinberg is the sister of the bride.

Dr. Neal Townsend has authored a book designed for introductory probability and statistics courses at the high school and community college levels. The text, Developing Skills in Statistics, is co-authored with Grayson H. Wheatley of Purdue University, and is published by Allyn and Bacon, Boston, (1978 copyright). Dr. Townsend spoke on May 21, 1978, to seventh and eighth grade math classes at Vandenberg Junior High School in Lompoc on the math requirements in high school and college for various occupational careers. This talk originated as the result of a letter and brochures which were sent by the Cal Poly Mathematics Department to all junior and senior high schools in our area. The two brochures, recently published jointly by M.A.A. (Mathematical Association of America) and N.C.T.M. (National Council of Teachers of Mathematics), are The Math in High School You'll Need for College, and Recommendations for the Preparation of High School Students for College Mathematics Courses.

Dr. Ralph M. Warten has been active in getting our math majors interested in Cal Poly's Cooperative Education Program, which offers students the opportunity to "earn while they learn", to receive university credit, and to retain their student status while they are working with industries or government for periods of three to six months. He expects about 10 math majors on the average will be on Cooperative Education assignment each quarter in the near future. Dr. Warten would greatly appreciate any helpful information from Cal Poly alumni about further opportunities for placement of our math majors in either industry or government work under this program. Alumni may contact Dr. Warten in care of the Mathematics Department, San Luis Obispo, CA 93407. Dr. Warten will be on sabbatical leave during the winter and spring quarters of 1979 in order to join the numerical analysis group at Stanford University as a Visiting Scholar.

"Old mathematicians never die ... they just approach their limit."

Dr. Stephen T. Weinstein spent the 1977-78 academic year as a Visiting Research Fellow at Harvard. Aside from his own work on factorization of operators, he attended the Operator Theory seminar down the street at M.I.T. and sat in on some courses in the History of Science Department at Harvard. Steve says: "Harvard is an extremely stimulating, high-pressure, intellectual environment. In the Math Department, even the casual coffee-break conversations are about mathematics. Everyone seems to work very hard almost all the time. While I was there at least ten world-famous mathematicians from other places gave colloquia. One of the most impressive things about Harvard is its library system, probably one of the best in the world. I often went to the main library, intending to spend an hour or so, and stayed all day. There is a separate library for rare books, original manuscripts, etc. This includes, for example, a copy of Robert of Chester's translation of the famous algebra ("Al-jabr") text of Al-Khwarizmi. The winter of '78 in Boston brought the record blizzard and I got pretty good at shoveling snow. But many a confirmed New Englander thinks that Californians are crazy to live in a place that has earthquakes. (Maybe they are right!) Crazy or not, it is good to be back, although every now and then I find myself already thinking about my next leave or sabbatical."

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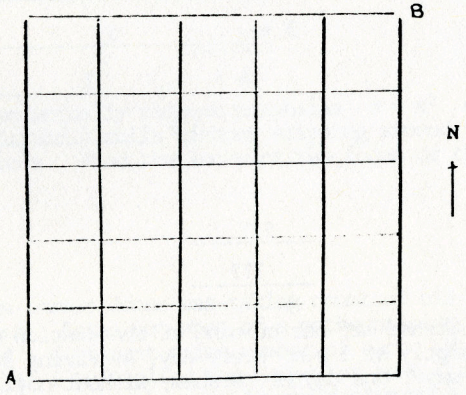
Here is a map of the roads from A to B. Every segment is a road. Starting at the same time, if John walks from A to B, and Jim walks from B to A at the same speed, what is the probability that they meet? Each boy always walks toward his destination, i.e., going from A to B, John always moves S to N or W to E.



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Why must a house whose rooms each have an even number of doors likewise have an even number of outside entrance doors?

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Distinguished Professor

Dr. Ralph Warten, member of the Mathematics Department since 1968, was named one of the three professors on campus distinguished for excellence in teaching during 1977-78. Dr. Warten was honored at the Faculty-Staff Annual Conference in Chumash Auditorium on September 19, 1977.

Congratulations, Dr. Warten, on a well-deserved honor!

Mathematics Department Promotions

A number of members of the Mathematics Department faculty and staff have enjoyed promotions the past year. Effective September 1, 1978, Martin T. Lang, Stephen T. Weinstein, and Patrick O. Wheatley were promoted to the academic rank of Professor. Promoted to the rank of Associate Professor were H. Arthur DeKleine, Adelaide T. Harmon-Elliott, Alan W. Holz, Euel W. Kennedy, and Raymond D. Terry.

In November, 1977, our department secretary Peggy Young was promoted from department secretary rank II-B to rank III-B.

Our warmest congratulations and deep appreciation are extended to these wonderful people!

$$\text{Find } x \text{ if } x = -2 + \cfrac{1}{3 + \cfrac{1}{4 + \cfrac{1}{3 + \cfrac{1}{4 + \cfrac{1}{3 + \cfrac{1}{\ddots}}}}}} = \; ???$$

Mrs. Suburban Graham met her husband at the station with the family car promptly at 5 p.m. every day, averaging 30 miles per hour each way. One day Mr. Graham, without notifying her, caught an earlier train which arrived at 4 p.m. and started walking home. Mrs. Graham picked him up part way and they got home fifteen minutes earlier than usual. How fast did he walk?

???

New Faculty

J. Myron Hood

Born and Raised in Montana. B.A. from Grinnell College in Iowa, M.S. from Northwestern University in Illinois, Ph.D. from Washington University in Missouri. Taught for six years at Occidental College in Los Angeles. Spent one year at CalTech as a research associate in biomathematics. Came to Cal Poly in Fall 1977. Interests are teaching, biomathematics, mathematical modeling and number theory. Recent publications have been work done in collaboration with biologists in several different areas including marine biology, immunology and biochemistry. Married, has two sons, lives in Los Osos. Avocations include jogging, hiking, camping and trying to live within his income.

George W. Luna

Received his Ph.D. from the University of Washington in 1973. His dissertation was directed by R. R. Phelps and done in nonlinear functional analysis. He has a perfect number of publications in various fields: convex analysis, complementarity problems and approximation theory. He has taught at UCSD, Cal Poly Pomona, and Fort Lewis College. In 1975 he spent the summer at the Space Environment Laboratory in Boulder, Colorado.

Stephen V. Noltie

Lived in Canton, Ohio prior to coming to California for graduate school. He graduated in 1967 with a B.S. degree in mathematics from Case Western Reserve University. He obtained his Ph.D. in mathematics from U.C. Riverside in 1976. His graduate school was interrupted by 3 years of service in the U.S. Army in West Germany and the U.S. At U.C. Riverside he studied under M. M. Rao and did his dissertation in the area of Geometric Measure Theory.

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Consider two mutually tangent parabolas $y = x^2$ and $y = -x^2$. The upper parabola rolls without slipping around the fixed lower parabola. Find the locus of the focus of the moving parabola.

???

A gentleman farmer Jones was taking count of his horses, cows and chickens. Being somewhat of a mathematician, he noticed that he had a different prime number of each. Moreover, he observed, "If I multiplied the number of cows I have by my sum total of cows and horses, it would give me a figure just 120 greater than my number of chickens." How many of each must he have had?

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MATHEMATICS DEPARTMENT
FACULTY AND STAFF
SPRING 1978

Martin Van Eps Scott Hale McBeth Townsend
Wheatley Epstein Strickmeier Delany Laumann Lowry
DeKleine Steinberg O'Neil Johnson Hanks
Haskell Holz Murphy Hood Langford Warten
Huehn Seaman Basor Lang McDill
Harmon-Elliott Al-hadad Goldenberg Luna Miller
Mach Tao Ng Milliken Fairbrother Hutton
McCutcheon Kennedy
Bachman Banks Farrell Young
Hernandez Wolf Pasquini Lewis Judd

ALUMNI NEWS

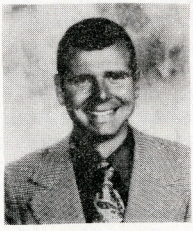
Personal Briefs on Alumni

Steve Abbott (1976) is employed as an actuarial analyst at The Travelers Insurance Company in Hartford, Conn. He has successfully completed the first three of the nine-part Society of Actuaries Examination. Steve says that insurance companies are looking for people who have been involved in extra-curricular activities in leadership roles, have good communication skills, and can think creatively. He also believes a solid background in computers is a valuable tool in actuarial work. Incidentally, Steve says he misses the California sunshine. He and his wife live at 118 Henry St., Hartford, CT 06114.

