

TCU Math Newsletter

There can be no dull numbers, because if there were, the first of them would be interesting on account of its dullness.

- Martin Gardner

Frank Stones Colloquium Talks

The Frank Stones Colloquium Series will feature three talks in September 2015. Professor Conni Liaw from Baylor University will present the talk "Rank one perturbations and Anderson models" on Friday, September 11 at 4:00 pm. At 3:30 pm on Tuesday, September 15, Professor Ben McReynolds from Purdue University will present the second talk in the colloquium series, "Decision problems on groups." This talk will be accessible to anyone with a casual understanding of groups. The third speaker in September will be Professor Richard Shadrach of Rice University. His talk will be on Tuesday, September 29 at 3:30 pm. All three talks will be in TUC 352.

TCU students and members of the community are invited to attend the colloquium talks and the refreshments served in TUC 300 during the half hour before the start of each talk.

SERC Undergraduate Research Grant Applications Due September 29

The TCU Science and Engineering Research Center (SERC) is now accepting applications for the Fall 2015 round of SERC Undergraduate Research Grants. The application form and more information about the research grants are available on the SERC web site at <http://www.serc.tcu.edu>. The application submission deadline is September 29, 2015.

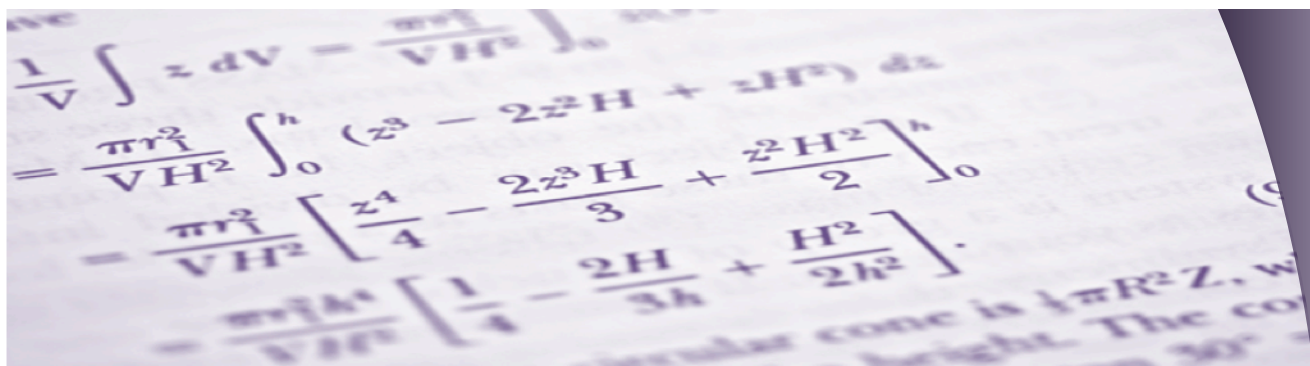
Putnam Mathematics Contest

The 76th Annual William Lowell Putnam Mathematical Competition will be held on Saturday, December 5, 2015, from 9:00 am to noon and 2:00 to 5:00 pm. The questions require different levels of mathematical background, and all require a bit of ingenuity to solve. The scores on the exam are typically quite low, and even answering a couple of questions is considered an excellent performance. The competition is open to undergraduates enrolled in colleges and universities of the United States and Canada who have not yet received a college degree. For more information about the contest visit <http://math.scu.edu/putnam/>. Those interested in signing up to take the Putnam exam this year should contact Professor George Gilbert at g.gilbert@tcu.edu by 5 pm on Thursday, October 1.

Actuary Talks on September 21 and 28

The TCU Mathematics Department hosts a series of talks related to an actuary career. All TCU students who are interested in learning about a career as an actuary are invited to attend.

The first talk in the actuary talk series will be on Monday, September 21 at 3:30 pm. At this talk, students will hear about career paths in the property and casualty insurance industry and learn how reserving models are developed. The speakers are from Wellington Insurance, and include TCU 2015 mathematics major graduate Marie Ballard. The other two speakers are Jen Nicklay, FCAS, and John Allen. A second actuary talk will be on September 28 at 3:30 pm. Both talks are in TUC 352, and refreshments will be available before both talks in TUC 300.



Solution to the April 2015 Problem of the Month

Problem: (V. N. Murty and J. M. Maynard) Let x be positive and let y be a real solution to

$$e^y = \frac{x}{1-e^{-x}}.$$

Prove that $x > 2y$.

Solution: (Adaptation of the solution of Brad Beadle '96) Rewrite the equation as

$$e^{x/2-y} = \frac{e^{x/2}-e^{-x/2}}{x}.$$

Applying the Mean Value Theorem (at 0 and x) to the right-hand side, there exists u with $0 < u < x$ such that

$$e^{x/2-y} = \frac{e^{u/2}+e^{-u/2}}{2} = \frac{(e^{u/4}-e^{-u/4})^2+2}{2} > 1,$$

hence $x/2 - y > 0$ or $x > 2y$.

September 2015 Problem of the Month

Suppose that the value of an investor's assets either double or are halved each year, each with probability $1/2$, not depending on the outcomes in previous years. Find the mean factor by which the investor's assets have changed over a period of n years.

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
 Problem Editor: George Gilbert
 Thought of the Month Editor: Robert Doran