Vol 25 No 6
April 2017

TCU Math Newsletter

The imaginary number is a fine and wonderful resource of the human spirit, almost an amphibian between being and not being.

– Gottfried Wilhelm Leibniz (1646-1716)

Calculus Bee on Wednesday, April 26

The annual TCU Mathematics Department Calculus Bee will be held on Wednesday, April 26 at 2:00 pm in Tucker Technology Center 139. The material covered is Calculus I and II, but not beyond the material that current Calculus II students have had. Those wishing to compete should arrive for refreshments and contestant number assignment between 1:30 and 2:00 pm in TUC 300. (Those with a class conflict can simply go straight to TUC 139 at 2:00pm.) All TCU undergraduates are eligible to compete. TCU bookstore gift cards will be awarded to the top three finishers, with $75 for first place, $50 for second place, and $25 for third place.

TCU Math Colloquium on Friday, April 7

Professor John Brevik of California State University at Long Beach will present the talk "Bertini's Theorems, Bertini Theorems, and Applications" at the next TCU Math Colloquium on Friday, April 7. The talk will be at 3:30 pm in Tucker 352, and refreshments will be served at 3:00 pm in Tucker 300.

Math Majors Honored

Stephen Copson has been named the 2017 TCU Mathematics Department Senior Scholar. The winner of the award is determined by a vote of the Mathematics Department Faculty.

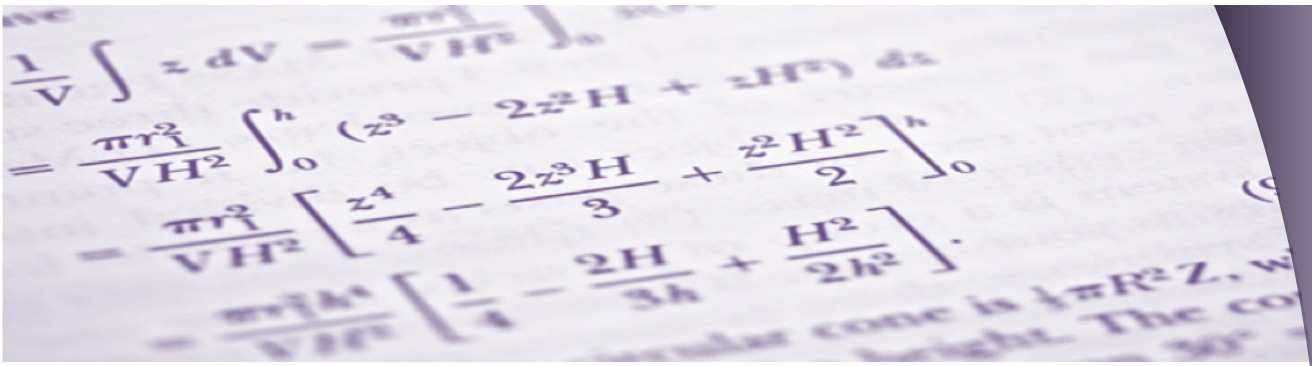
Math majors Harrison Cao, Thinh Doan, Lindsey Elliott, Linh Nguyen, and Luke Reddick will be initiated into the mathematics honor society Pi Mu Epsilon later this month. Math Majors Zach Amato, Sydney Heckes, Kaley Hickes, Rachel Hoffman, and Gunnar Roadfeldt were previously inducted.

Math majors Zach Amato, Dylan Barth, Bennett Yasskin, and Gunnar Roadfeldt will be initiated into membership in Phi Beta Kappa this May. Math majors Stephen Copson, Rachel Hoffman, and Alyssa Zellner were initiated into Phi Beta Kappa last year as juniors.

Congratulations to all of these students on their achievements.

TCU to host 2017 Great Plains Operator Theory Symposium

The TCU Math Department will host the 2017 Great Plains Operator Theory Symposium (GPOTS) May 22 – 26. GPOTS is held annually and brings together mathematicians from around the world whose primary research interests are in operator theory and/or operator algebras. For more information, contact TCU math professors José Carrión or Efton Park or see the conference web site, http://faculty.tcu.edu/jcarrion/gpots/.



Solution to the March 2017 Problem of the Month

Problem: Let n be a positive integer that is not divisible by the cube of any prime number. Show that n^2k is not a perfect cube for $k = 1, 2, \ldots, n-1$.

Solution: The following solution is due to Brad Beadle ('96). The prime factorization of n has the form

$$n = \prod_i p_i \cdot \prod_j q_j^2,$$

where the primes $\{p_i\}$ and $\{q_j\}$ are all distinct.

Then

$$n^2 = \prod_i q_j^3 \cdot \prod_i p_i^2 \cdot \prod_j q_j.$$

In order for n^2k to be a perfect cube, k must be divisible by

$$\prod_i p_i \cdot \prod_j q_j^2 = n.$$

This month's problem was also solved by Qi An and by Peter and Roger Bevan.

April 2017 Problem of the Month

What is the greatest distance between the points $(x, \sin x)$ and $(x + \pi/2, \sin(x + \pi/2))$ on the sine curve?

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.

Editor: Rhonda Hatcher
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