Augarithms

AUGSBURG COLLEGE

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Mathematics Colloquium Spring Lineup

Colloquia are typically held Wednesdays from 3:40—4:40 in Science Hall 108. Refreshments are always provided.

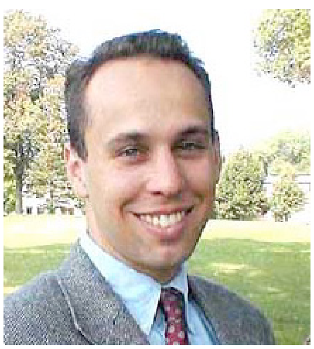
Jan.	24	Aaron Luttman, Bethany Lutheran College
Mar. →	7	William Cooper, University of Minnesota[1]
Mar.	28	Adam Roesch, Ing Group
Apr.	4	Corey Nathe, Lava K. C., Augsburg College
Apr.	18	Daniel Kaplan, Macalester University

A number of additional colloquia will be added. Please stand by.

[1]This week's speaker: William Cooper

How Do Airlines Set Ticket Prices?

An Introduction to Revenue Management



William Cooper

The term "revenue management" refers to a broad collection of quantitative approaches, grounded in operations research and mathematical modeling, for dynamically controlling prices and availability of products that are comprised of limited perishable resources. Perhaps the best known application is in the airline industry, where the products are tickets, the resources are seats on flights, and the objective is to maximize expected revenue from the sale of tickets. In this talk I will give an overview of revenue management, including descriptions of both application areas and underlying methodologies.

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The bi-weekly newsletter of the
Department of Mathematics
at Augsburg College

Editor-in-chief.......Ken Kaminsky
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Problem of the week...[2]

We have two solvers of the problem of the week from January 24. They are **Michael Janas**, and **Jerry Eddy**. They found that the elevation at which the parabolic curve meets the 3% grade line was 1,240 feet. The drain should be located at the point (625, 1234) (assuming the origin is at sea level, directly below the point where the 5% grade meets the parabola. Here is this week's problem:

Two ferry boats sail back and forth across a river, each traveling at a constant speed, and turning back without any loss of time. They leave opposite shores at the same instant, pass for the first time 700 feet from one shore, continue on their way to the banks, return and pass for the second time 400 feet from the opposite shore. What is the width of the river?

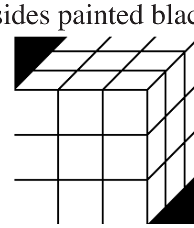
[2]Reprinted with permission from Bradley U's 'potw' page <bradley.bradley.edu/~delgado/>

Puzzle of the week...

With reference to the puzzle of January 24, **Richard Garnett**, **Michael Janas**, and **Nick Swanson** found that Ed was probably going 55 mph. And here is this week's puzzle:

A wooden cube is painted black on the outside. Suppose it is divided with six equal cuts into the smaller cubes shown.

1. How many smaller cubes are there?
2. How many of these smaller cubes
   - *a*) have only one side painted black?
   - *b*) have two sides painted black?
   - *c*) have three sides painted black?
   - *d*) have no sides painted black?



Submit your puzzle and/or problem solutions to the editor at kaminsky@augsburg.edu, slip them under his door at SCI137E, or put them in the puzzles and problems box just outside of Su's office

Famous statisticians: S. S. Wilks*

S. S. Wilks

Born June 17, 1906 in Little Elm, Texas, Samuel Stanley Wilks attended school in Denton; then studied architecture at North Texas State Teachers College. He received a B.A. in architecture in 1926. His eyesight was not too good, and he feared that this would be a handicap if he pursured architecture as a profession so he decided on a career in mathematics.

During session 1926-27 Wilks taught in Austin, Texas and at the same time he began to study mathematics at the University of Texas. Here he was taught advanced mathematics by Robert Moore, taking courses in probability and statistics with E L Dodd. Wilks received an M.A. in mathematics in 1928.

