

TCU Math Newsletter

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*If you don't learn from your mistakes,
there is no sense in making them.*

— Herbert Prochnow

Guest Lecturers to Present Undergraduate Talks

Professor Ze-Li Dou and Professor Susan Staples, members of the Mathematics Department of The College of Staten Island, City University of New York, will present talks at TCU.

Dr. Dou's talk is entitled "Fermat's Last Theorem." Last summer, the announcement that Professor Andrew Wiles of Princeton University had arrived at a proof of Fermat's "Theorem," which was a three hundred year old unsolved problem, made international headline news. Dr. Dou will present his talk on Thursday, February 3 at 3:20 p.m. in Winton Scott Hall 145

Dr. Staples will present a talk entitled "Quasidisks." Her talk is related to the currently popular topics of fractal geometry and dynamical systems. She will present her talk on Friday, February 4 at 3:00 p.m. in Winton Scott Hall 145.

There will be refreshments following both of the talks in Winton Scott Hall 171.

These talks are specifically intended for undergraduates, and all TCU students are invited to attend.

Two TCU Research Lectureship Talks in February

Professor Mark McConnell of Oklahoma State University will be the next speaker in the TCU Research Lectureship series. He will present the talk "Cohomology of Arithmetic Groups" in Winton Scott Hall 145 at 4:00 p.m. on Tuesday, February 8.

Professor Paul Goodey of the University of Oklahoma will be the second speaker in February. He will be speak on the "Geometry of Convex Sets," at 4:00 p.m. on Tuesday, February 22 in Winton Scott Hall 145.

Students, faculty, and other members of

the community interested in mathematics are invited to attend the lectures and to join us for refreshments at 3:30 p.m. in Winton Scott Hall 171.

TCU Mathematics Department to be a Research Experiences for Undergraduates Site in Summer 1994

The TCU Mathematics Department is one of the twenty-one departments across the country selected to be a National Science Foundation Research Experiences for Undergraduates Site in mathematics for Summer 1994. TCU was also an REU Site last summer, and will continue to be through Summer 1996. Dr. Rhonda Hatcher and Dr. George Gilbert are the co-principal investigators and Dr. David Addis is a faculty associate for the project.

For the TCU project, six undergraduate students will be selected from various universities to conduct research under faculty guidance. The student participants receive a stipend and housing support.

Undergraduates who are interested in learning more about or applying to the TCU REU project or other REU projects should contact Dr. Hatcher in Winton Scott Hall 142 or by phone at 921-7335. Please be aware that some application deadlines are as early as February 15, 1994.

February 15 Parabola Meeting

There will be a meeting of Parabola, the TCU Undergraduate Mathematics Club, on Tuesday, February 15 at 3:30 p.m. The purpose of the meeting is to discuss the possibility of establishing a student chapter of the Mathematical Association of America at TCU. Of course, as always, we will have plenty of refreshments.

Solution to the Dec. 1993 - Jan. 1994 Problem of the Month

Problem: *Little Caesar's Pizza is currently advertising a special where the customer can get up to 5 toppings on each of two medium pizzas. They state that there are 1,048,576 possible combinations for an order. How many toppings are available at Little Caesar's?*

Solution:

Little Caesar's offers 11 toppings.

As in so many "real world" problems, we must come up with plausible interpretations of the question along the way. We first need to know whether the order of the two pizzas matters. If n is the number of possibilities for one pizza, then there are n^2 possibilities for two if order matters and $n(n+1)/2$ if not. Only the former can equal 1,048,576, in which case $n=1024$.

Suppose there are T toppings. We must decide whether double toppings are allowed. If not, counting the number of pizzas with 0,1,2,3,4, and 5 toppings, we find

$$1+T+\binom{T}{2}+\binom{T}{3}+\binom{T}{4}+\binom{T}{5}=1024,$$

and $T=11$. If double toppings are allowed, counting the number of possibilities is equivalent to counting the number of ways to put 5 identical balls in $T+1$ boxes, the additional box representing a choice of no topping. Our equation becomes

$$\binom{T+5}{5}=1024,$$

which has no solution.

Problem of the Month

This month's problem was a problem of the week at Macalester College in Minnesota.

The race goes to the swiftest, or does it?

Alice and Bob run a marathon (assumed to be exactly 26.2 miles long) with Alice running at a perfectly uniform eight-minute-per-mile pace, and Bob running in fits and starts, but taking exactly 8 minutes and 1 second to complete each mile interval (this refers to all intervals of the form $[x, x+1]$, including, for example, the interval from 3.78 miles to 4.78 miles). Is it possible that Bob finished ahead of Alice?

Students and others are invited to submit solutions to Dr. George Gilbert (Math Dept. Office or P.O. 32903). 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.