TCU Math News Letter

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Technical skill is mastery of complexity while creativity is mastery of simplicity.

-E. Christopher Zeema

Editor: Dr. Rhonda Hatcher and Archive of Newsletters

Frank Stones: 1904-2004

Mr. Frank Stones, a longtime friend of the TCU Mathematics Department, passed away on Sunday, March 28. He would have been 100 years old on July 23. His enthusiasm about mathematics and kind presence will be greatly missed.

Frank had a great interest in and love of mathematics. Over the years, Frank has attended talks and engaged in mathematical conversations with many members of the department.

Frank Stones' donations to the Mathematics Department funded the research lectureship series named in his honor.

Calculus Bee on April 7

The annual TCU Mathematics Department Calculus Bee will be held on Wednesday, April 7 at 3:00 p.m. in Tucker Technology Center 244. Refreshments for the contestants will be served at 2:30 p.m. in TTC 300.

All TCU undergraduates are eligible to compete. Prizes will be awarded to the top three finishers, with $75 for first place, $50 for second place, and $25 for third place.

Students wishing to compete in the Calculus Bee should sign up in the Mathematics Department office in TTC 206. While there is no deadline for signing up, we would like to know who is participating as soon as possible.

Student Presentations at the Next Parabola Meeting on April 15

At the next meeting of Parabola, TCU undergraduate students Ryan Dunning, Kris Garrett, Alissa Grissom, Catherine Hayter, Kip Souza, and Natalie Tennison will be making the presentation "Walking Through Fields of Magic Squares." The talk will be in Tucker Technology 138 at 3:30 p.m. on April 15. Refreshments will be served in TTC 300 at 3:00 p.m.

In this talk, the speakers will introduce a general method of constructing magic squares and explain the relation between magic squares and statistics, geometry, and a problem posed by the renowned Swiss mathematician Euler. No previous knowledge is needed for understanding this talk, and much wisdom and

witticism is promised.

Ryan Dunning Named Mathematics Department Senior Scholar

Ryan Dunning has been selected as the TCU Mathematics Department Senior Scholar for 2004. He will receive this honor at the TCU Honors Banquet on April 1. Ryan is a Goldwater Scholarship winner and has been conducting research under the guidance of Dr. Ken Richardson. Next year, Ryan plans to begin work on a Ph.D. in mathematics at Rice University or at the University of Texas at Austin.

Solution to the March 2004 Problem of the Month

Solution: The area of the region is $\int_{-1}^{1}\left(1-x^2\right)\ dx = \left(x - x^3/3\right)\big|_{-1}^{1} = 4/3$. Thus, we want the area below the line through $\left(u, u^2\right)$ and $(1,1)$ and above $y = x^2$ to equal 2/3. The line has equation $y - 1 = \dfrac{1-u^2}{1-u}(x-1)$ or $y = (1+u)x - u$. We need

$$\frac{2}{3} = \int_{u}^{1}\left((1+u)x - u - x^2\right)\ dx = \frac{(1+u)}{2}x^2 - ux - \frac{x^3}{3}\bigg|_{u}^{1}$$

$$= -\frac{u^3}{6} + \frac{u^2}{2} - \frac{u}{2} + \frac{1}{6} = -\frac{1}{6}(u-1)^3.$$

Therefore, $u = 1 - \sqrt[3]{4}$.

April 2004 Problem of the Month

To get into the spirit of this month's Calculus Bee, evaluate

$$\int \frac{\ln|\tan x + \sec x|}{\sin^2 x}\ dx.$$

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).