Cindy Bayless (1976) is currently living on a kibbutz (a farm commune) in the northern part of Israel. Except for a three-month vacation in the U.S., she has been at her present location for over a year. She says she lives on the kibbutz as a volunteer and hence receives no salary - just food, accommodations and some "pocket money". Her work calls for some statistics, involving as it does agricultural surveys and correlation of rate of fruit growth to irrigation procedures. She also helps with some of the routine orchard labor. She plans to remain in Israel for quite a while and would like to do some studying in the field of genetics at one of the universities there. Her mailing address is Kibbutz Misgav Am, Galil Elyon D.N., Israel.

Douglas Derr (1976) teaches mathematics at a senior high school in Zionsville, PA. His wife, Carolyn (1972) is employed in the accounting department of General Electric's small housewares plant in Allentown, PA. They have two children, a girl of age 5 and a boy, 3½. Their address is RD#1, Box 75A, Zionsville, PA 18092.

Douglas Edick (1971) teaches high school mathematics and science at Valley Christian Academy in Santa Maria, CA. His address is 544 Primrose Lane, Santa Maria, CA 93454.



Doug Edick
1971

George Girolo (1977) is currently working as a systems representative (programmer) for Burroughs. His future plans call for a master's degree in mathematics or physics. He lives at 1305 D. Street, Petaluma, CA 94952.

Brothers Thomas M. Jarrett (1976) and Edward C. Jarrett (1975) are both employed in the actuarial program at Occidental Life Insurance in Los Angeles. They highly recommend the actuarial profession for math majors who also have interests in the business field. They credit Dr. Joseph Grimes of the Computer Science and Statistics Department at Cal Poly for getting them started in actuarial work. They live at 6481 Atlantic Ave. #N109, Long Beach, CA 90805.

Charlotte Johnson (nee Bloecher, 1973) taught fifth grade at Lincoln Unified School District in Stockton the past four years. She now lives with her husband Don M. Johnson (M.E. 1975) at 113 South U St. #45, Lompoc, CA 93436.

Charlotte Johnson
1973

Jim Phillips (1975) is enrolled in the M.A.T. (masters degree in teaching) program at U.C. Davis. He hopes to graduate June 1979 and then plans to teach, preferably at the community college level. Jim's address is 1750 Hanover Drive, Davis, CA 95616.

After completing their masters degree work at Cal Poly in 1977, Jody Ann Schaffer and John Jacobs got married and now live at 2928 E. Sierra Drive, Westlake Village, CA 91361 - just a bit south of Oxnard. Both are employed at Hughes Aircraft in Canoga Park in the Operations Analysis Department. The work involves some mathematics, engineering, programming and report writing. They recommend anyone interested in this kind of work to contact Bob Winson, Systems Simulations Department, c/o Hughes at Canoga Park, for employment opportunities.

Kenneth Schulz, former math major here, is continuing work toward his B.S. in math at Cal Poly Pomona. Ken gives "better employment opportunities" in the L.A. area as his reason for changing schools. He felt he now has greater need for money as he married his high school sweetheart, Pam Smith, this past summer. The couple are residing in Whittier and both are attending school. Ken did actuarial work this past summer for Occidental Life Insurance Company. He is now faced with making a choice between two possible careers - actuarial work or systems engineering. Incidentally, Ken readily admits he'd rather be in San Luis Obispo than in Pomona - says we're friendlier, for one thing.

Lewis R. Sherman (1975) is a Senior Associate Programmer at the I.B.M. Programming Development Laboratory at Santa Teresa, CA. Currently he is involved in a project for installation and development of an I.B.M. corporate-wide Manufacturing and Engineering Management Information and Database System. He says that "travel throughout the U.S. is an interesting sidelight to this project". His future plans include graduate study in Operations Research at Stanford. He finds the housing problem very discouraging in the Santa Clara Valley area, and may decide to move somewhere less populous and less expensive. Lewis and his family (wife and two children) live at 948 Lincoln Court, San Jose, CA 95125.

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Show that given an integer consisting of a 4, a 6, and any finite number of 3's, the digits may be permuted in such a way to make the new integer divisible by 7.

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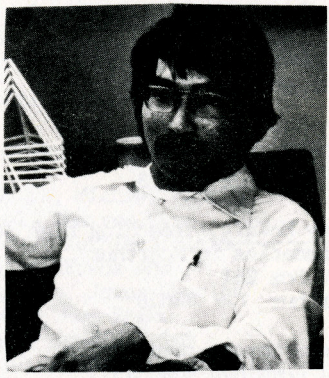
Grant Shimada (1974) is employed by the BDM Services Company at the Scientific Support Laboratory, Fort Ord, CA. BDMSC has a government contract with the U.S. Army Combat Developments Experimentation Command. Most of the experiments are conducted at Fort Hunter-Liggett, about 70 miles north of Cal Poly. Grant says his job is not too demanding, involving only a little statistics and some programming. His current address is 26 Southbank Road, Carmel Valley, CA. 93924



Grant Shimada
1974

Since his graduation from Cal Poly, Richard A. Spohn (1974) has been employed as a computer programmer for I.B.M. at San Jose. His address is 6842 Endmoor Drive, San Jose, CA 95119.

Barbara Jean Williams (nee Elliott, 1975) has been employed since her graduation as a mathematician in the Geophysics Division at the Pacific Missile Test Center at Point Mugu, CA. She coordinates all oceanographic operations within her division and was the first female given the responsibility of operations conductor at Point Mugu. Her future plans at work include utilization of the Center's new CDC Cyber 75. She and her husband, Thomas Williams, an engineer at the Test Center, include woodworking and bicycling among their hobbies. Their address is 1940 Ginger St., #42, Oxnard, CA 93030.

Additional Alumni Addresses

Here are some additional addresses of Mathematics Department alumni, together with place of employment in some cases.

Mark Brown
On Co-op w/ Burroughs Fall 78
5745 Alondra Drive
Goleta CA 93017

Lynn Campbell - medical school
7811 Chambers Road #524
San Antonio TX 78229

Scott Campbell
2107 Rockefeller #A
Redondo Beach, CA 90278

Diane Carson - Navy
10954 Galvin Avenue
Ventura CA 93003

Hanford Choy - Bell Northern Research in Palo Alto
2441 Carlmont Dr. #2
Belmont CA 94002

Babette Crabtree - teaching at Paso Robles High School
700 Curbaril
Atascadero CA 93422

Craig Friske
1056 S. Winchester Blvd. #3
San Jose CA 95128

Ron Green - Sylvania
2906 Warm Springs Drive
San Jose CA 95127

Sergio Hernandez - I.B.M.
130 Roundtable Dr., Apt. R-2
San Jose CA 95111

Bob Kernaghan - teaching at Yosemite High School
P.O. Box 2103
Oakhurst CA 93644

Inge Liem - McGaw Laboratories
2526 McGaw Avenue
P.O. Box 11887
Santa Ana CA 92711

Jill Maruyama
541 Eisenhower Drive
San Jose CA 95128

Sandy McKaig - teaching high school mathematics in McArthur
P.O. Box 261
McArthur CA 96028

Pamela Merson (nee Gerard)
1141 Cummings Road #3
Santa Paula CA 93060

Desiree Mikel
P.O. Box 203
Santa Margarita CA 93453

Stuart Moy
27722 Calles Valdes
Mission Viejo CA 92675

Lucy Sacco - teaching at St. Paul High School in Santa Fe Springs

Jeanne Santoni - Pacific Telephone
430 North Cins Dr. #401
Walnut Creek CA 94516

Kenneth Schultz
17111 Ridge Park Dr.
Hacienda Heights CA 91745

Grant Sciarani - McDonnell Douglas
3251 E. Artesia Blvd.
Long Beach CA 90805

Thomas Shaw - Sperry Univac
5117 E. Spring St.
Long Beach CA 90808

Diane Sisler-Belli - teaching 7th and 8th grades
915 Acosta Plaza
Salinas CA 93905

Van Symons - I.B.M.
3820 State Street
P.O. Box 3467
Santa Barbara CA 93105

Randy Taylor
1583 DeSoto Way
Livermore CA 94550

Bob Treder - working on Ph.D. at UCLA
260 Rancho Road
Sierra Madre CA 91024

Debbie Volk
1050 Foothill
Box 120
San Luis Obispo CA 93401

Claire Willey - I.B.M.
1520 Branham Lane #62
San Jose CA 95118
I.B.M. manager: Doris Stoessel
555 Bailey Ave.
San Jose CA 95150

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Two men are walking along a railroad track. A train passes the first man in ten seconds. Twenty minutes later it reaches the second man. It passes the second man in nine seconds. How long after the train leaves the second man will the two men meet (all speeds constant)? Direction and speeds of travel, train length, and distances are not given nor are they required.

