L'Augarithms

vol. 24.09 Visit us at <augsburg.edu/math/> We're in color March 2, 2011

Mathematics Colloquium Spring Lineup

Colloquia are typically held Wednesdays 3:40—4:40 in Oren 113.Highly sought-after refreshments are served.

Jan.	19	Infinite Secrets: The Genius of Archimedes
Feb.	2	Ken Kaminsky, Augsburg College
	16	Loren Larson, St. Olaf College
	23	Nancy Steblay, Augsburg College
Mar. →	2	Jiang-Ping Chen, St. Cloud State[1]
	23	Alicia Johnson, Macalester College
Apr.	6	Doug Dokken, University of St. Thomas
	20	Talks by Students

[1]This week's colloquium

Trigonometric Tables in China—

Jiang-Ping Jeff Chen, St Cloud State University

The Evolution of the Principles in Making the tables

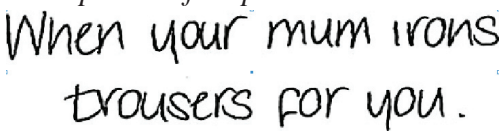
The stories of the Jesuits in 17th-century China, the science and mathematics they introduced, their strategy of proselytizing with scientific knowledge, and how they gained footing in the Chinese court through more accurate predictions of solar

(Colloquium Speaker — *continued on other side*)

Best School Humor

This came under the heading: How to fail a test with dignity.

Explain the phrase 'free press.'



Best Church Bulletin Humor

The following announcement appeared in a church bulletin, or was announced at a church service:

Next Thursday there will be tryouts for the choir. They need all the help they can get.

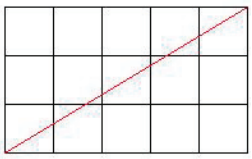
The Caption Contest

The *caption contest* is still alive. There has been much *talk* but little *action* on who will submit the best caption to the crime scene photo (see vol. 24.08, and photos hanging in the department area) and win the grand prize of **100 ft. of genuine yellow an black crime scene tape** which sits as we speak on the editor's bookshelf unclaimed and unfurled. Submit your caption as you would a solution to the POTW or PZOTW.

Problem of the week...

The POTW from vol. 24.08 was correctly solved by **Blake Vliep**, who was also the only solver of the POTW from v24.07. Here is the new POTW.

Take a checkerboard with n rows and m columns, with n and m relatively prime (i.e., having no common factors). Through how many squares does a line going from one corner of the board to the opposite corner pass? For example, a diagonal on a 3 by 5 checkerboad passes through 7 squares.



Your solution should provide an answer that is a function of the two variables n and m. Please explain your answer completely. Why should n and m be relatively prime?

❖ Reprinted with permission from Bradley U's old 'POTW' page <http://hilltop.bradley.edu/%7Edelgado/potw/potw.html>

Puzzle of the week...

Nice solutions to the PZOTW from v24.08 came from **Blake Vliep** and **Munawar Syed Hussain**. They both got 76 years of age.

There are 100 marbles in five bags. If the first and second bags contain 52 marbles between them, the second and third bags together contain 43, the third and fourth contain 34, and the fouth and fifth contain 30 marbles, how many marbles are there in each bag?

❖Submit puzzle & problem solutions to kaminsky@augsburg.edu, or under Ken Kaminsky's door at SCI 137E, or in the puzzles and problems box just outside of Su's office.

L'Augarithms
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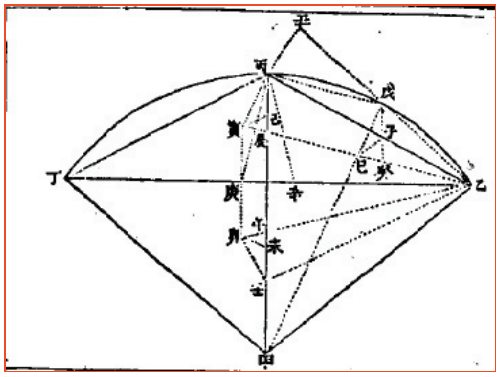
(Colloquium Speaker — ***continued from other side***)
and lunar eclipses in the calendar crises have been told many, many times. Spherical trigonometry, the computational basis for astronomy and calendrical science, is less discussed and scarcely analyzed, however. In the midst of trigonometry in early 17th-century China stood a powerful computational tool introduced by the Jesuits, trigonometric tables, which have in large part been invisible to and ignored by most historians of sciences in China. Aside from the important role played by the trigonometric tables in the context of the success of European astronomy in the China court, the evolution of the principles in the construction of the tables and Chinese scholars' perceptions of them proves intellectually stimulating in its own right. In this talk, we will examine how the principles of construction evolved over time from the early 17th century to mid 19th century when some Chinese scholars worked out the derivation of power-series-like algorithms for computing the values of trigonometric functions from the angles (arcs) and vice versa. When the new results became widely available, some Chinese scholars advocated replacing trigonometric tables with these algorithms.

The derivation of the principles also presents an important characteristic of the development of traditional mathematics in late Imperial China—finding principles based on the numbers and algorithms. Many powerful computational algorithms were introduced to the Chinese without any explanation or proof. Chinese scholars worked out the "origin" or "basis" (yuan) of these algorithms with indigenous knowledge, principles, and reasoning without input or help from European Jesuits. Such feats were considered by many Chinese scholars to support the claim that "Western Learning [came from] Chinese origin" (Xixue Zhongyuan).

This picture was used by one Chinese scholar to derive the half-angle formula for the sine function.



CARTOON CORNER — PIG LATIN