TCU Math News Letter

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I'm pretty sure this result is true . . . I wouldn't bet my life on it, but I'd bet yours.

-- Eric Guentner

Editor: Dr. Rhonda Hatcher and Archive of Newsletters

TCU Research Lectureship Series

The Frank Stones Lectureship Series will feature a talk by Professor Jeff Vaaler of the University of Texas at Austin on Tuesday, March 7, 2006. Professor Vaaler will present the talk "An ABC Inequality for Roots of Polynomials" in Tucker Technology Center 246 at 4:00 p.m.

In 1983 Richard Mason proved a new but remarkably simple inequality about polynomials in one variable with complex coefficients. Mason's inequality inspired the ABC conjecture of Masser and Oesterle, which is an analogous simple statement about integers. It is known that a proof of the ABC conjecture would lead to a solution of several deep and important problems in number theory. For example, Fermat's Last Theorem is an easy consequence of the ABC conjecture. Professor Vaaler's talk will describe a hybrid result similar to Mason's but giving information about numbers: namely the roots of polynomials.

Refreshments will be served before the talk in TTC-300 at 3:30 p.m.

Student Research Symposium Dates

The TCU Student Research Symposium (SRS) will be held on Friday, April 21, 2006. Any undergraduate or graduate student who has been engaged in some form of research within the TCU College of Science & Engineering is strongly encouraged to participate. The deadline for abstract submissions and electronic posters is Friday, April 7.

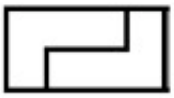
For more information about SRS and to summit an abstract, visit the SRS website www.srs.tcu.edu.

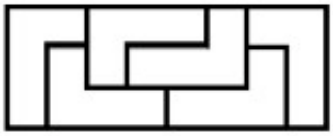
Solution to the February 2006 Problem of the Month

Problem: Which m by n rectangles can be tiled with an L-shaped tetromino made up of four unit squares? (The tetromino must cover the rectangle exactly with no overlap. It can be rotated and flipped.)

Solution: The rectangles that can be tiled have m and n at least 2 and mn a multiple of 8. Because the area

of a tetromino is 4, it is clear that mn must be a multiple of 4. Orient the rectangle so the number of columns is even and then number the columns. Each tetromino has either one or three of its squares in odd numbered columns. The odd-numbered columns have the same number of squares as the even-numbered columns. Therefore, the number of tetrominoes with one square in odd-numbered columns equals the number with three squares in odd-numbered columns, so the number of tetrominoes is even. We conclude mn is a multiple of 8. We can use the 2-by-4 and 3-by-8 configurations below to tile any such rectangle (so long as and are at least 2).





March 2006 Problem of the Month

This month's problem has appeared in Sudoku newsgroups and was a recent Macalester College Problem of the Week. Consider a 4-by-4 Sudoku using the numbers 1, 2, 3, 4. What is the minimum number of squares that need to be given in order to have a unique solution?

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).