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A farmer cuts a field of oats with a machine which takes a 5 ft. cut. The field is circular and when the farmer has been around it 11½ times (starting at the perimeter), he has cut half the area of the field. How large is the field?

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STUDENT NEWS

Recent Graduates, Mathematics Majors

Bachelor of Science

Alkhidhr, Saud Mohammed
Billing, Helen Rene*
Bunn, Shirley Ann
Crabtree, Babette Ann*
Danbom, Mary Louise*
Eitel, Joseph Edward
Gale, Gary Austin**
Grove, Yvonne Bernice**
Harp, Jannifer Arlene
Hawkins, Reid
Hernandez Cruz, Sergio Alfredo**
Ikeda, Patricia Miyo*
Kinnison, Gary Lee
Knapp, Carolyn Louise**
Mabon, Debra Lee
Maruyama, Jill Gwen
McBeth, James Michael*
McGuire, Michael Patrick
Mikel, Desiree Lynn
Murray, Kathleen Elaine
Phelps, Freda Ann
Randolph, James Charles
Ritter, Coy Steve
Roady, Ronald Prim*
Rothfuss, Beth Valerie*
Ryno, Janice Diane
Skora, Michael George
Steiger, Don
Symons, William Van*
Vag, Tamara Marie
Weiss, Deborah Lee*
Wong, Tai Sing*
Zawacki, Linda Catherine

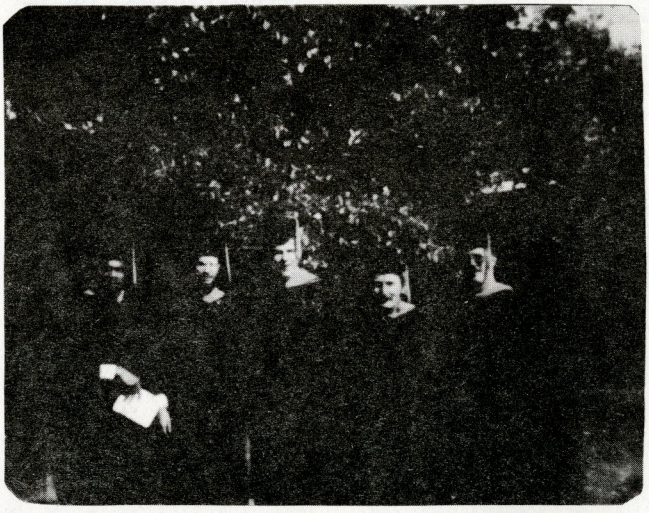
* graduated with honors

** graduated with highest honors

Dr. Charles J. Hanks
Head, Mathematics Department
with
Michael Skora, President, KME

Master of Science

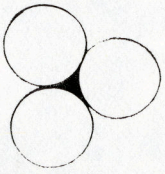
Barker, Jeffrey Charles
DeVaux, Virginia Kay
Green, Ronald Philip
Martin, Ronald Craig
Odell, Christopher Eugene
Shell, Terry L.
Tanner, Sara D.
Zinati, Farzin



Ron Martin, Chris Odell, Dr. George Lewis, Ron Green, Terry Shell

???

Determine the shaded area bounded by three tangent circles of radius 1.



???

Given two distinct boxes and four identical pencils, what is the probability that, if the pencils were placed in the boxes at random, each box has at least one pencil?

???

Master's Theses

Terry Shell, who completed his master's degree in Winter 1978, wrote his master's thesis on the p-adic numbers under the supervision of Dr. James Delany. Terry tells us what he has accomplished.

"Most people have seen algorithms for writing a number to a different base, for example, to write 31 in base 3:

$$\begin{array}{ll} 3\ \lfloor 31 & \\ 3\ \lfloor 10 & R1 \\ 3\ \lfloor 3 & R1 \\ 3\ \lfloor 1 & R0 \\ \quad 0 & R1 \end{array}$$

So $31 = 1 + 1\cdot 3 + 0\cdot 3^2 + 1\cdot 3^3$.

Now, try the algorithm for -31:

$$\begin{array}{ll} 3\ \lfloor -31 & \\ 3\ \lfloor -11 & R2 \\ 3\ \lfloor -4 & R1 \\ 3\ \lfloor -2 & R2 \\ 3\ \lfloor -1 & R1 \\ 3\ \lfloor -1 & R2 \\ \quad -1 & R2 \\ & \vdots \end{array}$$

Apparently, $-31 \stackrel{?}{=} 2 + 1\cdot 3 + 2\cdot 3^2 + 1\cdot 3^3 + 2\cdot 3^4 + 2\cdot 3^5 + \ldots$
$= (2 + 3 + 18 + 27) + (2\cdot 3^4 + 2\cdot 3^5 + \ldots)$.

If we pretend the "tail-end" is a geometric series we obtain

$$-31 = (2 + 3 + 18 + 27) + \frac{2\cdot 3^4}{1-3} = 50 + -81 = -31.$$

In the words of Dr. Delany, "We must have done something right." That something deals with the p-adic numbers.

P-adic numbers are created through a completion process using a different kind of absolute value (called the p-adic valuation). For each prime, p, a quotient field can be obtained; that is, there is a field of 2-adic numbers, 3-adic numbers, 5-adic numbers, etc.

My goal was to find when a quadratic with rational coefficients is solvable in each p-adic field (each p-adic field contains the rationals).

As I taught myself arithmetic in each p-adic field, I noticed enlightening analogies to the real numbers, and I think anyone would find the arithmetic section of my thesis interesting. These analogies, together with Dr. Delany's invaluable insight, led me to a complete answer of when square roots are in each p-adic field (which ultimately is based on facts about quadratic residues)."

???

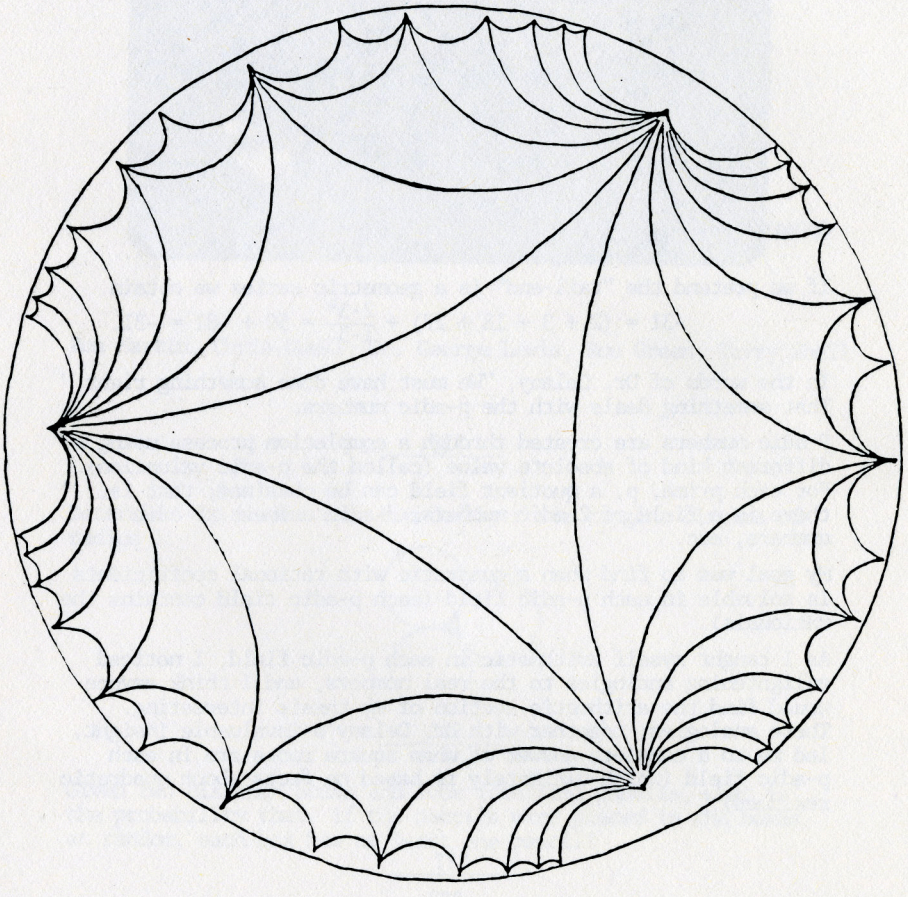
Prove that the G.C.D. of two numbers is equal to the G.C.D. of their sum and their L.C.M.

