The Almagest

The bi-weekly newsletter of the Department of Mathematics and Computer Science. Your trusted source for news.

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Alma College
Alma, MI 48801

Math & C.S. Colloquium

Alma College alumnus **Paul Kassal** is a Senior Software Architect at ProQuest, a company managing one of the largest collections of digital documents in the world. He'll share some highlights about the projects he's worked on such as mining data from unstructured text, automatic summarization, document clustering and DNA analysis. In addition, he'll talk about architecting large-scale systems and the life of a software engineer.

"Mapping Oceans of Digitized Knowledge: From Text Mining to Inverted Indexes"

Presenter: Paul Kassal
Date: **Monday, December 6th**
Time: 4:00
Place: SAC 216

Refreshments at 3:50.

Looking for a Math Teaching Position?

The Southern Teaching Agency is the oldest teacher placement agency in the U.S. It provides FREE teacher placement service that can help you find a teaching position in a private/independent school in Maryland, South Carolina, North Carolina, Georgia, Florida, Tennessee, Virginia, Texas, Louisiana, and Alabama. For more information about the STA, visit www.SouthernTeachers.com .

Juniors: Time to think about an REU

Have you ever thought about going to graduate school to study in mathematics or computer science? Would you like to "test the water" and see if grad school might be the right thing for you? If you're a *junior* wrestling with these questions, then please consider applying for a summer REU (Research Experience for Undergraduates). This is a great opportunity to spend 7 or 8 weeks of the summer working on some interesting project in mathematics or computer science. And to make it even more attractive, you'll receive a stipend of approximately **$2500** in addition to free room and board. There are numerous REU's dealing with a wide variety of topics. Please check out the topics and deadlines for applying at the following website: www.ams.org/employment/reu.html

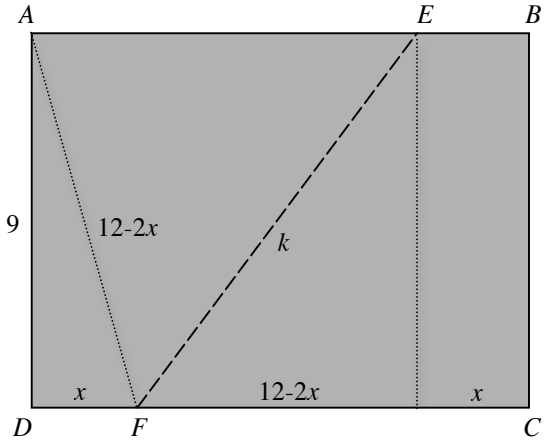
Perfect Shuffles

Suppose you have a standard deck of 52 cards. If you perform a random riffle shuffle 7 times, it would be pretty safe to say that your deck of cards is 100% random. However, what if those shuffles were perfect shuffles? A perfect shuffle involves cutting the deck precisely in half (26 cards in each hand) and laying 1 card down after another alternating hands for each card. Obviously, this is not random because it is possible to find a card's new position. With this kind of shuffle, there are 2 possible

outcomes; one involving the original top card staying on top (an out-shuffle), the other involving the original top card becoming the second card (an in-shuffle). As it turns out, if one performs 8 out-shuffles, the deck will not have deviated from its initial configuration. If you can master perfect shuffling, you can impress your friends with an interesting trick. Consider the top card to be in position 0. You can move it to any position N in the deck by shuffling. Convert N into base 2. If 0, do an out-shuffle; and if 1, do an in-shuffle. So, to get the top card to the 10th position, 10 is 1010 in base 2. You would shuffle in, out, in, out. For more information, visit the website: http://www.math.hmc.edu/funfacts/ffiles/20001.1-6.shtml S^2

Solution to Previous Puzzle

A 9-inch by 12-inch sheet of paper, which we'll denote by $ABCD$, is folded so that the corner points A and C coincide. This produces the line segment (crease) EF. Without the aid of any measuring device, find the length of EF.



Dan Seals submitted a solution to the puzzle within hours of its posting. He created two right triangles, and then used the Pythagorean Theorem. Using $9^2 + x^2 = (12 - 2x)^2$ and $9^2 + (12 - 2x)^2 = k^2$, he found $k = 11.25$.

MATH Challenge Results

There were 66 teams from 28 different colleges that competed in this year's MATH Challenge. The Alma College team of **Ryan Spitler**, **Alex Hegedus**, and **Matt Mansell** came in ninth. *Congratulations gentlemen*!

Puzzle of the Bi-week

All of the students in a class of 40 math students stand in a 5 × 8 rectangular formation, with 8 columns and 5 rows. In each column the tallest student is noted, and it turns out that the *shortest* of these 8 students is **Allen**. From each row, the shortest student is noted and it turns out that the *tallest* of these five students is **Ben**. Who is taller, **Allen** or **Ben**, or is it impossible to tell? Please justify your answer.

Student assistants: Matt Mansell = M^2
Stephen Sorensen = S^2
Distribution: Deb Smith
Faculty advisor: Tim Sipka

If you would like to submit an announcement or a short article, please send it via e-mail to Matt Mansell (11mgmans) or Tim Sipka (sipka).