POINTS AND ANGLES

Newsletter of the Metropolitan Mathematics Club of Chicago

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EXPLORING MATHEMATICS THROUGH INTERACTIVE ANIMATION

AUDREY WEEKS

BY CONRAD WAYNE

Audrey Weeks will use Geometer's Sketchpad to illustrate/demonstrate that today's technology can capitalize on the fact that essentially all of use are visual learners. We will explore advanced applications of movement, simulation, and morphing that greatly enrich exploration of key ideas from pre-algebra through calculus, making these concepts accessible to a wider range of students. We will also explore engaging and unusual "What if…?" situations and use "Let's see if…" with animations to assist us greatly in this pursuit.

Audrey comes to us from Burbank, California (though born and raised in Milwaukee). She has taught high school mathematics for thirty years, fourteen of those years using animation. She is the sole author of "Calculus In Motion" and "Algebra In Motion", which she originally wrote for her own classroom students. Geometer's Sketchpad entered her teaching in 1992 for geometry, but she quickly adapted it to calculus, then the prior algebra classes, and now even elementary mathematics topics. For the past few years, Audrey has enjoyed leading professional development workshops across the United States and abroad, including Canada, Australia, and Thailand.

In addition to the opportunity to hear and see what promises to be a very enriching and entertaining presentation, several events will be taking place throughout the evening:

1) Fountain Blue will be providing complimentary appetizers.
2) Key Curriculum Press and Texas Instruments will be providing a number of items to be given away.
3) Our annual scholarships, awarded to high school seniors who plan to teach mathematics, will be awarded. Texas Instruments is sponsoring the meals for the three winners and their parents.

A big thanks to Fountain Blue, Key Curriculum Press and Texas Instruments for their contributions this evening.

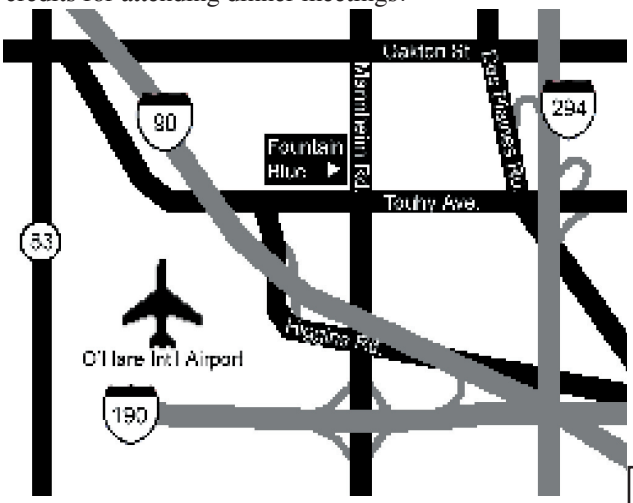
Come on out to our last meeting of this school year and enjoy a wonderful dinner, a great presentation, salute our scholarship winners and maybe even win a valuable prize!

Note: Our entrée tonight will be beef tenderloin brochette.

REMEMBER!! You can earn **CPDU** credits for attending dinner meetings!

Date: Friday, May 11, 2007
Time: 5:30 p.m. Doors Open
6:00 p.m. Social Hour
7:00 p.m. Dinner and Talk
Place: Fountain Blue Banquets & Convention Center
2300 Mannheim Rd.
Des Plaines, IL
(847) 298-3636
Cost: Members $31
Nonmembers $37

RESERVATION DEADLINE
Monday, May 7th, by noon, please!
TO RESERVE:
Call Evanston Math Department at (847) 424-7600 or
email: reservations@mmcchicago.org
Requests for special meals *must* be made in advance.



From Southbound I-294 & Eastbound I-290:
Exit at I-190 West to O'Hare; Exit onto North Mannheim Rd.; Take Mannheim Rd. North 2.25 miles.
From Northbound I-294:
Exit at West Touhy Ave.; Take Touhy Ave. to Mannheim Rd.; Turn right on Mannheim Rd.
Public Transit:
Take the CTA Blue Line to the Rosemont Bus Terminal; Take Pace Bus #223; Exit at Touhy Ave. & Lee Rd.; Walk East on Touhy to Mannheim Rd.

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Points From the Interior of the Angle

by Rich Rukin

This is my last column of Points from the Interior of the Angle. I want to use it to say a few last things.

First, I need to say lots of thank yous. MMC could not operate without the hard work of a large number of people. I'd like to single out a few.

Conrad Wayne, as President-Elect, does most of the work of making each meeting happen; everything from dealing with reservations, meeting arrangements with Fountain Blue, making sure all speaker needs are met, and at the same time preparing next year's program.

Every meeting, when you check in, you see Mary Wiltjer and Ron Vavrinek checking people in. Ron is our treasurer and does an outstanding job. Mary is the membership chair and she keeps us all informed about meetings. Also, Mary and Carol Nenne ran another incredible conference in January.

The other Board members are involved in working on the scholarships, Points and Angles, writing up talks, working with NCTM and ICTM, and innumerable other jobs.

Finally, Ilene Hamilton did an outstanding job of relations with other organizations. She is the one who helped get us hors d'oeuvres at the meetings and arranging door prizes for the May meeting.

