Friday Night Flicks

This week, come see “Breaking the Code” the 1996 TV biography of mathematician Alan Turing, one of the inventors of the digital computer, and a major player in the breaking of the German’s Enigma code during WWII.

Be there 7:30-9:30 p.m. CMC 206. Russ’ll provide the popcorn.

MAA Newsletter

Stay up to date on your mathematical news with the MAA Student Newsletter. This is a useful online source for information on national meetings and other opportunities to pursue mathematics through the MAA. This is a great way to look at up-coming meetings, and to read about the events of last year’s meetings to find out if attending a national meeting is something you might be interested in. Check them out at: http://www.maa.org/students/CUSAC/

Got Gnarly?

For your reading pleasure, check out the Gnarly Gnews, the “free, humorous bi-monthly math newsletter.” What could be better? The current issue features the Monte Carlo Method. Intrigued? Go to: http://www.gnarlymath.com/news/gnews1_1.html

Student Writing Contest

Do you enjoy writing and love mathematics? The History of Mathematics Special Interest Group of the MAA (HOM SIGMAA) has a Student Paper Contest in the History of Mathematics. The deadline for submission is March 31, 2009. Get more information at www.homsigmaa.org

Click this!
More Math, More Music

Last week we featured the mathematics behind music from the use of math to analyze the Beatles, to mathematicians constructing a road that when driven over, at 55 mph, sounds like the William Tell Overture. This week we’re finding even more math in music, and music in math. Click this, for your listening pleasure: go to youtube.com and search: UTby_e4-Rhg

Still not convinced about the musical road? Find videos of the one in Lancaster, CA that we featured last week, and others, like the one in Anyang, Korea, on youtube.com. Search: 30StTQAUPtg or yTsP3WWgU4
Ladies, Road Trip!

Want to spend a weekend with fellow Carls listening to hear undergraduate women give talks about their own research? The 11th Annual Nebraska Conference for Undergraduate Women in Mathematics is coming up! The registration deadline this year is December 12. Contact Deanna if you are interested.

Opportunities for Carls

What are you doing this summer? Over winter break? Next year? After you graduate? Don’t stress out, now is a great time to start exploring your opportunities. Here are a few to consider:

Check out the Program for Women and Mathematics at the Institute for Advanced Study and Princeton University. This is a great opportunity to delve deeper into Geometric PDEs. The program is open to undergraduate and graduate students. For application information see the poster in the second floor hallway of the CMC, or go online at: www.math/ias.edu/wam

The Institute for Pure and Applied Mathematics is hosting a series of talks on the quantitative and computational aspects of metric geometry. The talks will be held in Los Angeles, CA, January 12-16.

Also at the Institute for Pure and Applied Mathematics, a series of lectures, tutorials, and workshops revolving around numerical approaches to quantum many-body systems. Among the goals of this program is to bring together students across disciplines, from physics, chemistry and math. The program, also in Los Angeles, CA runs January 22-30. For more information about both of these, and a handful of other programs hosted by IPAM, go to: www.ipam.ucla.edu/programs

PROBLEMS OF THE WEEK

1. Let $g$ be a continuous function defined on the positive real numbers. Define a sequence $(f_n)$ of functions as follows:
   
   $$f_0(x) = 1; \quad \text{for } n \geq 0 \text{ and } x > 0,$$
   
   $$f_{n+1}(x) = \int_1^x f_n(t)g(t)dt.$$
   
   Suppose that for all $x > 0$,
   
   $$\sum_{n=0}^{\infty} f_n(x) = x.$$ 
   
   Find the function $g$.

2. If $n$ points in the plane are such that all the distances between them are equal, it’s easy to see that $n$ can be at most 3 (if $n = 3$, the points must form an equilateral triangle). Now suppose that $n$ points in the plane are such that there are just two different distances between them, that is, there are two numbers $a$ and $b$ such that whenever we choose any two of the $n$ points, their distance to each other will be either $a$ or $b$. What is the largest possible value of $n$? Show why your answer is correct.

By press time, a substantial effort on last week’s second problem had come in from “L. C. Badice”, who did a nice job of pattern finding to conjecture the correct answer. Can (s)he also find a proof that the pattern persists? Maybe the next Gazette will bring the answer. Actually, by the time the next Gazette appears it will be January, and by then my own solutions to all the problems posed this term should be posted. Solutions that arrive in the meantime will be acknowledged in that issue. Good luck on finals etc., and have a great break!

- Mark Krusemeyer

Editors: Deanna Haunsparger Beatrice White
Problems of the Week: Mark Krusemeyer
Subscriptions & Web: Sue Jandro