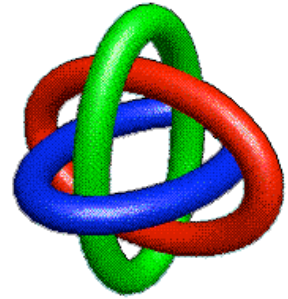


TCU MATH NEWSLETTER



[Problems & Solutions](#) | [Newsletter Archive](#) | [Mathematics Home Page](#)

October 2007
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What is man in nature? Nothing in relation to the infinite, all in relation to nothing, a mean between nothing and everything.

--- Blaise Pascal

Parabola Meetings on October 10 and 17

The first meeting of Parabola, the TCU undergraduate mathematics student organization, will be on Wednesday, October 10 at 4:00 p.m. in TTC 246. The meeting will feature a talk by TCU mathematics major Darren Ong entitled ***Minimal surface transformations***. The second meeting of Parabola will be on Wednesday, October 16 in TTC 246. Professor Jody Trout of Dartmouth College will present the talk ***Mathematics and the Mythos: All the Wrong Angles***. Refreshments will be served before the talk in TTC 300 at 3:30 p.m.

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Students interested in joining Parabola should come to a meeting or contact Professor Ken Richardson at k.richardson@tcu.edu.

Two TCU Frank Stones Research Lectureship Series Talks in October

Professor Klaus Kirsten of Baylor University will be the next speaker in the Frank Stones Research Lectureship series at TCU. The talk, entitled ***Functional determinants for separable partial differential equations*** will be presented at 4:00 p.m. on Tuesday, October 16 in TTC 245. Professor Eduardo Duenez of the University of Texas at San Antonio will present a talk in the Lectureship Series on Tuesday, October 30 at 4:00 p.m. The title and location of this talk will be announced at a later date on the TCU Mathematics Department web page www.math.tcu.edu.

Refreshments will be served before both talks in TTC 300 at 3:30 p.m.

Texas Undergraduate Mathematics Conference on November 3

The Third Annual Texas Undergraduate Mathematics Conference will be held on Saturday, November 3 at Sam Houston State University in Huntsville, Texas.

Registration is currently available online. The conference will provide breakfast, lunch, and snacks on Saturday for all registered participants. Conference organizers anticipate being able to provide housing for undergraduate students the night of November 2nd, but you must register online by October 10 to be eligible for funding. Students arriving on November 2 are invited to attend the pre-conference reception that evening. Students can choose to simply attend the conference, but they are also invited to give talks. Talk abstracts can be submitted on line. The abstract submission deadline is October 10.

In addition to talks of interest to undergraduates, there will be a panel discussion of career options for mathematics students.

For more information on the conference and to register and apply for travel support visit the web site www.shsu.edu/~mth_jaj/tumc/.

Problems and Solutions

Solution to the September 2007 Problem of the Month

Problem: Find two points on the parabola $y = x^2$ so that the line segment between them passes through $(0,1)$ and has length $\sqrt{18}$.

Solution: The line through $(0,1)$ with m has equation $y = m \cdot x + 1$. The x -coordinates of its intersections with $y = x^2$ are $(m \pm \sqrt{m^2 + 4})/2$. Because the difference in y -coordinates is m times the difference in x -coordinates, the distance between these points is $\sqrt{m^2 + 1} \cdot \sqrt{m^2 + 4}$. This equals $\sqrt{18}$ for $m^4 + 5m^2 - 14 = 0$, implying $m^2 = -7, 2$. Therefore, $m = \pm\sqrt{2}$ and the points are $((\sqrt{2} \pm \sqrt{6})/2, 2 \pm \sqrt{3})$ (or $((-\sqrt{2} \pm \sqrt{6})/2, 2 \mp \sqrt{3})$).

The September problem of the month was solved by undergraduates Duy Nguyen and Darren Ong.

October 2007 Problem of the Month

This month's problem comes with special incentive. Math major Darren Ong challenges TCU students to submit a correct solution before he does. If any TCU student (undergraduate or graduate) meets this challenge, Darren will dye his "hair bubble-gum pink for at least a week."

Each of n balls is dropped into either box A , B , or C , with respective probabilities p , q , or r (so $p + q + r = 1$). Find the area of the region of probabilities (p, q, r) for which all n balls in box A is at least as likely as any of the other $(n^2 + 3n)/2$ possible distributions.

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.

*The TCU Math
Newsletter is
published each
month during the
academic year.*

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**Thought of the
Month
Editor:**
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