

TCU Math Newsletter

Kepler's principal goal was to explain the relationship between the existence of five planets (and their motions) and the five regular solids. It is customary to sneer at Kepler for this. It is instructive to compare this with the current attempts to "explain" the zoology of elementary particles in terms of irreducible representations of Lie groups.

- S. Sternberg

The Mathematics of Good Will Hunting

Parabola, the undergraduate mathematics student organization, will be hosting its first event of the year on Thursday, October 4 at 7:30 PM in Lecture Hall 2 of Sid Richardson. The meeting will begin with undergraduate math major Brian Preskitt presenting a short talk on "the *Good Will Hunting* problem," which famously appears in the critically acclaimed film. After this talk, we will watch the movie and enjoy pizza together, with ice cream for dessert! All TCU students and faculty are invited to join us for a fun-filled night.

Putnam Mathematics Contest

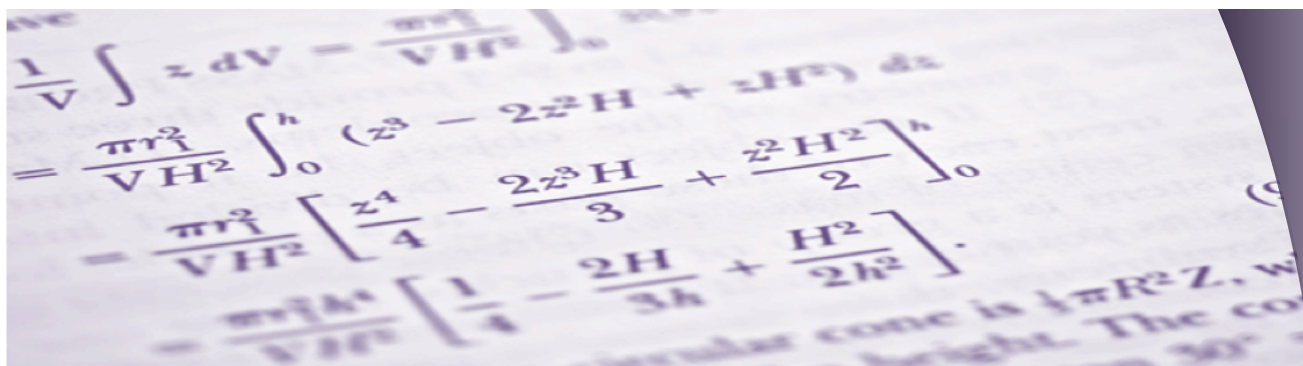
The 73rd Annual William Lowell Putnam Mathematical Competition will be held on Saturday, December 1, 2012, from 9:00 am to noon and 2:00 to 5:00 pm. The questions require different levels of mathematical background, and all require a bit of ingenuity to solve. The competition is open to undergraduates 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 Sunday, October 7.

October Actuarial Talks

Mr. Sean McPadden of Wellington Insurance will present the talk "The Actuarial Career Path Insurance" on Thursday, October 11 in TUC 246, and Mr. Jeremy Sutch of Advocate Insurance will present the talk "Insurance as an Actuarial Career" on Thursday, October 25 in TUC 139. Both talks begin at 3:30 pm.

Professor Art Benjamin to be the 2012 Math Green Honors Professor

The Department of Mathematics hosts a Green Honors Chair, Arthur Benjamin, Professor of Mathematics at Harvey Mudd College, from October 23 through October 25. Professor Benjamin has won the Haimo prize, the Mathematical Association of America's teaching award, as well as awards for his mathematical writings. He may be more widely known for his performance as a mathematician at TED conferences and on *The Colbert Report*. He will give an evening public lecture, "Secrets of Mental Math," where he demonstrates (and hopefully reveals) a few of his mathematical techniques. He will give several other independent talks with a general theme of puzzles (think Rubik's cube and Sudoku) and game theory (think backgammon and bluffing strategy). The schedule of talks is not yet set, but we hope to have them posted at <http://www.math.tcu.edu/talks.html> by the time you return from Fall Break.



Solution to the September 2012 Problem of the Month

Problem: A box has a jumble of identical extension cords (none plugged in). Two unattached, opposite ends are chosen at random and plugged into each other. The process continues until there are no more loose ends. What is the expected number of (very tangled) loops?

Solution: If n is the number of cords, the expected number of loops is

$$1 + \frac{1}{2} + \frac{1}{3} + \cdots + \frac{1}{n}.$$

For $n = 100$, the value is surprisingly small, approximately 5.2.

Let $L(n)$ be the expected number of loops when there are n cords. The first plugging has probability $1/n$ of forming a loop and leaving $n - 1$ loose cords. Otherwise there are simply $n - 1$ loose cords. Thus, $L(n) = L(n - 1) + 1/n$ and the claim follows by induction.

October 2012 Problem of the Month

This month's problem appeared as the University of Regina's problem of the month. Show that one can form a closed path in 3-dimensional space consisting of seven line segments of length 1 with a right angle between adjoining segments. (This is impossible with only five segments and very easy with six.)

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.