



TCU Math Newsletter

My friend G. H. Hardy, the mathematician, told me once that if he could find a proof that I was going to die in five minutes he would of course be sorry to lose me, but this sorrow would be quite outweighed by pleasure in the proof. I entirely sympathized with him and was not at all offended.

- Bertrand Russell

Professor Bob Doran to Speak at Parabola Meeting on March 21

Professor Bob Doran of the TCU Math Department will present the talk "Much ado about nothing: Was Shakespeare onto something?" at the next meeting of Parabola, the TCU undergraduate mathematics student organization. The talk will begin at 3:30 pm on Thursday, March 21 in TUC 245. Refreshments will be served before the talk in TUC 300.

Colloquium Talk

Professor John Zweck of the University of Dallas will present the talk "A diffeomorphic mean curvature flow for the processing of anatomical surfaces" on Friday, March 8 at 3:30 pm in TUC 246, with refreshments served before the talk in TUC 300.

Pi Day

Pi Day, a holiday commemorating π , is celebrated nationally on March 14 because in month/date format 3/14 matches the first digits of π . Because it falls during our spring break, TCU will celebrate it on Friday, March 22. The celebration will take place in the basement of Tucker from 11:30 am to 1:30, and includes a pizza eating contest for which the winner will get to throw a pie in a professor's face. There will also be a pie making contest and a pinewood derby competition. There are no entry fees, and all students and faculty are invited to attend.

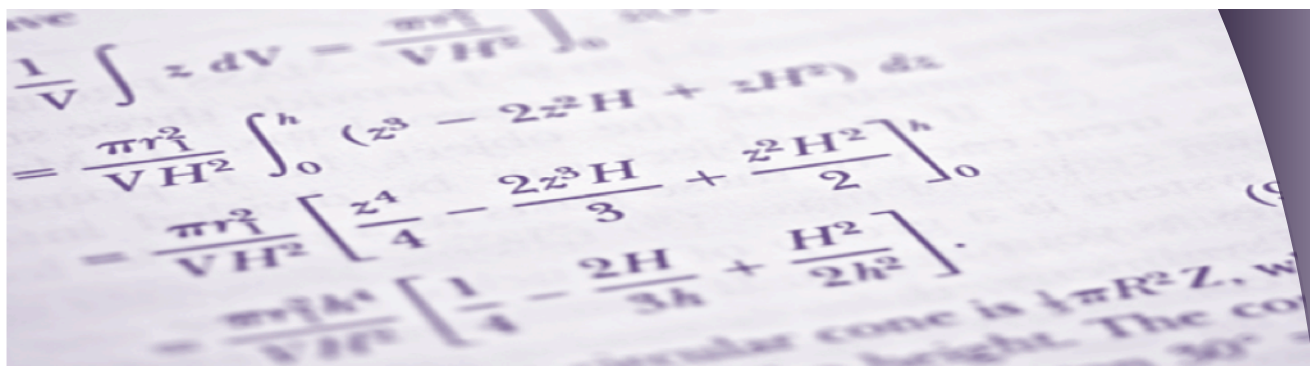
New Largest Known Prime Number!

A prime number with 17,425,170 digits was discovered by Professor Curtis Cooper of the University of Central Missouri in January 2013, making it the largest known prime. Dr. Cooper was a participant in the Great Internet Mersenne Prime Search (GIMPS), a cooperative project splitting the search across thousands of independent computers and involving 98,980 people.

This newly discovered prime is the Mersenne prime $2^{57,885,161} - 1$. A Mersenne prime is a prime number of the form $2^n - 1$. The first five Mersenne primes are 3, 7, 31, 127, and 8191, and there are only 48 known Mersenne primes. Since 1997, all newly discovered Mersenne primes have been found by GIMPS.

Call for Abstracts for the TCU Student Research Symposium (SRS)

The TCU College of Science and Engineering Research Symposium (SRS) is a relaxed forum in which students can present their work in a poster presentation. Any TCU undergraduate or graduate student who has been engaged in some form of research is strongly encouraged to participate. The deadline for abstract submissions is Thursday, March 28. For more information about SRS and to submit an abstract, visit the SRS website www.srs.tcu.edu.



Solution to the February 2013 Problem of the Month

Problem: 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 $|b|$?

Solution: The largest value of $|b|$ is 3. If (x, y) has coordinates (u, v) when the coordinate axes are rotated counterclockwise by an angle θ , then $x = u \cos \theta - v \sin \theta$ and $y = u \sin \theta + v \cos \theta$. The ellipse then has equation

$$(1 + 3\cos^2 \theta)u^2 + 6\sin \theta \cos \theta uv + (1 + 3\sin^2 \theta)v^2 = 1.$$

Since $6 \sin \theta \cos \theta = 3 \sin 2\theta$, its maximum absolute value is 3, occurring when $\theta = \pm\pi/4, \pm3\pi/4$.

March 2013 Problem of the Month

A version of this month's problem was posed by Stanley Rabinowitz in the 1990's. Each point on the circumference of a circle is colored either purple or white. Show that there are three points on the circle that have the same color and form the vertices of an isosceles triangle.

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