

TCU Math Newsletter

History shows that those heads of empires who have encouraged the cultivation of mathematics, the common source of all the exact sciences, are also those whose reigns have been the most brilliant and whose glory is the most durable.

- Michael Chasles

January Actuarial Talk

Mr. Brian Levine from AON Hewitt Risk will present the next TCU actuarial talk on Wednesday, January 22 at 4:00 pm in TUC 137.

The TCU actuarial talk series features talks of particular interest to students in the actuarial program. Also, many of the talks are useful in general for any students interested in careers in industry or finance.

National Science Foundation Research Experience for Undergraduates Summer Programs

The NSF funds a large number of summer research opportunities for undergraduate students through its REU Sites across the country. Students are granted stipends and, in most cases, housing and a travel allowance.

A list of REU sites in the Mathematical Sciences where you can find details about the individual programs and the application processes can be found at www.nsf.gov/crssprgm/reu/list_result.cfm?unitid=5044

The application deadlines vary for the different sites, but many of the deadlines are in February.

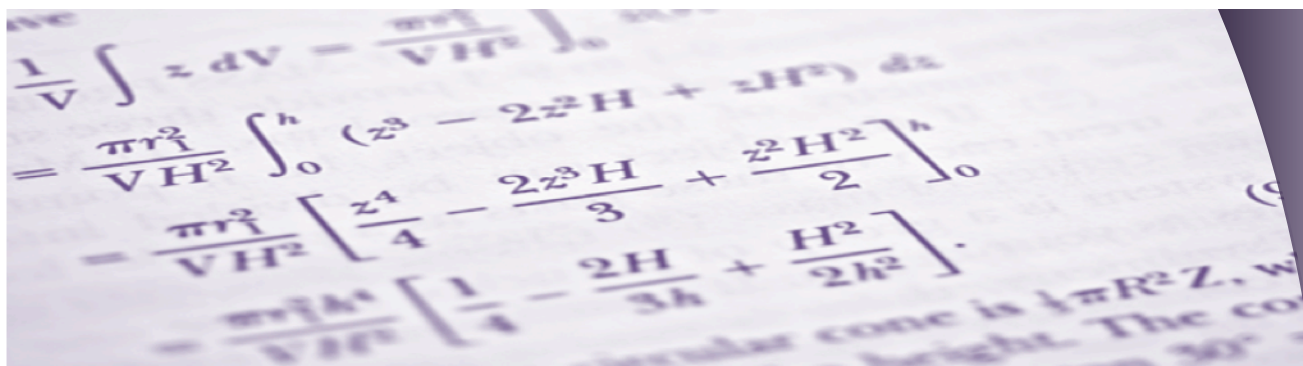
Career Conference on January 25

TCU Career Services is hosting a full day Career Conference focusing on preparing you for the job market and life after graduation. This free event is open to juniors, seniors, and graduate students. Topics will include Maximizing Internships, Job Offer and Salary Negotiations, Cracking the Hidden Job Market, Benefits 101, Utilizing LinkedIn for Professional Success, and an alumni panel discussion.

The Career Conference will take place in the BLUU Ballroom on January 25, 2014 from 9:00 am to 3:00 pm. Attendees will receive a free gift, and breakfast and lunch will be provided. Registration is required by January 22 and can be completed at the *Events* section at www.careers.tcu.edu

Internship Scholarship Program

If you are a TCU undergraduate and have or are interested in an unpaid or low-paying (less than \$1000) internship for Summer 2014 and need financial support, consider the TCU Internship Scholarship Program. The pilot program was launched in Summer 2013 with 153 students awarded almost \$300,000 in scholarships. Applications will be accepted for the Summer 2014 term beginning January 1. The application deadline is March 21. For more information and to apply for the scholarship go to careers.tcu.edu/gaining-experience.html



Solution to the November 2013 Problem of the Month

Problem: The real number

$$\sqrt[3]{25 + 10\sqrt{5}} + \sqrt[3]{25 - 10\sqrt{5}}$$

looks very irrational until you punch it into a calculator. Is it really an integer?

Solution: Our calculator suggests the value is 5. The likeliest possibility is that $25 \pm 10\sqrt{5}$ is the cube of the form $(a \pm b\sqrt{5})^3$ for some rational numbers a and b , in which case $a = 5/2$. Now,

$$\left(\frac{5}{2} \pm b\sqrt{5}\right)^3 = \left(\frac{125}{8} + \frac{75b^2}{2}\right) \pm \left(\frac{75b}{4} + 5b^3\right)\sqrt{5},$$

with solution $b = 1/2$.

The November Problem of the Month was solved by Ray Chandler ('68) and Brad Beadle ('96).

January 2014 Problem of the Month

This month's problem is a spin-off from problem B-6 of last December's Putnam. Alice and Bob play the following game, taking alternating turns, with Alice playing first. The playing area consists of $n > 1$ spaces, arranged in a line. Initially all spaces are empty. At each turn, a player either (1) places a stone in an empty space, or (2) removes a stone from a nonempty space s , places a stone in the nearest empty space to the left of s (if such a space exists), and places a stone in the nearest empty space to the right of s (if such a space exists). The first player to leave a single empty space loses. Prove that the game always ends after finitely many turns.

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