L'Augarithms

vol. 25.09 Visit us at <augsburg.edu/home/math/forStudents.html> We're prettier in color. Really. March 7, 2012

Mathematics Colloquium Spring Lineup

Colloquia are typically held Wednesdays 3:40—4:40 in Oren 113. Immensely appealing refreshments are served.

Jan.	18	Chandra Erdman, '02, Ph.D., US Census Bureau
Feb.	1	Ken Kaminsky, Augsburg College
	15	Loren Larson, Northfield, Minnesota
	22	Sadie Dietrich, University of Minnesota
Mar. →	7	Karen Saxe, Macalester College[1]
Apr.	4	Thomas Sibley, St. John's University
	18	Danrun Huang, St. Cloud State University

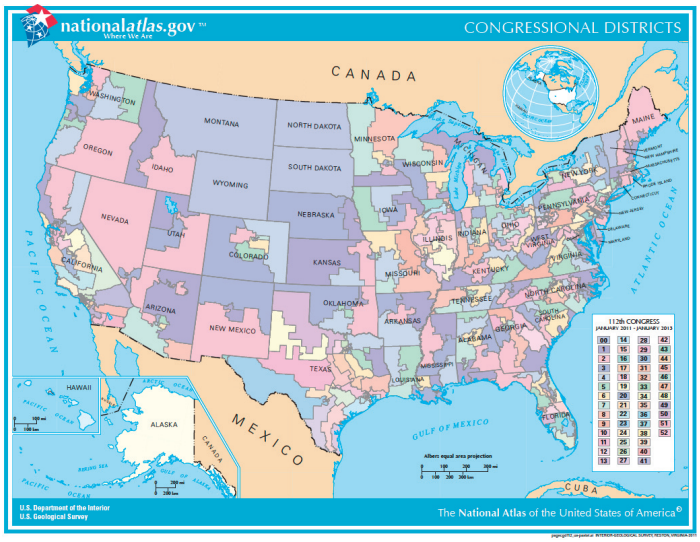
[1]This week's speaker

Karen Saxe, Macalseter College

A Mathematical Adventure through the Census, Reapportionment, and Redistricting

Karen Saxe

This talk will run through the basics of congressional reapportionment and redistricting, as they are done in the United States. Similar mathematical processes are used in other democracies around the world to determine the constitution of parliaments. Everyone is welcome, no math or political science background necessary.



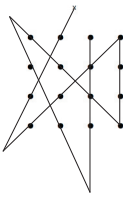
Problem of the week...

Augsburg's **Anika Clark** solved the POTW from vol 25.08. She found the 292 ways to make change for a dollar bill using pennies, nickels, dimes, quarters, and half-dollars.

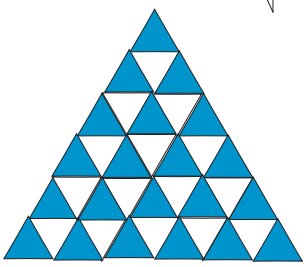
Professor Fogelfroe often assigns eight homework problems per day and randomly selects one of them to grade. With as few rolls as possible, how can he use one fair six-sided die to select a number uniformly distributed between one and eight? (A uniform selection is one for which all eight outcomes are equally likely.)

❖ Reprinted with permission from Bradley U's old 'POTW' page <http://hilltop.bradley.edu/%7Edelgado/potw/potw.html>

Puzzle of the week...



Wileam McHickershire solved the PZOTW from vol 25.08. →



Here is a new PZOTW:

How many triangles can be counted in the figure on the right? Before you start counting, you should know that the number is greater than 50.

❖Submit POTW & POZTW solutions to kaminsky@augsburg.edu, or under Ken's door at SCI 137E, or in the puzzles and problems box just outside of Su's office.

L'Augarithms
The approximately bi-weekly newsletter
of the
Department of Mathematics
at Augsburg College
Editor.....Kenneth Kaminsky
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Tidbits of the Week (TOTW)

$111111111^2 = 12345678987654321$?

11^2 in base 10 is 11111 in base 3.

If you Google 'binary,' you will find that there are about 0b10000100110000000110000000 results.

If you Google 'octal,' you will find that there are about 0o5561540 results.

primorial(*p*), written *p*#, defined for primes, is the product of all of the primes up to and including *p*. *Examples*:
19# = 2x3x7x11x13x17x19 = 9,699,690;
31# = 2x3x7x11x13x17x19x23x29x31 =200,560,490,130

In Mark Haddon's wonderful book, *The Curious Incident of the Dog in the Night-Time*, the narrator, a 15 year-old autistic boy, numbers its fifty-one chapters with consecutive primes: 2, 3, 5, ..., 233.