???

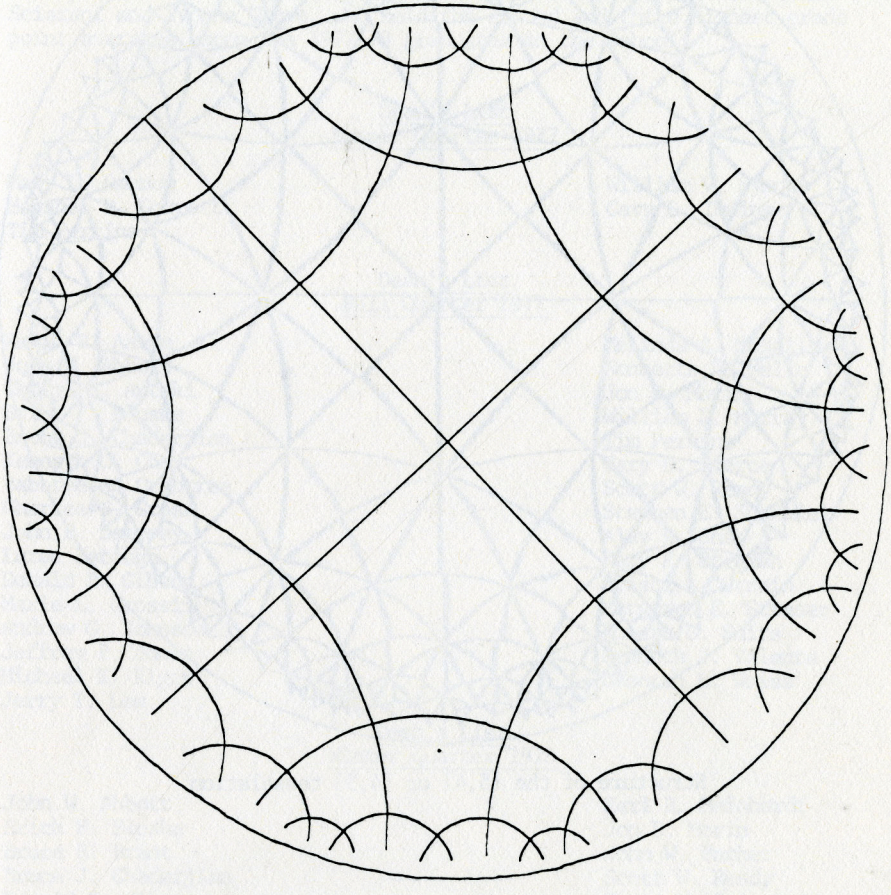
Jeffrey Barker, who completed his master's degree in Spring 1978, also wrote his thesis under Dr. James Delany. In the following abstract from his thesis, Jeffrey tells us about his explorations of regular tesselations in the hyperbolic plane and shows off some of his handiwork.

"My thesis details a method for drawing any regular tesselation in the hyperbolic plane. Reflections of the elementary cell and drawings of the tesselations were done with the aid of a computer. The computer produced consistently accurate drawings with far greater ease than when attempted by hand.

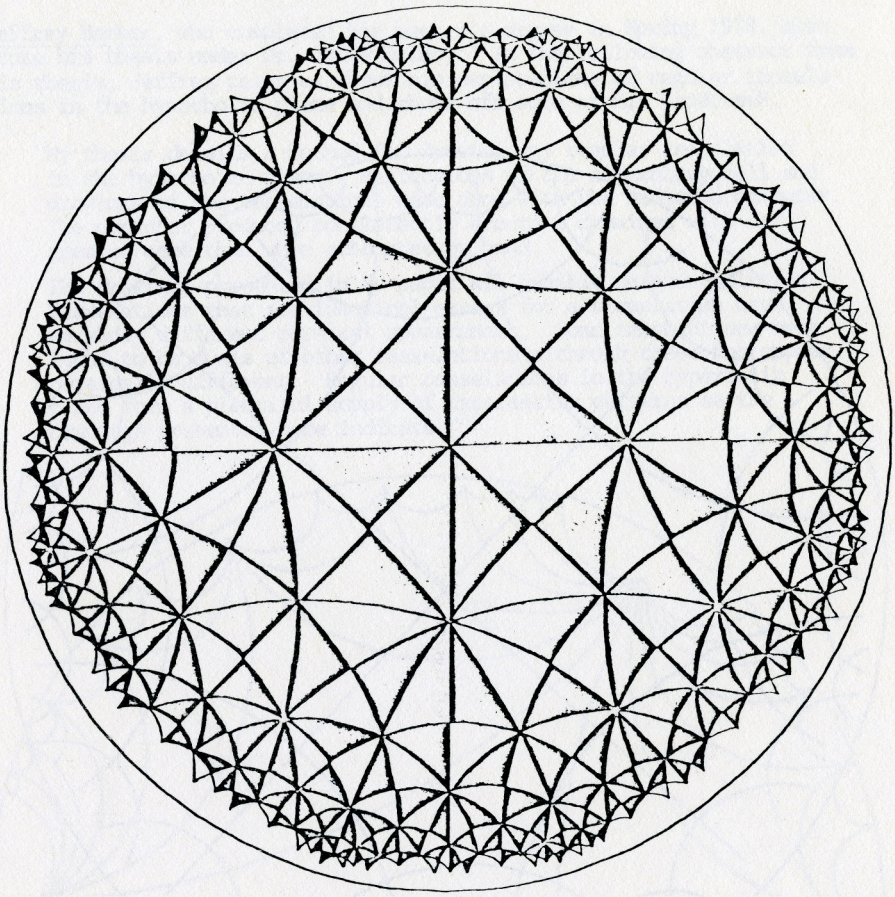
The drawings presented in my paper all exhibit unique qualities. Tesselations that are identical except for a translation have markedly different physical appearances. Some tesselations were found to be duals of other tesselations although these too appear physically different. Regular tesselations in the hyperbolic plane form a plentiful supply of interesting patterns as the drawings presented here indicate."



3-gons, 50 at a vertex



5-gons, 4 at a vertex



Structure of the {5,4} or {4,5} tesselation

Outstanding Mathematics Student Award

The 6th annual Excellence in Mathematics Award for the outstanding mathematics student went to Donald Gibson from San Francisco. The award, which includes $100 cash from the Mathematics Department Discretionary Fund, was presented to Mr. Gibson at the last department meeting of the 1977-78 school year, May 30, 1978. The presentation was made by Dr. Tom O'Neil, a member of this year's committee to select the winner for this award. Mr. Gibson was selected for his dedication in the pursuit of mathematical knowledge, his high score on the Putnam exam (he ranked 319th out of 2138), and his high grade point average (he ranks second highest in the School of Science and Mathematics).

Fisher Award

Winner of the Clyde P. Fisher Memorial Scholarship was Mary F. Henrickson, Mathematics major from Susanville, California.

Honors Luncheon

The annual honors luncheon, at which the academically outstanding graduating seniors in the School of Science and Mathematics are recognized, was held on May 24, 1978. Mathematics majors honored at this event were Grant Sciarani and Yvonne Grove, who held the second and third highest grade point averages among the 1977-78 graduates in the school.

