
TCU Math News Letter

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This is a shallow book on deep matters, about which the author knows next to nothing.

-- Robert P. Langlands

(Book Review in Notices of the American Mathematical Society 49 (2002), 554)

[Editor: Dr. Rhonda Hatcher](#) and [Archive of Newsletters](#)

Frank Stones Research Lectureship Talk on November 7

Professor Shelly Harvey of Rice University will present the talk "Knot Concordance and Blanchfield Duality" at 4:00 p.m. on Tuesday, November 7 in Tucker Technology Center 246. The talk is part of the Frank Stones Research Lectureship series.

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

All TCU students and faculty and other interested members of the community are invited to attend.

New Course Offering for Spring 2007

Professor Greg Friedman will be offering a new upper level mathematics course at TCU this spring. The course is Math 40970/60970, and is entitled "Topology of Spaces and Knots." The course has only Linear Algebra as a prerequisite. If you have any questions about the course, you can direct them to Dr. Friedman at g.friedman@tcu.edu.

Mathematics Department Holiday Buffet

The Mathematics Department Holiday Buffet will be on Thursday, December 7 from 11:00 a.m. to 1:00 p.m. All mathematics department faculty and family are invited to attend. Please come by the Mathematics Department office to sign up for a dish to bring to the buffet.

Putnum Exam Reminder

TCU students who signed up to compete in the Annual William Lowell Putnam Mathematical Competition should remember that the exam will be on Saturday, December 2, 2006, from 9:00 a.m. to noon and 2:00 to 5:00 p.m.

If you need more information about the Putnam, please contact Professor George Gilbert at

Solution to the October 2006 Problem of the Month

Problem: What is the last nonzero digit (reading from left to right) in the decimal expansion of $50!$?

Solution: The last nonzero digit is 2. To avoid brute calculation, the key observation is that the last nonzero digit of the product of two numbers whose last nonzero digits are not 5 is the last digit of the product of their last nonzero digits. We factor $50!$ into the following factors

$$(11 \cdot 12 \cdot 13 \cdot 14 \cdot 16 \cdot 17 \cdot 18 \cdot 19)(21 \cdots 29)(31 \cdots 39)(41 \cdots 49)$$

and

$$(1 \cdot 2 \cdot 3 \cdot 4 \cdot 6 \cdot 7 \cdot 8 \cdot 9)(5 \cdot 10 \cdot 15 \cdots 45 \cdot 50).$$

The last digit of the former is the last digit of $(1 \cdot 2 \cdot 3 \cdot 4 \cdot 6 \cdot 7 \cdot 8 \cdot 9)^4$, which in turn is the last digit of 6^4 , which is 6. Now

$$5 \cdot 10 \cdot 15 \cdots 45 \cdot 50 = 5^{10} 10! = 2 \cdot 5^{12} (1 \cdot 2 \cdot 3 \cdot 4 \cdot 6 \cdot 7 \cdot 8 \cdot 9)$$

and

$$1 \cdot 2 \cdot 3 \cdot 4 \cdot 6 \cdot 7 \cdot 8 \cdot 9 = 2^7 (3 \cdot 3 \cdot 7 \cdot 9).$$

Therefore, the last factor may be rewritten as $10^{12} 2^3 (3 \cdot 3 \cdot 7 \cdot 9)^2$, which has last nonzero digit 2. Finally, our answer is the last nonzero digit of $6 \cdot 2$ or 2.

Chris Ulmet solved this month's problem.

November 2006 Problem of the Month

Suppose teams A and B are playing a best of $2n-1$ series (i.e. first team to win n games wins the series). If team A has probability $p > 1/2$ of winning any given game of the series, show that A's probability of winning the series increases as n increases.

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).