Wilks was awarded a fellowship to the University of Iowa where he studied for his doctorate. Here H L Rietz, who supervised his doctorate, introduced him to Gosset's theory of small samples and R A Fisher's statistical methods. After receiving his doctorate in 1931, on small sample theory of 'matched' groups in educational psychology, he continued research at Columbia University in the 1931-32 academic year.

In 1932 Wilks went to England where he spent a period in Karl Pearson's department in University College. In 1933 he went to Cambridge where he worked with John Wishart, who had been a research assistant to both K Pearson and R A Fisher.

In 1933, Wilks was appointed instructor of mathematics, where he was to remain tere for the rest of his career, being promoted to professor of mathematical statistics in 1944.

Wilks's research centered on mathematical statistics. His early papers on multivariate analysis were his most important, one of most influential being certain generalizations in the analysis of variance. He constructed multivariate generalizations of the correlation ratio and the coefficient of multiple correlation and studied random samples from a normal multivariate population.

Three papers in 1931-33 concerned deriving the sample distributions of estimates of the parameters of a bivariate normal distribution when some of the individuals gave observations on both variables, some others on only one. In 1935 he investigated multinomial distributions. He advanced the work of J Neyman on the theory of confidence-interval estimation. In 1941 Wilks developed his theory of 'tolerance limits'.

Wilks was a founder member of the Institute of Mathematical Statistics (1935). He was editor of the Annals of Mathematical Statistics from 1938 until 1949.

Wilks served the U.S. Government in many roles. Among many other similar tasks, he worked for the U.S. Department of Agriculture and was a member of the National Defense Committee. In 1947 he was awarded the Presidential Certificate of Merit for his contributions to antisubmarine warfare and the solution of convoy problems.

Samuel Wilks died March 7, 1964 in Princeton, New Jersey.

*Reprinted with permission from J J O'Connor and E F Robertson

Some funny answers to math questions

1. Use the example

$$\lim_{x \to 8} \frac{1}{x - 8} = \infty$$

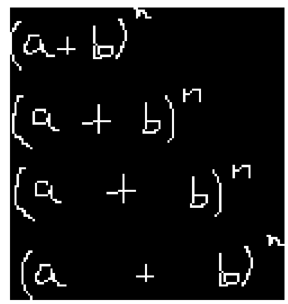
to find

$$\lim_{x \to 5} \frac{1}{x - 5}.$$

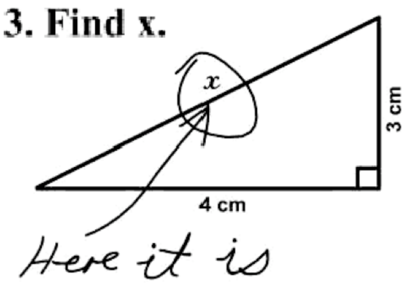
Solution:

$$\lim_{x \to 5} \frac{1}{x - 5} = 5$$

2. Expand $(a + b)^n$



3. Find x.



In honor of π day here are its first 1000 digits

3.1415926535897932384626433832795028841971693993751058209749445923078164062862089986280348253421170679821480865132823066470938446095505822317253594081284811174502841027019385211055596446229489549303819644288109756659334461284756482337867831652712019091456485669234603486104543266482133936072602491412737245870066063155881748815209209628292540917153643678925903600113305305488204665213841469519415116094330572703657595919530921861173819326117931051185480744623799627495673518857527248912279381830119491298336733624406566430860213949463952247371907021798609437027705392171762931767523846748184676694051320005681271452635608277857713427577896091736371787214684409012249534301465495853710507922796892589235420199561121290219608640344181598136297747713099605187072113499999983729780499510597317328160963185950244594553469083026425223082533446850352619311881710100031378387528865875332083814206171776691473035982534904287554687311595628638823537875937519577818577805321712268066130019278766111959092164201 99