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# ***TCU Math News Letter***

**Volume 8, Number 3 November 1999**

*Proof is an idol before which the mathematician tortures himself.*

--- Sir Arthur Eddington

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

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## **TCU Lectureship Talks on November 8 and November 23**

There are two talks remaining in the fall semester in the TCU Lectureship Series.

Professor Noel Brady of the University of Oklahoma will present the talk "On the Isoperimetric Spectrum for Finitely Presented Groups" on Monday, November 8. Professor Mark Brittenham of the University of North Texas will present a talk entitled "The Best Surface(s) for Studying a Knot" on Tuesday, November 23.

Both talks will begin at 4:00 p.m. in Winton Scott Hall 145. Refreshments will be served in Winton Scott Hall 171 during the half-hour preceding each talk. All TCU students, faculty, and other interested members of the community are invited to attend the lectures.

## **Next Parabola Meeting on Wednesday, November 17**

The next meeting of Parabola, the TCU undergraduate mathematics club, will be on Wednesday, November 17. The meeting will begin at 3:00 p.m. with refreshments in Winton Scott Hall 171. At 3:30 p.m., Professor Igor Prokhorov of the TCU Mathematics Department will present the talk "Geometry of the Universe" in Winton Scott Hall 145. All TCU students, faculty, and other interested members of the community are invited to attend the meeting and talk.

Students interested in joining Parabola should contact Professor Rhonda Hatcher (in Winton Scott Hall 142 or at 257-6062 or [r.hatcher@tcu.edu](mailto:r.hatcher@tcu.edu)).

## **Prerequisite Change for Applied Mathematics**

Professor Ken Richardson will teach Applied Mathematics II, Math 50633, in the Spring 2000 semester. He plans to cover the topics optimization and linear programming in the course. Although the TCU catalog states that Applied Mathematics I, Math 50623, is a prerequisite, Professor Richardson is only requiring Linear Algebra, Math 30224, as a prerequisite.

## **New Upper Level Statistics Course Offered in Spring 2000**

Math 30853, Statistics, will be offered for the first time ever this spring. Think of it as a Math 10043 for

math majors and scientists at about the level of Math 30803. It will focus on applications of hypothesis testing with a touch of the theory behind the tests. Prerequisites are Math 20524 and Math 30803. For further information, contact Professor George Gilbert (in Winton Scott 141 or at 257-6061 or [g.gilbert@tcu.edu](mailto:g.gilbert@tcu.edu)).

## Goldwater Scholarship

Applications are now being accepted for the 2000 Barry M. Goldwater Scholarships. Three hundred Goldwater Scholarships are awarded each year to undergraduates interested in a career in mathematics, the natural sciences, or engineering.

To be eligible, you must be a current full-time sophomore or junior and must be pursuing a baccalaureate degree, have at least a B average, stand in the upper fourth of your class, and be a U.S. citizen, resident alien, or U.S. national. The scholarship covers eligible expenses up to a maximum of \$7500 per year. Last year, two TCU engineering students, Brent L. Bachim and Christopher A. Belk, were awarded Goldwater Scholarships.

Students interested in applying should contact Professor Rhonda Hatcher, the TCU Coordinator of Prestigious Scholarships, (in Winton Scott Hall 142 or at 257-6062 or [r.hatcher@tcu.edu](mailto:r.hatcher@tcu.edu)). The application deadline is January 15, 2000, but it is not too soon to begin the application process.

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## Solution to the October 1999 Problem of the Month

**Problem:** Are there any nonzero functions  $f$  and  $g$  for which  $(fg)' = f'g'$  and  $(f/g)' = f'/g'$  both hold?

**Solution:** There are no such nonzero functions. The correct formulations of the product and quotient rules must equal the given expressions, so

$$f'g + fg' = f'g' \text{ and } \frac{g'f - fg''}{g^2} = \frac{f'}{g'}$$

If we multiply the product rule expression by  $g'$ , clear denominators from the quotient rule expression, and add the two resulting equations, we obtain  $2f'gg' = f'g'^2 + f'g^2$  or  $f'(g' - g)^2 = 0$ . If  $f' = 0$ , then the product rule expression implies  $g' = 0$ , which is impossible. Otherwise,  $g' = g$ . The product rule expression then yields  $f = 0$  or  $g' = 0$ , both contradictions.

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## Problem of the Month

A version of the following was posted to the sci.math Internet newsgroup by "Grandpa Irv." Find all real solutions to

$$(x^2 - 5x + 5)^{x^2 - 9x + 20} = 1.$$

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).**