Augarithms

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Colloquium Series Dates for Fall 2003

Colloquia are held on Wednesdays from 3:40 to 4:40 p.m. in Science 108. Except for the names of some of the speakers, here is the schedule of dates for the 2003-2004 academic year:

Sept.	24	Dan Wolf, Kailash Thapa, Augsburg College
Oct.	8	Gerrard M. Carlson, Guidant Corporation
Oct.	22	Ioanna Mavrea, Augsburg College
Nov.	5	TBA
Nov.	19	TBA
Dec.	3	TBA

This week's speakers: Kailash Thapa & Dan Wolf

Numerical Methods for Wave Modeling and Parallel Computational Techniques

Kailash Thapa (left) and Dan Wolf

We will be discussing how we used numerical techniques to approximate several different types of wave equations in one, two and three dimensions. In addition we will discuss parallel computing issues including boundary data problems. The point of the project is to allow professor Nick Coult to test his new computational methods for wave propagation against our programs which are currently the standard technique used in wave propagation.

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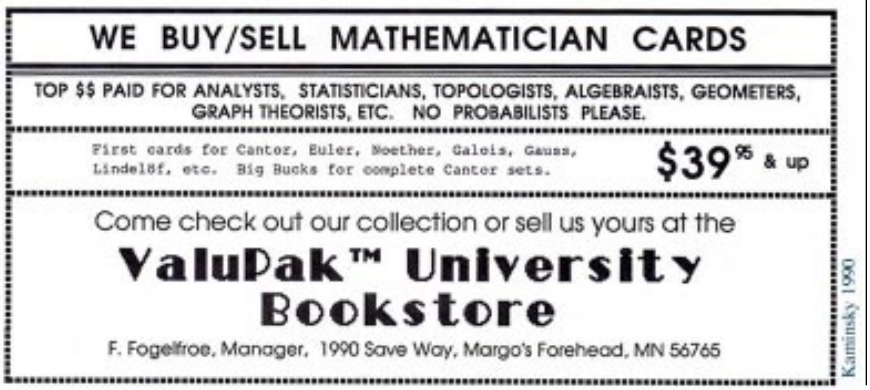

Cramer's Rule†

A method for solving multivariate simultaneous linear equations.

$$a_{11}x_1 + a_{12}x_2 + \ldots + a_{1n}x_n = b_1$$
$$a_{21}x_1 + a_{22}x_2 + \ldots + a_{2n}x_n = b_2$$
$$\vdots$$
$$a_{n1}x_1 + a_{n2}x_2 + \ldots + a_{nn}x_n = b_n$$

where x_i is the ith variable, a_{ij} is the constant coefficient on x_i in the ith equation, and b_i is the constant on the right-hand side of the ith equation. This can be written in matrix notation as $\boldsymbol{AX} = \boldsymbol{b}$, where $\boldsymbol{A}$ is the matrix containing the elements a_{ij}, $\boldsymbol{b}$ is the vector containing the elements b_i; $\boldsymbol{X}$ is the vector of values of the variables x_i. The value of x_k which satisfies the set of simultaneous equations is found by Cramer's rule by replacing the kth column of the matrix $\boldsymbol{A}$ by the vector $\boldsymbol{b}$, forming a new matrix $\boldsymbol{A}_k$. The value of $\boldsymbol{X}_k$ is then the determinant of $\boldsymbol{A}_k$ divided by the determinant of $\boldsymbol{A}$, that is

$$\boldsymbol{X}_k = |\boldsymbol{A}_k| / |\boldsymbol{A}|;\ k = 1, 2, \ldots, n$$

K. A. Fox and T. K. Kaul, *Intermediate Economic Statistics* (Melbourne, Fla, 1980) **PAUL HANNON**

†Reprinted with permission from *Dictionary of Theories*, by Jennifer Bothamley, Visible Ink, Detroit.

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Puzzle & Problem...

Problem of the week:

Last issue's problem: Can there be 1,000,000 consecutive composite numbers?, was solved by **Chrissy Piram**, **Hung Nguyen**, and **Daniel O'Loughlin** of St. Kate's.

Here is this week's problem:

We know that $5^3 = 125$ and $6^3 = 216$. Keeping these facts in mind, and without the use of a computing device, tell how you can find the cube root of 148,877 armed only with the knowledge that it is a perfect cube?

Last issue's puzzle the 15 boxes was solved by **Chrissy Piram**, **Hung Nguyen**, **Ryan Shea**, **Sayra Smith**, **Michael Vang**, **Britta Boyum**, **Greg McKusky**, **Matt Johnson**, **Ellen Waldow**, **Eilidh Reyelts**, **Jen Hook**, **Jolene Jensen**, **Paul Pierson**, **Andrew Held**, **Antonio Spargo**, **Kailash Thapa**, **Kristen Olson**, **Adam Ketcher**, **David Wiljamaa**, **Kali Hargesheimer**, **and Daniel O'Loughlin** of St. Kate's.

Here is this week's puzzle:

Solve the puzzle below according to the usual rules--When a number is substituted for a letter, it stands for each appearance of that letter; different letters must be assigned to different numbers; none of the leftmost numbers are zero.

```
  D O S
  D O S
+ T R E S
 S I E T E
```

Mathematician Biography

Sorry we missed printing this for Peirce's birthday two weeks ago, but Augsburg's *Unbounded* club celebrated appropriately.

Charles S Peirce

Born September 10, 1839, in Cambridge, Massachusetts, **Charles S Peirce** was the son of Benjamin Peirce and studied at Harvard and worked for many years on the Coast and Geodetic Survey. He worked on geodesy but became interested in conformal map projections where he invented a quincuncial map projection using elliptic functions.

He was also interested in the Four Colour Problem and problems of knots and linkages studied by Kempe. He then extended his father's work on associative algebras and worked on mathematical logic and set theory. Except for courses on logic he gave at Johns Hopkins University, between 1879 and 1884, he never held an academic post.

T. S. Fiske, writing about the New York Mathematical Society (before it became the American Mathematical Society), describes Charles Peirce:

Conspicuous among those who in the early nineties attended the monthly meetings ... was the famous logician, Charles S Peirce. His dramatic manner, his reckless disregard of accuracy in what he termed 'unimportant details', his clever newspaper articles describing the meetings of our young Society interested and amused us all. ... He was always hard up, living partly on what he could borrow from friends, and partly on what he got from odd jobs such as writing book reviews ... He was equally brilliant, whether under the influence of liquor or otherwise, and his company was prized by the various organisations to which he belonged; and he was never dropped from any of them even though he was unable to pay his dues. He infuriated Charlotte Angas Scott by contributing to the New York Evening Post an unsigned obituary of Arthur Cayley in which he stated upon no grounds, except that Cayley's father had for a time resided in Russia, that Cayley had inherited his genius from a Russian whom his father had married in St Petersburg. Shortly afterwards Miss Scott contributed to the Bulletin a more factual, sober article upon Cayley's life and work...

Charles Pierce died April 19, 1914 in Milford, Pennsylvania.

by J. J. O'Connor and E. F. Robertson

*Source:
http://www-gap.dcs.st-and.ac.uk/~history/Mathematicians/Peirce_Charles.html