St. Olaf Mathematics Department

Math Mess

Department of Mathematics
St. Olaf College
Northfield, MN 55057

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This Week's Mathematics Colloquium

Title: A Piece of Pi
Speakers: ? , David Molnar, and You
Time: Tuesday, March 10, 1:30 pm
Place: SC 182

This Week's Colloquium

There will be no official colloquium talk this week. Instead, we will start celebrating Pi Day a few days early in preparation for the official festivities this Friday (see the following article). Everyone—students and faculty alike—is invited to share some "pi" with the rest of us: songs, poems, factoids, etc. related to pi (or pie) are all welcome. Rumor has it that the famous film mogul David Molnar will show a pi film as part of the proceedings. Of course, there will be lots of **pie** for eating, as well. Don't miss out on this pile of fun; bring your friends or enemies or anyone who wants to party with pi!

The Pi Song

The infamous **Luke Anderson '02** returns to campus for an encore performance of the Pi song. Luke's song, which has a melody based on the digits of pi, has in the past graced the St. Olaf math recital stage as well as previous Pi Day colloquia. This year Luke's musical influence will spread further than ever: he's performing in the Kings Room Complex to a general St. Olaf audience! This Pi event is officially under the auspices of Women's History Month. Come at 3:00 pm on Friday, March 14, to hear Luke's transcendental melody echoing through the Kings Room! Note that plenty of pie will be served!

Throw Pi at the Profs

Thanks to the MAA, on Pi Day every math student's dream will come true. After Luke finishes his Pi performance, the math community will gather on Buntrock plaza to throw cream pies at the math professors! For a paltry sum, you will have the opportunity to smack **Professors Molnar, Richey, McKelvey, Zorn**, and **(Doreen) Hamilton** with loads of whipped cream. All proceeds go to the food bank, so you need not feel guilty about wasting money on something so silly as pie throwing. The cost of throwing a pie will start at $1, and the prices go up slightly if you want to launch the pie from a closer distance. Come to Buntrock Plaza at 4:30 pm on March 14! Show the professors how you feel about that B+!

Departmental Distinction

We encourage anyone who is interested in applying for distinction in mathematics to stop by Donna's office and pick up a form. The process is pretty painless. You just need to fill out the form, which doesn't take too long, and ask two faculty members to write for you. (All professors will be happy to do so.) Applications are due by Friday, April 11.

Jingle Bell Pi

In many parts of the country Pi Day brings spring flowers and warmer weather. But in Minnesota March 14 quite often feels like the middle of winter. So it is perfectly appropriate to sing a winter-related song for Pi Day:

(To the tune of "Jingle Bells")
Verse:
Circles in the snow,
Around and round we go.
How far did we run?
Diameter times pi.

Bells on each digit
Would be irrational
For not even Luke could play a song
On a sequence uncountable.

Refrain:
Oh, Pi Day songs, all day long
So transcendental it is,
To sing a jolly Pi Day song
On a spherical world like this. *(Repeat)*

(Adapted from http://www.geocities.com/SiliconValley/Pines/5945/song.html.)

Last Week's Problem

Prove $n! < \left(\frac{n+1}{2}\right)^n$ for all integers $n > 1$.

We received four very different solutions, from **Adam McDougall '05, Kyle Manley '06, Nick Larson '05,** and **Jason Saccomano '05**. The most direct approach is to use the arithmetic-geometric mean inequality. Kyle reminds us that "the sum of numbers 1 through n is equal to $\frac{n(n+1)}{2}$ as shown by Gauss". This yields $(1 \cdot 2 \cdot \ldots \cdot n)^{1/n} < \frac{n+1}{2}$, where the left side is the geometric mean and the right side is the arithmetic. All that remains is to take the nth power of both sides.

Problem of the Week

In colloquium last week, Tom Sibley asked, "if you want to draw an array of n hexagons (representing a wasp's nest), what is the smallest possible number of line segments (walls) necessary?" If n is in the sequence 1, 7, 19, 37, 61, ... this smallest number is given exactly by the formula $w(n) = 3n - \sqrt{12n - 3}$. Amazingly, if n is not one of these numbers, the same formula works, as long as you round the result up to the next highest integer. Your problem is to show that those values of n, which can be given as $n = 3k^2 - 3k + 1$ for k=1,2,3,... are in fact the only values of n for which Tom's formula yields an integer.

** Please submit all solutions to David Molnar (molnar@stolaf.edu) by noon on Sunday.

If you would like to receive a copy of the Math Mess in your P.O. Box weekly, please e-mail Donna Brakke at brakke@stolaf.edu.

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