Dean's List
Summer Quarter 1977

Mary L. Danbom
Marshal R. Garrett
Tim Perkins
William V. Symons
Gary L. Thwing

Dean's List
Fall Quarter 1977

Kevin R. Aaron
John W. Abbott
Cheryl K. Antaki
Erick F. Bluske
Bruce J. Chaderjian
Kenneth C. Choy
Babette A. Crabtree
Charles B. Cross
John P. Dempsey
Larae Eatough
Donald B. Gibson
Marie L. Grossi
Andrew G. Johnson
Jeffrey P. Jones
Michael E. Kiger
Jerry T. Lew
Melinda A. McNally
Nonnette D. Mello
Jon D. Morin
William N. Murray
Tim Perkins
Gary D. Pierce
Scott W. Ready
Stephen E. Schaniel
Ajay R. Shah
Mary E. Stegman
Cristi L. Strain
Margaret E. Straser
Robert D. Suits
Kenneth J. Valente
Deborah L. Weiss

Dean's List
Winter Quarter 1978

John W. Abbott
Erick F. Bluske
Bruce R. Brant
Bruce J. Chaderjian
Donald B. Gibson
Valerie C. Grosshans
Yvonne B. Grove
Dana L. Jenkins
Cynthia C. Jones
Jeffrey P. Jones
Jerry T. Lew
Karl R. Meinhardt
Jon D. Morin
John W. Parker
Scott W. Ready
Grant N. Sciarani
Mary E. Stegman
Cristi L. Strain
Gary L. Thwing
Kenneth J. Valente
Janet L. Wattenbarger

???

Is there a number whose six divisors, listed in order from smallest to largest, are _ _ _ _ 6 _ _ ? If so, is it unique? (The divisors include 1 and the number itself.)

???

Dean's List
Spring Quarter 1978

John W. Abbott
Erick F. Bluske
Bruce R. Brant
Bruce J. Chaderjian
Doreen L. Dalfol
Carl J. Darby
Larae Eatough
Donald B. Gibson
Rosemary A. Green
Valerie C. Grosshans
Marie L. Grossi
Yvonne B. Grove
Laura J. Hansen
Cynthia L. Hummel
Patricia M. Ikeda
Cynthia C. Jones
Jeffrey P. Jones
Jerry T. Lew
Melinda A. McNally
John P. Munson
Julie A. Pfeiffer
Gary D. Pierce
Beth V. Rothfuss
Ajay R. Shah
Cristi L. Strain
Robert D. Suits
Beth A. Sutherland
Nancy A. Tennison
Gary L. Thwing
Deborah L. Weiss

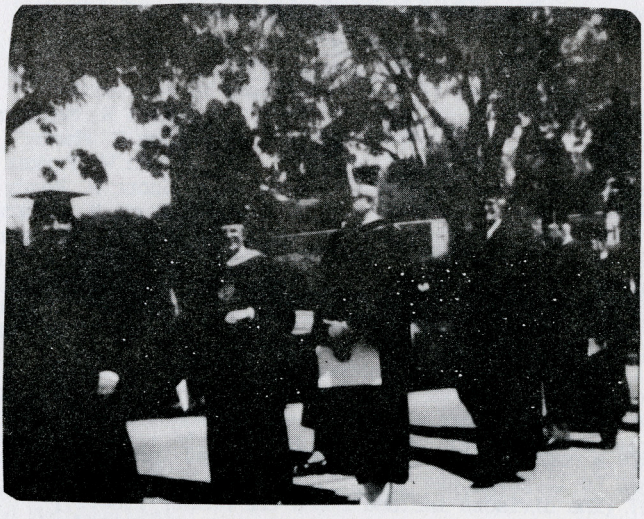
Dean's List
Summer Quarter 1978

John W. Parker
Grant N. Sciarani
Alice F. Woo

President's List
Academic Year 1977-78

John W. Abbott
Erick F. Bluske
Bruce J. Chaderjian
Donald B. Gibson
Jeffrey P. Jones
Jerry T. Lew
Cristi L. Strain
Gary L. Thwing

Commencement, June, 1978



Dr. Robert E. Kennedy, President of the University
with
Roy T. Brophy, Chairman, CSUC Board of Trustees, and
Dr. Dale W. Andrews, Exec. V. P. of the University

HAPPENINGS IN THE DEPARTMENT

Joint AMS and MAA Meeting

Our alumni may be interested in hearing of a new first for Cal Poly's Mathematics Department. On November 11-12, 1977, we hosted a joint meeting of the American Mathematical Society and the Southern California Section of the Mathematical Association of America. The Society scheduled a two-day program of one-hour talks, six special sessions of selected papers, and two general sessions of selected ten-minute papers. The general theme of the Association meetings was "Theoretical, Practical and Pedagogical Questions Related to the Teaching of Calculus and Differential Equations". In addition to the above, two social events were on the agenda: a barbecued chicken dinner at the San Luis Obispo Country Club, and a Saturday luncheon in the Faculty Dining Hall featuring an address by Constance Reid, author of several books on mathematics.

Local chairman in charge of arrangements was Dr. Euel W. Kennedy. He had strong support from the Mathematics Department - notably from Estelle Basor, Jim Delany, Ed Glassco, Stuart Goldenberg, Harvey Greenwald, Adelaide Harmon-Elliott, Kempton Huehn, Boyd Judd, Jean McDill, Raymond Terry, and Patrick Wheatley.

Mathematics Colloquia

The school year 1977-78 was a busy one for the Mathematics Department colloquia schedule. Visiting speakers (with titles of their talks in parentheses) were:

Stanley G. Williamson, U.C. San Diego (Linear Graph Algorithms)
W. D. Weir, Naval Postgraduate School (Hewitt-Nachbin Spaces)
Frank Flanigan, San Diego State (The Radical Embedding Problem and Some History of Modern Algebra)
Neil Gretsky, U.C. Riverside (two talks: Optimal Inspection, and Topics in Banach Spaces)
Lawrence Shampine, Sandia Corporation (two talks: What Everyone Solving Differential Equations Numerically Should Know, and The User's View of Solving Stiff Differential Equations)
Buck Ware, Cal State Chico (Is 22/7 Really the Closest Number to π?)
Howard Stauffer, Cal State Hayward (two talks: Spatial Distribution, and Derivation of the Weibull Distribution)
Massimo Fischetti, Physics Dept., U.C. Santa Barbara (Stochastic Processes and Quantum Field Theory)
Patrick Suppes, Institute for Mathematical Studies, Stanford (Computer Assisted Instruction at the University Level)

In addition to the above visiting speakers, John Todd of CalTech was the banquet speaker at the KME banquet, May 20, 1978, and the following Cal Poly Mathematics Department faculty also presented colloquium talks: Eric Langford, Visiting Professor from University of Maine, Estelle Basor, George W. Luna, Kent Morrison, Stephen V. Noltie, Martin T. Lang, J. Myron Hood, Robert Wolf, and Paul Murphy.

In Fall 1978, Dr. Ronald Sverdlove of the University of Notre Dame spoke about his experiences at the Claremont Graduate School "Mathematics Clinic", of which he is a former director. The Clinic has been successful at contracting with industrial firms to solve mathematical problems. Undergraduate and graduate teams work to define, formulate, and (hopefully!) solve a problem, and interpret the results. Also, Dr. Harold Widom of U.C. Santa Cruz spoke on "The Szego Limit Theorem".

1978 Poly Royal

Questions, kites, and computers - with traditional smiles and enthusiasm, the Cal Poly Math Department opened its doors for the 1978 Poly Royal weekend. The busy weekend of April 28 and 29 saw more than 100,000 visitors on campus, and many of them found their way as special guests of the Mathematics Department. Carrying on a tradition 26 years old, we hosted the Poly Royal Math Contest in which high school students from all over California competed. The three big events were the Written Contest, the Chalk Talk Contest, and the Audience Participation Test. A total of 254 seniors from 94 high schools participated in the Written Contest, which was won by the team from North Hollywood High School. The top individual score was shared by Bart Rothwell from Los Altos High School and Joseph Barsugli from North Hollywood High School. The Chalk Talk Contest, which had 51 junior class entries, was won by Stuart Davidson from Rolling Hills High School.

