TCU Math News Letter

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Perfect numbers like perfect men are very rare.

- René Descartes

Editor: Dr. Rhonda Hatcher and Archive of Newsletters

Calculus Bee on April 13

The annual TCU Mathematics Department Calculus Bee will be held on Wednesday, April 7 at 5:30 p.m. in Tucker Technology Center 244. Refreshments for the contestants will be served at 5:00 p.m. in TTC 300.

All TCU undergraduates are eligible to compete. Prizes will be awarded to the top three finishers, with $75 for first place, place, $50 for second place, and $25 for third place.

Students wishing to compete in the Calculus Bee should sign up in the Mathematics Department office in TTC 206. While there is no deadline for signing up, we would like to know who is participating as soon as possible.

Poker Math 101 at Next Parabola Meeting

The next meeting of Parabola, the TCU undergraduate mathematics student organization, will be on Tuesday, March 29. Professor George Gilbert will present the talk "Poker Math 101" at 3:30 p.m. in Tucker Technology Center 244. Refreshments will be served in TTC 300 from 3:00 to 3:30p.m.

In the talk, Professor Gilbert will show some of the reasons why probability and statistics, game theory, and random walks need to be in every poker player's vocabulary. Many of the examples will come from Texas Hold'em.

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

Student Research Symposium Dates

The TCU Student Research Symposium (SRS) will be held on Friday, April 22, 2005. Students wishing to present a poster in the symposium must submit an abstract by Wednesday, March 23. A workshop on using the program Canvas to make posters will be held in SWR 237 on Tuesday, March 22 from 3:00 to 5:00 p.m. A workshop on how to convert posters to PDF format will be held on Tuesday, April 12. The deadline to submit posters (in PDF format) is Friday, April 15. For more information about SRS and to summit an abstract, visit the SRS website www.srs.tcu.edu.

Solution to the February 2005 Problem of the Month

Problem: Suppose that the posted odds against the four horses in a race are 2-1, 3-1, 4-1, and 5-1. Show that you can bet on this race in such a way that you are sure to make a profit.

Solution: Let's try to bet w, x, y, and z on the horses in such a way to always make a profit of 1. In mathematical terms, we want to solve the system of equations

$$\begin{aligned} 2w - x - y - z &= 1 \\ -w + 3x - y - z &= 1 \\ -w - x + 4y - z &= 1 \\ -w - x - z + 5z &= 1. \end{aligned}$$

The solution is $w = 20/3$, $x = 5$, $y = 4$, $z = 10/3$. If fractions are our enemy, let $w = 20$, $x = 15$, $y = 12$, $z = 10$, which yields a profit of 3 no matter which horse wins. There are many other solutions. It is possible because the corresponding probabilities of winning total to less than 1, i.e.

$$\frac{1}{3} + \frac{1}{4} + \frac{1}{5} + \frac{1}{6} < 1.$$

December graduate Kris Garrett gave a correct solution.

March 2005 Problem of the Month

In a Texas hold'em poker game, each player gets two cards, which they combine with five shared community cards to make the best five-card hand. If Player A has the ace of spades and ace of diamonds, Player B has the queen and jack of hearts, and so far (after the "flop") the community cards are the ten of clubs, the nine of clubs, and the three of hearts. Who is favored to win, and by how much, after the final two community cards are dealt?

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).