TCU Math Newsletter

Volume 3, Number 5 **February 1995**

It looked absolutely impossible. But it so happens that you go on worrying away at a problem and it seems to get tired, and lies down and lets you catch it.

- William Lawrence Bragg

Two TCU Lectureship Series Speakers in February

The TCU Mathematics Department Research Lectureship continues this spring. The first speaker this semester will be Professor Alice Underwood of the University of North Texas. Dr. Underwood recently received her Ph.D. from Princeton University. She will present her talk, "Expensive Steiner Points," on Tuesday, February 7 at 4 p.m. in Winton Scott Hall 145.

The second Lectureship speaker for February will be Professor Peter Stiller of Texas A&M University. He will present a talk entitled "Geometry and Arithmetic of Elliptic Curves." Elliptic curves are very important mathematical objects which, among other things, can be used to prove results in number theory. Dr. Stiller's talk will be in Winton Scott Hall 145 at 4 p.m. on Tuesday, February 21.

All students, faculty, and other interested members of community are invited to attend the Lectureship Series talks. We hope that you can also join us for refreshments in Winton Scott Hall 171 during the half-hour preceding each talk.

Professor Ken Richardson to Talk About Math and Music

The next meeting of Parabola will feature a talk by Professor Ken Richardson entitled "Math and Music." Dr. Richardson is not only a mathematician, but he is also a professional saxophone player. We can expect to see both of these talents featured in his presentation.

The talk will be on Tuesday, February 28 at 3:30 p.m. in Winton Scott Hall 145 with refreshments served at 3:00 p.m. in Winton Scott Hall 171. Undergraduate students at all levels of mathematics should enjoy this talk.

Summer Research Positions for Mathematics Students

In the summer of 1995, the TCU Mathematics Department will once again be a National Science Foundation Research Experiences for Undergraduates Site.

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, 1995.

Students Are Needed to Help with Math Counts

The TCU Mathematics Department will host the Math Counts contest for local high school students. Because of the large number of participants this year, we will need some proctoring and grading help from TCU undergraduate mathematics, physics, and engineering students. The contest will be held on Saturday, February 18. If you are interested in helping, please contact Dr. Roy Combrink at 921-7335 or in Winton Scott Hall 162.

Professor Rhonda Hatcher Wins Deans' Teaching Award

Professor Rhonda Hatcher of the Mathematics Department was one of three recipients of the 1994 Deans' Teaching Award. The award was announced at Commencement on December 17. The other recipients were Professor Linda Moore of the Sociology Department and Professor Robert Vigeland of the Accounting Department.

Solution to the December 1994 - January 1995 Problem of the Month

Problem: *Consider the 100 statements: At least 1 of these statements is true. At least 1 of these statesmen's is false. At least 2 of these statements are true. At least 2 of these statements are false. At least 3 of these statements are true. At least 3 of these statements are false. . . . At least 49 of these statements are true. At least 49 of these statements are false. At least 50 of these statements are true. At least 50 of these statements are false.*
If each statement is either true or false, how many of these statements are, in fact, true?

Solution: Seventy-five of the statements are true. Let T_n denote the statement "At least n of these statements are true," with F_n defined similarly. Because $n \leq 50$, at least one of T_n and F_n is true. Hence, T_1, T_2, ..., T_{50} are all true. If F_{50} were true, F_1, F_2, ..., F_{50} would all have to be false. This contradiction implies that F_{50} is false, so that F_1 is true. It follows similarly that F_{49} is false and that F_2 is true, that F_{48} is false and that F_3 is true, and so forth, and finally that F_{26} is false and that F_{25} is true. (Warning: this is a delicate business. Try it with a total of 10 statements to see the paradoxical results that are possible with self-referential statements.)

Problem of the Month

The famous Four Color Theorem states that four colors suffice to color a map in the plane, with all regions one piece only, so that two regions sharing a common edge are different colors. How many colors are needed to color a map of the continental United States? (Note that Michigan has two pieces, so the Four Color Theorem does not apply directly.) You must show that this number will do as well as showing that fewer won't.

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.

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. 32903).