Certainly the Math Contest was a highlight of "Our Piece of the Action" (theme for the 1978 Poly Royal); but it was by no means the only thing going on. Dr. Lang entertained many visitors on a minicomputer which was programmed to simulate lunar landings and produce personal biorhythms, among other things. Also many interesting movies about math were shown for the younger visitors, possibly to recruit future math majors early.

The Cal Poly Math Club transformed a classroom into a mind teaser room full of geometric kites, puzzles and games. And another very popular event was the Math Magic Show - led by Dr. McDill.

All in all, last year's Poly Royal was a great success thanks to student and faculty participation, and it doesn't seem at all too soon to start thinking about next year's Poly Royal!

1979 Poly Royal

This year's Poly Royal will occur April 27-28. Alumni are cordially invited to come and share refreshments with faculty and renew acquaintances. Incidentally, we are always pushed to our limits to come up with prizes for the annual Poly Royal Mathematics Contests - so any ideas (and contributions!) from alumni will be greatly appreciated. Please send your suggestions for prizes to Dr. Martin T. Lang, Contest Director, Mathematics Department, Cal Poly, San Luis Obispo CA, 93407. Checks may be made out to Mathematics Department Discretionary Fund and mailed to Mrs. Peggy Young, Mathematics Department Secretary. Any contributions are, of course, tax-deductible.

Putnam Examination

Seven Cal Poly students participated in the 38th Annual William Lowell Putnam Mathematical Competition on December 3, 1977. The Cal Poly team consisting of Charlie Cross, Donald Gibson, and Jeff Jones (Math) ranked 93rd among the 266 schools from the U.S. and Canada which entered teams. Other contestants from Cal Poly were Ken Choy, Alan Bell, Christopher Black (Math), and Mike Helms (ME). It is anticipated that 14 Cal Poly students will enter the competition on December 2 this year. The team members will be Charlie Cross, Donald Gibson, and Ken Choy.

Cooperative Education Program

This program may be mentioned elsewhere in this Newsletter, so please forgive us for bringing it up again. Supervised by Dr. Ralph M. Warten, this program offers mathematics majors the opportunity to "earn while they learn", to receive university credit, and to retain their student status while they are working with industries or government for periods of three to six months.

Alumni with strong ties in industry or government are urged to contact Dr. Warten or Dr. Charles J. Hanks, Department Head. We need your ideas, suggestions and assistance in order to make this program go. Since Winter 1977 we have managed to place 20 of our majors on Co-op assignments.

Curriculum Changes

Dr. Farrell, chairman of the Curriculum Committee, has alerted us to the following changes in the mathematics curriculum. History of Mathematics will now be split between two courses, Math 419 and Math 519. The former will be required of all teaching option majors. The latter is a course in topics in the History of Mathematics. A new course, Math 405, Engineering Transform Methods, will be taught in conjunction with the Engineering School.

???

Starting with a square that measures 12 inches on each side, a second square is inscribed within the first square by joining the midpoints of all four sides. Then a third square is constructed by joining the midpoints of the side of the second square. If this procedure is continued indefinitely, what is the sum of the perimeters of all the squares?

???

Left to right: Dr. Tom Hale, Dr. Jean McDill,
Mrs. Anna Milliken, Dr. Tom Haskell, Dr. Keith Milliken

Time-Sharing Programs

Dr. Kempton Huehn has been compiling a library of programs on the local time-sharing system. The following list describes the programs which are presently available. An asterisk indicates the program is available for student use.

*SIMEQT	(≤20x20) solves a system of linear algebraic equations, including more or less equations than unknowns
*ECHLON	(≤20x20) finds the row, and row-reduced, echelon form for a given matrix; in addition it can solve a system of linear algebraic equations and find inverses
*ELEROW	(≤10x10) performs elementary row operations on a given matrix
*JACOBI	(≤10x10) finds the eigenvalues and eigenvectors for a real-symmetric matrix using Jacobi's method
*TOEPLZ	(≤10x10) computes the inverse of a Toeplitz matrix or solves a Toeplitz system of algebraic equations
*MARKOV	(≤10x10) computes powers of a transition matrix or distribution vectors in Markov processes
DPLOT	(≤1000) plots data either from a deck file or the terminal; can be extended to plot two or more sets of data on the same lineprinter graph
SEARCH	performs a one dimensional optimal search of functional values over a given interval using one of the following methods: dichotomous, Fibonacci or Golden Section
DSC	performs a one dimensional optimal search of functional values using the Davies-Swann-Campey algorithm
FFTn	a collection of programs that perform a discrete Fourier analysis on input data to determine the presence of periodic elements
STATn	a collection of programs that perform a variety of statistical analysis on data

???

A disk of radius $r < 2$ is rolled around the interior of a rectangle of dimensions 6 x 8, always touching the edge. What is the area of the region that has been covered by the disk after one trip around the rectangle?

???

How many distinct planes are determined by the vertices of a cube?

???

Second Annual Math Sciences Career Conference

In an effort to enable the math and related sciences students to meet with and talk to people in industry, Dr. Harmon-Elliott originated the Career Conference Day. It is sponsored by Kappa Mu Epsilon.

February 23, 1978, was the Second Annual Career Conference day. The theme of the event was "Careers in Industry and Government." It was conducted in the form of a panel discussion with Professor John Lowry as the moderator. The speakers were:

Richard Terrell	IBM Corporation
Lewis Willeford	Sperry Univac
Richard Zwakenberg	Lawrence Livermore Labs
Glenn Wilson	State of California Department of General Services

Math Tutoring

The ASI Tutorial Center is a program to help the students with their school work. It is funded by the ASI and coordinated by the Learning Assistance Center.

The Tutorial Center is located in Room 112 of the University Union. It is open to any student on a drop-in basis. Help is offered in a variety of subjects, but the majority of the tutorials are for math. From among the math classes, the greatest need is in calculus--Math 141 through Math 241.

Currently, the Tutorial Center has hired to their budget's limit. Service is better now than it used to be, though a few more tutors would be of great help.

There are also math graduate students tutoring who are under a different program which is coordinated by Dr. George Lewis of the Mathematics Department.

???

Geometry Puzzler

(1) It has three feet, yet can't walk.
(2) A dead parrot.
(3) What a person should do when it rains.
(4) They voted "yes" for better tractors.
(5) A triangle that is never wrong.
(6) A place where people are sent for committing crimes.
(7) A gentleman who goes to the beach.
(8) A favorite dessert.

(1) yardstick, (2) polygon, (3) coincide, (4) protractor,
(5) right triangle, (6) prism, (7) tangent, (8) pi

Answers

???

MATHEMATICS EDUCATION

Mathematics Education Forum

The National Science Foundation has awarded a grant of $13,051 to Cal Poly's Mathematics Department to support a Mathematics Education Forum for the Central Coast. The general purpose of the Forum will be to encourage and support in-service mathematics education for pre-college mathematics teachers of this area. Forum activities will be aimed at improving teacher knowledge of mathematics and mathematics education and developing and maintaining communication and cooperation between local teachers and mathematics educators at Cal Poly.

The project will be under the direction of Dr. Alan W. Holz. Other members of the Mathematics Department who will staff the Forum include: Dr. Adelaide T. Harmon-Elliott, Dr. Rex L. Hutton, Dr. Martin T. Lang, Dr. H. Bernard Strickmeier, and Dr. Neal R. Townsend.

The Forum will consist of four major components. The first component will be a series of invited lectures by well-known mathematics educators open to all Central Coast mathematics teachers. The second component will be a series of quarterly seminars for small groups of selected secondary teachers of mathematics. The third component will be a series of in-service workshops for elementary teachers. The final component will be a periodic newsletter for Central Coast mathematics teachers aimed at publicizing the activities of the Forum and motivating participation in them.

Guest Lecture Series

Two of the three speakers for the lecture series have been selected. We are extremely fortunate that Robert Davis and Shirley Hill have accepted invitations to speak.

