
TCU Math News Letter

Volume 14, Number 3 November 2005

Mathematics seems to endow one with something like a new sense.

-- Charles Darwin

[Editor: Dr. Rhonda Hatcher](#) and [Archive of Newsletters](#)

Mathematics Department Holiday Buffet

The Mathematics Department Holiday Buffet will be on Thursday, December 8 (the first study day) from 11:00 a.m. to 1:00 p.m. All mathematics department faculty, students, family, and friends are invited to attend. Please come by the Mathematics Department office to sign up for a dish to bring to the buffet.

Annual Joint Mathematics Meetings in San Antonio in January 2006

The Annual Joint Mathematics Meetings will be held in San Antonio, Texas January 12 - 15 (Thursday - Sunday), 2006. The meetings will be held in the Henry B. Gonzales Convention Center. The meetings will include several opportunities for mathematics students. On Friday from 9:00 a.m. to 10:20 a.m. a panel discussion on Undergraduate Career Paths in Mathematics will be held. The panel discussion will address the following questions: What good is an undergraduate mathematics degree in the job marketplace? What kinds of mathematical careers are there? What should you do now to increase your chances of getting the best job when you graduate? The panelists will discuss the various careers and options available to today's undergraduate students.

Also on Friday, from 5:45 p.m. to 7:15 p.m. will be another panel discussion on Current Issues in Actuarial Science Education. Several actuaries and actuarial educators will speak about the actuarial profession and provide information for students about meeting the requirements of the new exams.

On Saturday, 9:00 a.m. to 10:20 a.m., the panel discussion Transitioning into Graduate School will be held. This panel discussion will look at what you can expect when you start graduate school and what you can do to make the change from undergraduate to graduate student as smooth as possible.

On Saturday afternoon at 1:00 p.m. Marc A. Chamberland of Grinnell College will give a student lecture.

Interest Theory Course Offered in the Spring 2006 Semester

The Math 30603: Interest Theory will be offered at TCU in the Spring 2006 semester. The course will cover the development of the theory of interest and the related mathematics of finance. The required prerequisites are Calculus I and II, and the course may be used to fulfill an upper division course

requirement for a BA or BS in mathematics. All mathematics majors with the prerequisites should consider taking the courses, and those who plan to pursue the Actuarial Concentration in Mathematics should definitely take the course.

Students interested in learning more about the course or the Actuarial Concentration should contact Dr. Susan Staples at s.staples@tcu.edu.

Solution to the October 2005 Problem of the Month

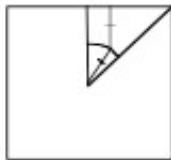
Problem: A point in a unit square is chosen at random. (For the technically inclined/hindered, it is chosen from the uniform distribution.) What is the probability the point is nearer the center of the square than the edge?

Solution: Because units don't matter, we may instead assume the square is $-1 \leq x \leq 1, -1 \leq y \leq 1$. By symmetry, it suffices to consider the region $0 \leq x \leq y, 0 \leq y \leq 1$, which has area $1/2$. The points (x,y) in this region that are equidistant from the center and the top of the square satisfy $\sqrt{x^2 + y^2} = 1 - y$. Squaring and simplifying, we obtain $y = (1 - x^2)/2$. This parabola intersects the line $y = x$ at $x = \sqrt{2} - 1$. Thus its area is

$$\int_0^{\sqrt{2}-1} \left(\frac{1-x^2}{2} - x \right) dx = \frac{4\sqrt{2}-5}{6},$$

and the probability is

$$\frac{4\sqrt{2}-5}{6} \bigg/ \frac{1}{2} = \frac{4\sqrt{2}-5}{3}.$$



The October problem was solved by John Rhoads.

November 2005 Problem of the Month

This month's problem is rumored to have been a Car Talk puzzler. You have two ropes that will burn for exactly one hour each, though not necessarily at a constant rate (in length/time). Show how to measure an interval of exactly 15 minutes.

Students and others are invited to submit solutions to Dr. George Gilbert (Math Dept. Office or P.O. 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.

The TCU Math Newsletter will be published each month during the academic year. Dr. Hatcher: Editor; Dr. Gilbert: Problem Editor; Dr. Doran: Thought of the Month Editor. Items which you would like to have included should be sent to Dr. Hatcher (Math Dept. Office or P.O. 298900).