The Konhauser ProblemFest XX

On Saturday, February 25, three teams of Augsburg students traveled to Macalester College to participate in the 20th Konhauser Problemfest, a team mathematics competition of regional colleges. The three teams of three students each-the most ever that Augsburg has sent to the competition-vanquished challenging mathematical problems on the three-hour, ten-question exam. The team participants were **Carl Benson**, **Will Gubash**, **Joe Rossetter**, **Ryan Mulcahy**, **Megan Sutherland**, **Jasmine Zand**, **HeeChan Kang**, **Kaleb Saindon**, and **Austin Wagner**. Past competition problems can be viewed at http://www.macalester.edu/academics/mscs/competitions/konhauserproblemfest.html.

Born on this day, March 7, in 1893—Anna Mullikin

Anna Mullikin was born in Baltimore, Maryland. She attended Goucher College, which was then a women's college located in Baltimore. While there she managed her class basketball team, participated on the swimming team, and earned her A.B. degree in 1915. That same year her name was mentioned in the American Mathematical Monthly [Vol. 22, No. 5 (May 1915),pp. 165-166] for solving the following geometry problem:

A quadrilateral of any shape whatever is divided by a transversal into two quadrilaterals. The diagonals of the original figure and those of the two resulting (smaller) figures are then drawn. Show that their three points of intersection are collinear.

The published solution was by Vola Barton, also from Goucher, with the remark "Also solved by Anna Mullikin."

After graduating from Goucher, Mullikin taught mathematics at the Science Hill School in Kentucky (a private prep school for girls) for two years, and at the Mary Baldwin Seminary in Virginia (at that time a women's junior college, later to become Mary Baldwin College in 1923) for one year. In 1918 she entered the graduate program in mathematics at the University of Pennsylvania, earning her master's degree in 1919. She continued her graduate studies at Penn during the 1919-1920 academic year under the direction of the topologist, Robert L. Moore, while also teaching at the Stevens School in Germantown, Pennsylvania, another private preparatory school for girls. In the fall of 1920 she moved to the University of Texas along with Moore, who had convinced the Texas math department to appoint her as an instructor. Mullikin stayed in Texas for only the one academic year before returning to Philadelphia to complete the requirements for her degree from the University of Pennsylvania, with Moore still as her advisor. She received her Ph.D. in mathematics in 1922 with a dissertation on "Certain theorems relating to plane connected point sets." She was the third of Moore's 50 graduate students (another was Mary Ellen Rudin). Her thesis was published in the *Transactions of the American Mathematical Society* [Abstract]. An extensive analysis of the mathematical content of this important work in point-set topology and its influence on future research in topology can be found in the paper by Thomas Bartlow and David Zitarelli.

Mullikin did not pursue mathematical research after earning her Ph.D, spending the rest of her professional career as a high school mathematics teacher, first at William Penn High School for Girls in Philadelphia for one year, and then at Germantown High School where she remained until retiring in 1959. She was appointed head of the mathematics department in 1952. In 1956 she was a joint author with Ethel and Ewart Grove for the textbook *Algebra and Its Use, Book 1* [Table of Contents] and Book 2 [Table of Contents], and in 1961 the three authors published *Basic Mathematics* [Table of Contents]. While Mullikin herself may not have continued original mathematical research, by all indications she was a caring and enthusiastic teacher who inspired some of her students to pursue advanced work in mathematics and computer science. One such student was Mary-Elizabeth Hamstrom (1927-2009) who earned her Ph.D. in mathematics from the University of Texas in 1952, also with R.L. Moore as her advisor, and who was a topologist at the University of Illinois for 38 years.

Anna Mullikin died on August 24, 1975, at the age of 82.

References

1. Bartlow, T.L., and D.E. Zitarelli. "Who was Miss Mullikin?", American Mathematical Monthly, Vol. 116 (February 2009), 99-114. [pdf version or online version from MAA website]
2. Green, Judy and Jeanne LaDuke, Supplementary Material for *Pioneering Women in American Mathematics: The Pre-1940 PhDs*, American Mathematical Society, 2009.
3. Peterson, Ivars. "The Remarkable Miss Mullikin", The Mathematical Tourist, February 20, 2009 (MAA Online) [The second sentence is now out of date!]
4. Mathematics Genealogy Project