Professor Robert B. Davis of the University of Illinois will speak on January 16. Dr. Davis was educated at MIT completing work in mathematics, psychology, and physics. He was a leader in the "new math" movement as director of the Madison Project at Syracuse University from 1957 until 1972. He is currently Director of the Curriculum Laboratory, Acting Principal of the Laboratory School, Associate Director of the Computer-Based Education Research Laboratory, and Professor of Education at the University of Illinois. Dr. Davis has conducted and published a prodigious amount of research in mathematics education over the past twenty-five years. He is currently involved in research on children's learning of mathematics with grants from N.I.E. and N.S.F.

Dr. Shirley Hill, Professor of Education and Mathematics at the University of Missouri, Kansas City, will speak on March 1. Professor Hill is a noted teacher and researcher in the field of mathematics education. She is highly involved in the leadership of the National Council of Teachers of Mathematics of which she is currently the president elect.

???

What did the little acorn say when it grew up?

Answer: Geometry.

???

Seminar in Progress on Computer Applications to Mathematics

Ten teachers of secondary school mathematics are currently involved in the fall seminar on computer applications to mathematics under the direction of Professor Martin T. Lang. The seminar meets Wednesday evenings from 5 to 9 PM. Topics being studied include: Modern computers and computer systems; an introduction to computer language; and applications of computers to secondary school mathematics teaching. The language used is BASIC, and the primary computing resource is Cal Poly's PDP 11/45 computer timesharing system. The Tektronix 4051 Graphics System is also used in connection with special projects and for classroom demonstrations.

Winter Seminar for Secondary Teachers

The winter seminar which will be conducted by Dr. H. Bernard Strickmeier, is entitled "Mathematical Problem Solving." The primary objectives of the seminar are:

a. To help participants better understand the problem solving process and to improve their own problem solving abilities.
b. To help participants improve their ability to present problems and to guide others through the problem-solving process.
c. To encourage participants to utilize knowledge gained in the seminar in their own teaching.

Problems for the seminar will be selected from several content areas of mathematics. Problems will be challenging and non-routine but will not require mathematical knowledge beyond high school or in some cases beyond elementary calculus. The text for this course will be Mathematical Discovery, Volume I, by George Polya. This book, which contains a large number of interesting and challenging mathematical problems, will be the major source of seminar problems.

At early meetings, the instructor will lead the seminar discussions. In these initial discussions useful patterns followed in the problem-solving process will be formulated. At later meetings, participants will experience cooperative problem solving in small group settings. Finally, each participant will have the experience of guiding the seminar group through the solutions of selected problems. Applications of problem-solving techniques to secondary mathematics teaching will be emphasized throughout the quarter.

The seminar will meet on Tuesday evenings during the winter quarter. Participants will receive 3 units of credit in Math E470, Selected Advanced Topics. No fees will be charged and a group meal will be provided at each meeting at no cost to the participants. The group meal will afford participants the opportunity to interact among themselves and with the instructor and other members of the Cal Poly Mathematics Department in an informal atmosphere.

Spring Seminar for Secondary Teachers

The spring quarter seminar is entitled "Statistics for Secondary Mathematics Teachers" and will be offered by Dr. Neal R. Townsend. The seminar will be built around topics in probability and statistics that may be taught to high school students having algebra backgrounds. The emphasis will be on practical applications of statistical inference and the thrust will be toward estimation and hypothesis testing. Use of a pocket calculator will be encouraged. Applications in the fields of science, business, agriculture, education, medicine, economics, and government will be studied. The case for teaching probability and statistics in high school will be discussed.

Workshops for Elementary Teachers

The Forum will offer a series of workshops for elementary teachers of mathematics (grades K-8). These workshops are an outgrowth of Cal Poly's 1977-78 NSF project for elementary teachers. The workshops will be arranged with local school districts and will be held after school at selected elementary schools. Each workshop will be arranged individually and topics will be suited to the interests of the teachers and the needs of the participating schools. Each workshop will be open to all of the teachers in a school or small group of schools. Each workshop will carry one-third of a unit of credit in Math E400, Special Problems. Tentative topics to be offered in the workshops are:

1. Manipulatives for Teaching Set and Number Concepts
2. Devices for Teaching Computational Skills
3. Using the Hand-Held Calculator in the Classroom
4. Measurement and the Metric System
5. Models for Teaching Geometric Concepts
6. Probability Experiments
7. Concept Development in Elementary School Mathematics
8. Developing Mathematical Skills in Children
9. Curriculum and Methods for Elementary Mathematics

Other topics may be arranged to meet the individual needs and desires of the teachers in an applying school.

Communications

Communications regarding the operations of the Forum should be directed to:

Dr. Alan W. Holz, Director
NSF Mathematics Education Forum
Mathematics Department
California Polytechnic State University
San Luis Obispo, CA 93407

Phone: 546-2632 (Office), 528-2617 (Home)

Secondary Math Test

Dr. Allen Miller calls our attention to a math test comprised of problems taken from the final exams given by the National Association of Independent Schools to secondary students over the past decade. A copy of the test can be found in the May-June 1978 issue of the magazine GAMES, pp. 50-51.

???

At twelve o'clock noon, there are 10 flies in a certain room. One hour later, the room is completely filled with flies. If the number of flies doubles each minute, at what time is the room one-fourth full of flies?

???

CLUB NEWS

The History of KME

Does the name "Emily Kathryn Wyant" mean anything special to you? In 1931 she founded Kappa Mu Epsilon, a national society designed for the mathematical undergraduate student. Dr. Wyant and her colleagues realized the necessity for such an organization, as they were involved with Pi Mu Epsilon which was made for the instructors and advanced mathematical students, and they discovered that there was a need for such a society at the undergraduate level. In 1930 she went to the Northeastern Oklahoma State Teachers College as a professor of mathematics, keeping in mind her intentions of establishing the first chapter of KME in this school by expanding the already existing math club. With the greatly appreciated help of L. P. Woods who was the head of the Department of Mathematics and Dean of Men at the Oklahoma College, the organization started on its way to become a significant part in the lives of many.

Although the name of Dr. Wyant may have been unknown to most of you, there is a name that is equally significant to the history of Cal Poly's chapter of KME. This is the name of George R. Mach. Dr. Mach was quite active in the Iowa Alpha Chapter of KME when he was attending Iowa State Teachers College in Cedar Falls, Iowa. After Dr. Mach received his B.A. degree, he went on to graduate school and then to the military. Upon reaching Cal Poly he discovered that no KME chapter had been established here. There were several faculty members who had been in KME as students in their respective alma maters, yet none had taken the initiative to establish a chapter at Cal Poly.

Dr. Mach wrote letters to find out how we might start a KME chapter at Cal Poly. One of the major requirements was that we have a well-established, active math club. A math club had been formed here in 1949 but by 1954 when Dr. Mach came it was no longer active. So he got the club going with lots of members and activities so that when we applied for a chapter of Kappa Mu Epsilon a charter was granted.

After some paperwork and a few bureaucratic procedures, a Kappa Mu Epsilon chapter was established at Cal Poly. The first initiation banquet was held on May 23, 1958, and thirty people attended. The first officers elected were as follows: Joe Bryant, president; Robert Minami, vice president; Jerre Zimmerman, secretary; Richard Eckerman, treasurer. Dr. Mach was the corresponding secretary and faculty advisor.

As an aside, Dr. Mach and Dr. W. Boyd Judd are the only two faculty members still at Cal Poly from the original 1958 "cast" when the chapter was first formed. From the time our chapter was established, there have been several faculty advisors including Dr. Mach, Dr. Judd, Dr. Neal Townsend, Dr. Ralph Warten, and Dr. Adelaide T. Harmon-Elliott.

A big part of KME is the Biennial Convention. It is held at a college somewhere in the United States, usually in the midwest or further east, and students from all over the country attend. Since 1959 Cal Poly has had at least one representative at each convention - quite an impressive record. Moreover, several Cal Poly students have presented papers at these conventions. In 1967 Joyce Curry-Daly presented her topic of "Finite Differences and the Summation of Series." Charlotte Cleis presented "A New Approach to Conic Sections" in 1969. The most recent representative speaker was

J. Kenneth Haygood who in 1973 spoke on "Getting the Most Out of Random Number Generators." The next convention will be in April of 1979, and we hope to have some of our members submit papers for presentation.

