

MSCS



Mess

Department of Mathematics, Statistics and Computer Science
St. Olaf College
Northfield, MN 55057

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This Week's Colloquium

Title:	Geometry and Islam
Speaker:	Richard Allen
Time:	Tuesday, May 9, 1:30 p.m. (treats at 1:15)
Place:	SC 182

Although the Koran does not explicitly forbid the use human and animal forms in art, the Prophet Muhammad strongly discouraged this practice in the Hadith. This attitude led many Muslim artists of his time to adopt Greek geometry as the mainstay of their art, especially for the geometric patterns, which form the basis of decoration in sacred buildings and monuments of the Islamic world.

In this presentation, Professor Allen will consider why Muslims adopted Greek geometry and what kind of geometry they chose to create their art. For example, what in Islam predisposes a love affair to arise between the circle and the repeat units that form these geometric patterns?

Professor Allen will focus on basics from geometry that underlie the repeat units. One approach is to organize them according to grids. The main grids are based on squares, equilateral triangles/hexagons, and pentagons.

The square roots of 2 and 3 and the Golden Ratio are all elements related to these grids that impressed the Islamic artists. A few pretty pictures will be shown, too.

Problem of the Summer (POS)

Thanks to everyone who submitted answers to the Problems of the Week (POWs) this year! We're leaving you with one last problem, but you have a whole summer to solve this one.

Suppose that the temperature at a particular spot on the west bank of the Mississippi River has been tracked continuously for millennia. Suppose, also, that there is precise agreement between the temperature exactly 2006 years ago and the temperature right now. Between then and now, must there have been a pair of times, exactly one year apart, when the temperatures precisely agreed with each other?

Be sure to prove that your answer is correct.

*** Please submit all solutions to Amelia Taylor sometime before fall, either through e-mail (ataylor@stolaf.edu), by placing them in her box at OMH 201, or by passing them on to Donna Brakke.

POW Acknowledgments

After two years as the MSCS Mess POW editor, Amelia Taylor would like to thank the following sources who have provided or inspired her POWs: Paul Zorn; the Bradley University Problem of the Week at <http://bradley.bradely.edu/~delgado/potw/potw.html>; *The Inquisitive Problem Solver*, by Paul Vaderlind, Richard Guy and Loren Larson; *The Wohascum County Problem Book*, by George T. Gilbert, Mark I. Krusemeyer, and Loren C. Larson; *A friendly Mathematics Competition*, edited by Rick Gillman; and the University of Illinois at Chicago Putnam Newsletter at <http://www.math.uiuc.edu/~hildebr/putnam/newsletter/>.

Last Week's Problem

Is there a number A such that the decimal digits in A^2 add up to 44?

Congratulations to Reid Price '07 for solving this week's problem! What follows is a slightly edited version of Reid's solution.

There is no perfect square such that the sum of its digits is 44. First, note that 10 is $1 \pmod 3$, so 10^n is $1 \pmod 3$ for all n ; thus, $A^2 \pmod 3$ is equal to the sum of its digits $\pmod 3$. Using the division algorithm, write $A = 3q + r$ where r is $0, 1, \text{ or } 2$. Then $A^2 = 9q^2 + 6qr + r^2$, and r^2 is $0, 1, \text{ or } 4$. If we consider $A^2 \pmod 3$, then since $A^2 = 3(3q^2 + 2q) + r^2$ we get that A^2 is congruent to $r^2 \pmod 3$ and r^2 is $0, \text{ or } 1 \pmod 3$. Thus A^2 must be $0 \text{ or } 1 \pmod 3$. However, 44 is $2 \pmod 3$. Thus, the sum of the digits of A^2 cannot be 44 for any A .

Return of the PIG ROAST

You said you wanted a pig, so we got one! The annual pig roast is back by popular demand, and will take place on Sunday, May 14 at 1:00 p.m. Tickets are on sale for \$5 and you can buy them from Donna Brakke in the MSCS department office. Vegetarian options will also be available.

Seniors Awarded Distinction

Congratulations to the following seniors who earned distinction in mathematics, statistics, or computer science!

Mathematics:

Sarah Gilles
Kelly McConville
Will Mitchell
Dan Visscher

Statistics:

Joel Beard
Steff Halberstadt
Haley Hedlin
Mark Holland
Kezia Manlove
Phil Schulte
Stacey Wood

Computer Science:

Bryan Anderson (CS concentrator)
Joel Couenhoven (CS major)

Editor-in-Chief:	Paul Roback
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