

The Almagest

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

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March 21, 2016

Alma College
Alma, MI 48801

Senior Presentations

Senior presentations will continue over the next several weeks. All talks are in **SAC 113** with the first talk beginning at **4:00** and the second talk beginning at **4:30**. Please come and support your classmates. Refreshments are provided.

Monday, March 21st

Jace Buell: *Data Encryption*

Allison Smith: *The Art Gallery Problem*

Tuesday, March 22nd

Jamey Paron: *The Monty Hall Problem*

Lillie Miller: *Game Theory*

Thursday, March 24th

Jeremy Weber: *An Introduction to Fourier Series*

Jason McKelvey: *Scheduling Problems in Graph Theory and Combinatorics*

Monday, March 28th

Mason Molesky: *L'Hospital's Rule*

Andrew Kenger: *Data Mining & Its Applications*

Tuesday, March 29th

Will Germain: *Three Cards Suffice*

Austin Bryan: *Instant Insanity*

Thursday, March 31st

Krystle Reiss: *The Law of Truly Large Numbers*

Joe Espie: *Neural Networks*

The Math Club

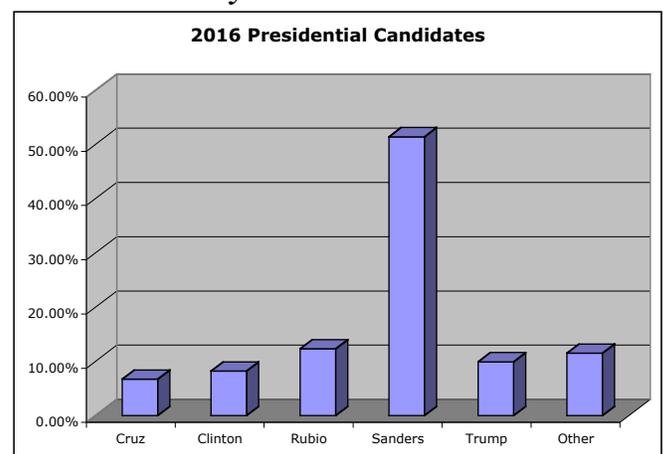
The Math Club will be electing officers at its meeting on **Tuesday** at 9:00 pm in Dow 132.

Math 380: Stochastic Processes

Please consider registering for a new course offered in the fall. It's MTH 380 (Stochastic Processes), taught by Dr. Brad Westgate. A *stochastic process* is a model of how a random system changes over time. For example, the daily prices of a stock and the number of customers in line at a coffee shop are stochastic processes. This course will cover the theory of stochastic processes, including Markov chains, queuing theory, the Poisson process, and Brownian motion, and also applications, including models of DNA sequences, call centers, and the Black-Scholes option pricing formula. The prerequisite is MTH 210. Math teaching majors and minors may take MTH 380 as a substitute for MTH 341.

Students Select Sanders

One week before the Michigan primary, students in Math 116 (Elementary Statistics) interviewed 416 Alma College students asking them: *If the election for president were held today, which candidate would you select?* Here are the results.



FYI: The survey also found that approximately **26.7%** of Alma College students have a tattoo.

Math Anxiety

Math anxiety is defined as “the panic, helplessness, paralysis, and mental disorganization that arises among some people when they are required to solve a mathematical problem” (Bohrod, et al.). This is a problem that plagues math students of all ages and levels. It can affect students from math majors in upper level classes, to non-majors who just want to get their distributive requirements done. Scientists at the University of Chicago have gained insights into how students can overcome this obstacle. They have learned that success in math with these students is not really about math knowledge. Obviously, a student must do the work and learn the material, but performing well on a mathematics exam involves more than that. It appears that overcoming this anxiety is about telling yourself to just get it done. In brain scans, they discovered that by mentally preparing yourself to buckle down and work before an exam can help curb the anxiety during the exam.

Math faculty at Weber State University have put together a document with information on math anxiety. It includes a quiz to determine if you potentially have math anxiety and tips and tricks on how to overcome it. You can find the document at <http://www.weber.edu/wsuiimages/vetsupwardbound/StudySkills/overcomemathanxiety.pdf>. It has great advice on how to study math, how to take a math test, and general thoughts for those who struggle with math anxiety. If you are someone who has ever frozen on a math test, and I’m willing to bet that’s almost everyone, feel free to check this link out. Also, those of you who hope to become math teachers may find some of the ideas of these professors helpful in your classrooms. Good luck to all of you! *Christine Wiersma*

Solution to the Previous Puzzle

Let $f(x) = ax^2 + bx + c$, where a , b , and c are *integers*. Now, suppose $f(1) = 0$, $40 < f(6) < 50$, and $60 < f(7) < 70$. The question: What is $f(8)$?

Jason McKelvey won the \$5 prize. We know, $40 < 36a + 6b + c < 50$, $60 < 49a + 7b + c < 70$, and $a + b + c = 0$. Adding $4a + 4b + 4c$ to the first inequality, we get $40 < 40a + 10b + 5c < 50$. Dividing by 5, we get $8 < 8a + 2b + c < 10$, which implies $8a + 2b + c = 9$. Subtracting $a + b + c$ from the

second inequality, we get $60 < 48a + 6b < 70$. Dividing by 6 allows us to say $8a + b = 11$. With a little more work, you’ll discover $f(8) = 91$.

Puzzle of the Bi-week

The mean, median, range, and *unique* mode of a collection of ten integers are all equal to 10. What is the **largest integer** that can be an element of this collection? Please provide a convincing argument for your answer.

Suppose the ten integers are represented as:

$$x_1 \leq x_2 \leq x_3 \leq x_4 \leq x_5 \leq x_6 \leq x_7 \leq x_8 \leq x_9 \leq x_{10}.$$

Then recall:

$$\text{mean} = \frac{x_1 + x_2 + x_3 + \dots + x_{10}}{10}$$

$$\text{median} = \frac{x_5 + x_6}{2} \quad (\text{the middle value})$$

$$\text{range} = x_{10} - x_1$$

$$\text{mode} = \text{the value that occurs most often}$$

A prize of **\$5.00** will be awarded to the 1st student who submits a correct solution to Prof. Sipka.

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Distribution: Deb Smith

If you would like to submit an announcement or a short article, please send it via e-mail to Tim Sipka (sipka@alma.edu).