So you see how the actions of one man can be so very important. George Mach had a hope for Cal Poly, and with that dream he established the California Gamma Chapter of Kappa Mu Epsilon. Except for the time he was on leave of absence, he has always been our corresponding secretary and for more than 10 years he was also the faculty advisor. He didn't stop there, however, as is evident by the following list of some of his activities with KME at the national level:

1965-1969 . . . . . Associate Editor of THE PENTAGON
1966-1969 . . . . . National Vice President
1969-1973 . . . . . National President
1973-1977 . . . . . Past President
1977-present . . . National Secretary

It is the hope of we who are presently attending Cal Poly and are actively involved with KME that you can perhaps appreciate the organization a little more after reading this, as you now have some insight on how this society evolved and how much work was put into establishing our chapter here in San Luis Obispo. We all have a lot to be thankful for, especially when it comes to people like Dr. Emily Kathryn Wyant and Dr. George R. Mach who cared enough to get involved and actually do something so that those around them could benefit.

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You have four nines (9,9,9,9). Arrange them to total 100. You may use any arithmetical process--addition, subtraction, multiplication, or division. Each nine must be used once and only once.

???

A rope hangs over a pulley. On one end a weight is attached and on the other a monkey. The weight of the monkey equals the weight of the weight. The combined ages of the monkey and its mother equal four and the rope weighs four ounces to the foot. The weight of the monkey equals in pounds as much as its mother is years old. The mother is twice as old as the monkey was when the mother was one-half as old as the monkey will be when the monkey is three times as old as its mother was when she was three times as old as the monkey was. The weight of the rope and the weight of the weight is one-half as much again as the difference between the weight of the weight and the weight of the weight plus the weight of the monkey. How long is the rope?

--Arizona Teacher of Mathematics

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KME Highlights: 1977-78

Kappa Mu Epsilon, under the dedicated advisorship of Dr. Harmon-Elliott, completed another rewarding year of service to Cal Poly's mathematical sciences. KME alumni have been receiving the Wild Rose Newsletter and so have no doubt been keeping abreast of their society's doings. The newsletter, published quarterly by the California Gamma Chapter of Kappa Mu Epsilon, was begun in the Fall of 1977 under the editorship of Nanette Harter.

As usual, KME opened its 1977-78 year with its annual picnic at Cuesta Park on October 8, co-sponsored with the Math Club. Throughout Fall Quarter, the members held numerous workshops in preparation for the Spring Junior High School Math Contest. KME helped the Mathematics Department host the Fall joint meeting of the American Mathematical Society and the Mathematical Association of America, held at Cal Poly on Friday and Saturday, November 11 and 12. Meanwhile, the 21st biennial convention of Kappa Mu Epsilon was held at Muskingum College, New Concord, Ohio, November 10-12. Attending the convention from our chapter were Robert Watanabe, past chapter president, and Dr. George Mach, chapter corresponding secretary and National Secretary of the society. Finally in the Fall Quarter, KME held its Christmas Social and Pledge Ceremony on December 2, at which 18 new pledges were introduced. Guest speaker of the evening was Dr. Stubbs of the Computer Science and Statistics Department, who spoke on computers in the upcoming years.

The highlight of the Winter Quarter for KME was the Career Conference held in the Home Economics Lounge on February 23. This successful event is discussed in greater detail in another article.

Spring Quarter was again filled with a variety of activities. On the evening of March 31, KME members and friends welcomed 22 new pledges and congratulated the 23 members of KME who will be graduating in 1978. Dr. Bailey, Associate Dean of the School of Science and Mathematics, honored us with a talk on values. On Saturday, April 1, KME co-sponsored the annual Junior High Math Contest, challenging the math skills of 200 7th, 8th, and 9th graders from throughout San Luis Obispo County. KME was proud to be the support staff of the 26th Annual Poly Royal Math Contest sponsored by the Mathematics Department.

The Spring initiation banquet was held on May 20 at the Vista Grande Restaurant on campus. Our invited speaker was Professor John Todd, a noted numerical analyst from the California Institute of Technology. Dr. Todd spoke to us on "What Mathematicians Can Do, Do, and Ought To Do." He was accompanied by his wife, Olga Taussky-Todd, also a noted mathematician and professor of mathematics at Cal Tech. Mr. and Mrs. Todd radiated their infectious enthusiasm for mathematics. We were deeply honored to have them with us, both at our banquet and at our Sunday, May 21, brunch, which was graciously hosted by Dr. Dina Ng at her lovely home.

???

A boy stands on a street corner and tosses a coin. If it falls heads, he walks one block north, if it falls tails, he walks one block south. At his new position, he repeats the procedure. What is the probability that after having tossed the coin eight times, he is two blocks from his starting point?

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KME News: Fall Quarter 1978

KME and the Math Club started off the 1978-79 school year with a chicken barbecue at Cuesta Park on Wednesday, October 4. Nearly 80 people attended, eating barbecued chicken, beans, salad, and garlic bread, and playing softball until dark.

On October 5, Ken Larson from the Placement Office lectured to interested students on how to prepare a resume and he gave us literature describing what a good resume and letter of application should be. He further informed us of what employers look for in their interviews.

KME's first meeting was held Thursday evening, October 12, with its new president, Jeff Jones, presiding. Plans for the coming year were discussed and committee duties were outlined. The club's duties during Fall Quarter will primarily be to organize the county-wide Junior High School Math Contest which is held each year. The members of KME and the Mathematics Department faculty co-sponsor this event with the San Luis Coastal School District.

Pledgemaster Dan Moczarny held a meeting of all pledges on Wednesday, October 18, at which time he informed them of the activities and duties of KME. This year, Fall Quarter pledges number 15 students majoring in math, computer science, or statistics.

Each Thursday evening meeting until Thanksgiving will be work oriented. The committee workshops for the Junior High School Math Contest will gather at these meetings. As a means of relaxation from work, there will be several invited speakers. Some of the speakers for these relaxation periods during Fall Quarter will be Dr. Attala from the Computer Science and Statistics Department and Dr. Mueller from Computer Services.

On December 1, the Christmas Social and Pledge Ceremony will be held in the Staff Dining Room. The short ceremony is the formal presentation for all Fall pledges. The social will provide us with an opportunity to gather in the Christmas spirit. The guest speaker will be the Dean of Students, Dr. Russ Brown.

KME has also planned this year to go caroling at rest homes and convalescent hospitals in the area. This will take place on the afternoon of December 9.

Math Club Activities

In addition to the usual preparations for next year's Poly Royal, where they plan incidentally to sell biorhythms(!), the members of the Math Club hope to enjoy some fun, relaxing activities during the school year. They got off to a good start by co-sponsoring a picnic at Cuesta Park with Kappa Mu Epsilon. The event was a great success, with nearly eighty people in attendance. Since the picnic, members took a trip to the Mustang Water Slides at Lopez Lake. Future activities include potluck dinners, sand skiing, and possibly taking in the Melodrama show in Oceano. Also on the agenda is an information meeting with Dr. Ralph Warten of the Mathematics Department to learn more about the Cooperative Work-Study Program.

The goals of the Math Club are to provide opportunities for students in mathematics to become better acquainted with one another and with the Mathematics Department faculty in an outside-of-class atmosphere, to share common experiences, and to hear talks of mathematical interest. President of the club this year is Jon Morin; faculty advisors are Dr. Estelle Basor and Dr. Robert Wolf.

OUR STAFF

Math Newsletter Number 1, Fall 1978

Editor

Charles Pasquini

Faculty Advisor and Contributor

Dr. W. Boyd Judd

Contributors

Susan Dagnall
Mary Danbom
Margi Straser
Jan Wattenbarger
Alice Woo

Photographer

Greg Thon

SPECIAL NOTE TO ALUMNI

If you are not receiving the university publication CAL POLY TODAY which contains news about the university, sports, alumni notes, etc., and would like to, please send your name, address, and the year you left Cal Poly to:

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Administration Building, Room 210
California Polytechnic State University
San Luis Obispo, CA 93407

WHAT'S NEW WITH YOU????? Tell us about your job, family, travel, etc.

Please mail to: Dr. Boyd Judd
Mathematics Department
California Polytechnic State University
San Luis Obispo, CA 93407

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First Name Maiden Name Married Name

Address City State Zip

Graduation Date Degree Social Security Number

Occupation

Mathematics Department
California Polytechnic State University
San Luis Obispo, California 93407