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# ***TCU Math News Letter***

**Volume 13, Number 1 September 2004**

*Mathematics consists of proving the most obvious thing in the least obvious way.*

- George Polya

[Editor: Dr. Rhonda Hatcher](#) and [Archive of Newsletters](#)

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## **First Parabola Meeting on September 14**

The first meeting of Parabola, the TCU undergraduate mathematics student organization, will be on Tuesday, September 14. The meeting will be a pizza lunch at 11:30 a.m. in TTC 300 followed by a talk by Professor Jacqueline Jensen of Sam Houston University in TTC 243.

The talk, which begins at 12 noon, is entitled "Classifying Celtic Knots." Celtic knots are an ancient and well-recognized art form. Professor Jensen will use Celtic knots to spawn a discussion of a variety of methods for classifying knots and will examine a number of knot invariants in this context.

The second meeting of Parabola will be on Tuesday, September 21, with a pizza lunch at 11:30 a.m. in TTC 300 followed by a talk at 12 noon in TTC 243 by Professor Henry Schenck of Texas A&M University.

Professor Schenck will talk about "Combinatorics and Commutative Algebra." This talk is about important areas of mathematics and will be aimed at undergraduates. No special knowledge is necessary.

Both talks are open to all students, faculty, and others interested in mathematics. Students interested in joining Parabola should come to a meeting or contact Professor Ken Richardson at [k.Richardson@tcu.edu](mailto:k.Richardson@tcu.edu).

## **TCU Research Lectureship Series Begins**

The TCU Research Lectureship Series, which is coordinated by Professor Igor Prokhorenkov, will begin on Tuesday, September 14 with a talk by Professor Jacqueline Jensen of Sam Houston University. She will present the talk "Generators of Certain Second Homotopy Modules."

Professor Henry Schenck of Texas A&M University will present the second talk in the Lectureship Series on Tuesday, September 21. He will talk about "Hyperplane Arrangements: Algebra, Combinatorics, and Topology."

Both of these talks will be held in TTC 246 at 4:00 p.m. Refreshments will be served before the talks in TTC-300 at 3:30 p.m.

**The G & G Math Directory**

TCU senior mathematics majors Chris Garrett and Alissa Grissom have created a web site called the G & G Math Directory. Chris and Alissa are building the directory to provide accurate definitions for all mathematical terminology used by undergraduate and graduate students of mathematics.

So far they have completed the abstract algebra and linear algebra terms, and they plan to expand this to encompass real analysis, complex analysis, and others in the near future. The directory can be found at the website: <http://www.krisgarrett.com/MathDictionary/MathHome>.

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## Solution to the April 2004 Problem of the Month

**Problem:** Evaluate  $\int \frac{\ln |\tan x + \sec x|}{\sin^2 x} dx$ .

**Solution:** We use integration by parts with  $u = \ln |\tan x + \sec x|$  and  $v' = 1/\sin^2 x = \csc^2 x$ . We obtain

$$\begin{aligned}\int \frac{\ln |\tan x + \sec x|}{\sin^2 x} dx &= -\cot x \ln |\tan x + \sec x| + \int \cot x \frac{\sec^2 x + \tan x \sec x}{\tan x + \sec x} dx \\ &= -\cot x \ln |\tan x + \sec x| + \int \frac{\cos x}{\sin x} \sec x dx \\ &= -\cot x \ln |\tan x + \sec x| + \int \csc x dx \\ &= -\cot x \ln |\tan x + \sec x| - \ln |\cot x + \csc x| + C.\end{aligned}$$

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## September 2004 Problem of the Month

Is it possible to cover a checkerboard with three L-shaped trominos? (An L-shaped tromino is a square with a square removed from one corner.) Reminder: "Yes" or "No" without adequate explanation is not an acceptable solution.

**Students and others are invited to submit solutions to Dr. George Gilbert (Math Dept. Office or P.O. 298900). Correct solutions submitted by persons who are not members of the TCU math faculty will be acknowledged in the next issue of the newsletter. Note that a correct solution is an answer and a justification of its correctness. The solution to the problem will be published in the next edition of the newsletter.**

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**The TCU Math Newsletter will be published each month during the academic year. Dr. Hatcher: Editor; Dr. Gilbert: Problem Editor; Dr. Doran: Thought of the Month Editor. Items which you would like to have included should be sent to Dr. Hatcher (Math Dept. Office or P.O. 298900).**