Try to thank all these people for their work in making MMC happen.

Finally, I want to thank all our members who attend meetings and workshops. People from the rest of the country can't believe what we do. They don't believe people come out on Friday night to be professionally active. This is what makes us special; the members care about their jobs. I hope that we can continue to increase our attendance for the meetings; also, it's a great way to network with other math teachers. I hope I'll see everyone at the May meeting and next year.

It's been an honor to be the president of MMC [affiliate number 1 of NCTM] for MMC's 94th year. In six year we will celebrate a century. That's an amazing feat.

If you can, get involved. We are always in need of people to be on the Board, to help with the conference, and to help write up talks. Get involved.

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The Locus Construction and Derivation of Polar Equations

Gene Olmstead

BY JOHN DIEHL

Attendees at the April meeting of MMC were treated to an excellent presentation about polar curves. Gene Olmstead, mathematics teacher and Teachers Teaching with Technology Instructor from Elmira, New York, was our speaker. The focus of the presentation was the connection between polar curves and basic right triangle trigonometry.

Gene began by reviewing the locus concept. He first constructed a circle, a radius, and the midpoint of the radius. He posed the question: what is the locus of point created by the midpoint, as the endpoint of the radius moves around the circle? The result, another circle was easily seen on Cabri Jr. on a TI-84.
The second example was to construct the locus of points equidistant from a line and a fixed point not on the line. Thus we saw the parabola constructed from the definition.

Next, Gene reviewed the polar coordinate system. He motivated the idea by posing a scenario, where a second person is trying to describe how another person might find a buried treasure. A direct path, using an angle for direction, seemed like a better idea than an "east-then north" approach. He plotted the circle $r = 3$ and the spiral $r = \theta$.

For the first major construction, Gene used the new TI-Nspire. He constructed a circle, then two more circles with centers on the original center. A right triangle was constructed by drawing two radii of the original circle to specific points, and a perpendicular from one to the other. This construction resulted in a locus of points known as the four-leaved rose. The great connection was to observe the right triangle yielded the equation $\cos(2\theta) = r/a$. The locus curve, the familiar equation, and the right triangle trigonometry were all connected. Gene posed a set of "what if" questions. Suppose there were more circles? We saw curves with different numbers of leaves. He also showed spirals such as $r = k\theta^2$.

Gene continued to make connections between trigonometry and polar curves by constructing cardioids and looking at the values of certain measures. Depending on the measures we saw cusps or inner loops, ultimately generalizing the form of $r = a+b\cos(\theta)$. As the grand finale, the cardioid construction was related to ellipses and hyperbolas also.

The connections, constructions, the images, and the new technology were all more impressive than this text can describe. It was a terrific set of images that helped us see fascinating connection between two familiar topics.

MMC Membership and Change of Address Form

Mail to: MMC
415 S. Ridgeland Ave. #2
Oak Park, IL 60302

Make check payable to MMC.

Please use a different form for each person.

Name _____

Address ☐ _____

_____

Phone _____

School _____

Address ☐ _____

_____

Phone _____

E-Mail _____

Check preferred mailing address above.

☐ **Change of Address**

Membership: ☐ New ☐ Renewal

Choose one:

☐ 1 year	($20)	_____
☐ 2 year	($35)	_____
☐ 3 year	($50)	_____
☐ 1st year teacher ☐ retired ☐ student	($10)	_____

Donations:

Scholarship Fund _____

Speaker Fund _____

Total amount of check: _____

NOTICES & REMINDERS

USACAS 2007
(2) CAS OR NOT(2)CAS

ATTEND the 4th USACAS Conference, 16-17 June, 2007, Aurora (approximately 40 miles west of Chicago), Illinois, USA

Computer algebra systems (CAS) have the potential to revolutionize mathematics education at the secondary level. They do for algebra & calculus what calculators do for arithmetic: simplifying expressions, solving equations, factoring, taking derivatives, and much more!

WHEN: Saturday, June 16, 2007 8:15a.m.—4:15p.m.
Sunday, June 17, 2007 8:00a.m.—1:00p.m.
WHERE: Illinois Mathematics and Science Academy
1500 Sullivan Road, Aurora, Illinois 60506
COST: Registration: $195 (before May 1)
$250 (after May 1)
HOW: Registration, updates, and hotel and transportation information is available online at www.meecas.org

HTTP://WWW.MMCCHICAGO.ORG/

Old issues of POINTS AND ANGLES, summaries of talks given at MMC meetings, the MMC Scholarship application, job openings and people looking for jobs, and more!

TI-Nspire Summer Institute

June 26, 27, 28
9:00 A.M. – 4:00 P.M.

Glenbrook North High School
Northbrook, Illinois

For More Information Contact:
rlevine-wissing@glenbrook.k12.il.us or
rklein9019@aol.com

If you would like a notice or reminder to appear in **POINTS AND ANGLES**, please email the text you would like to appear to *kristenclegg@comcast.net* no later than the date of the MMC meeting preceding the issue in which you would like it to appear. All notices are subject to editing.

Your membership renewal date appears in the upper right corner of the label.

MAILING LABEL

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