TCU Math Newsletter

I turn away with fright and horror from the lamentable evil of functions which do not have derivatives.

- Charles Hermite

Frank Stones Colloquium Talks

There will be two talks in the Frank Stones Colloquium talk series at TCU in February. The first speaker, Professor Stephan Stolz from Notre Dame University, will present his talk on Monday, February 11. The second talk will be given by Professor Luis Lomeli from the University of Oklahoma. Professor Lomeli will talk about "The Langlands--Shahidi method for the classical groups over function fields and applications" on Tuesday, February 19. Both talks will be at 3:30 pm in TUC 245. Refreshments will be served in TUC 300 before each talk.

National Science Foundation Research Experience for Undergraduates Summer Programs

The NSF funds a large number of summer research opportunities for undergraduate students through its REU Sites across the country. Students are granted stipends and, in most cases, housing and a travel allowance.

A list of REU sites in the Mathematical Sciences where you can find details about the individual programs and the application processes can be found at www.nsf.gov/crssprgm/reu/list_result.cfm?unitid=5044
The application deadlines vary for the different sites, but many of the deadlines are in February.
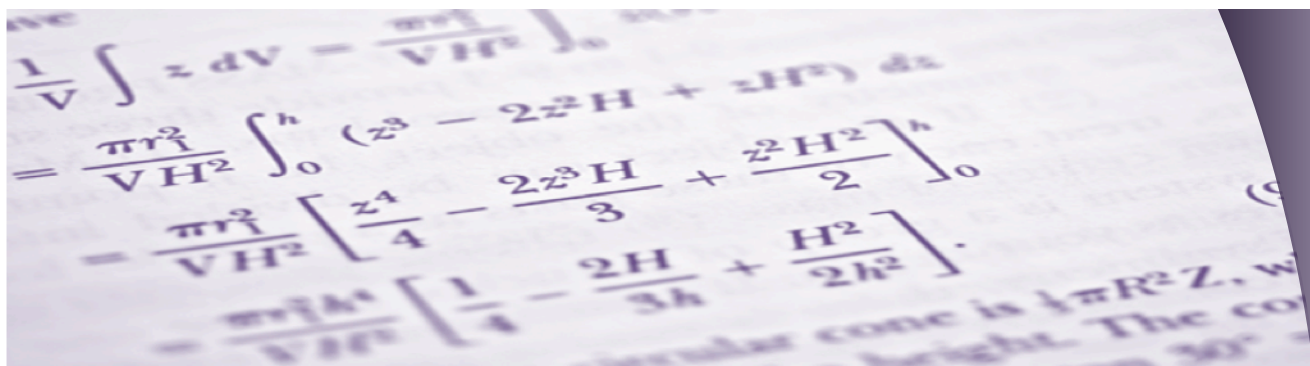
Texas/Oklahoma Research Undergraduate Symposium on February 23

The annual Texas/Oklahoma Research Undergraduate Symposium (TORUS) will be held at Midwestern State University in Wichita Falls, TX on Saturday, February 23rd, 2013. Undergraduate students, faculty and any persons interested in the mathematical sciences are encouraged to attend. The conference will include invited addresses from Dr. Jerry Dwyer and Dr. Lynette Boos, a panel discussion on careers in mathematics, various student talks, and a friendly Jeopardy-style contest between the represented university teams.

For more information about the conference and to register, visit the conference web site at http://homepages.se.edu/torus/. There is no fee or deadline to register for the conference, but undergraduates who are planning to give a presentation must register by February 6, 2013.

February Actuarial Talk

Senior Consultant and Actuary Zoe Rico from Aon Risk Consulting Americas will be the next presenter in the actuarial lecture series. The talk, "Projecting Losses," will be presented at 3:30 pm on Wednesday, February 6 at 3:30 pm in TUC 245. At this talk, you will learn how Monte Carlo simulations are used to predict losses.

Solution to the November 2012 Problem of the Month

Problem: In triangle ABC, the angle trisectors of angle A intersect side BC in points D and E. If $BD = CE$, must ABC be isosceles?

Solution: Yes, it must. Because they have equal bases and the same altitude, triangles ABD and ACE have equal areas. Because the measures of angles BAD and CAE are equal, it then follows that $AB \cdot AD = AC \cdot AE$. A similar consideration of triangles ABE and ACD implies $AB \cdot AE = AC \cdot AD$. Multiplying the two equations and cancelling leads to $AB = AC$, so the triangle is isosceles.

February 2013 Problem of the Month

As you change coordinates by rotating the coordinate axes about the origin, the equation of the ellipse $x^2 + 4y^2 = 1$ always has the general form $au^2 + buv + cv^2 = 1$. What is the largest possible value of $|b|$?

Students and others are invited to submit solutions to Dr. George Gilbert by e-mail (g.gilbert@tcu.edu) or hard copy (Math Dept. Office or TCU Box 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.