TCU Math News Letter

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If there is a 50-50 chance that something will go wrong, then 9 times out of 10 it will.

-- Paul Harvey

Halloween Parabola Talk

Professor George Gilbert will give a Parabola talk on Wednesday, October 26, from 3 to 4 in Tucker Technology Center 138. Refreshments will precede the talk in TTC 300. Entitled "The Horrors of the Hats," the talk will investigate several counterintuitive problems that involve hats.

One example is the following: One hundred people form a line and are assigned the number 1, 2, ..., 100. A red or blue hat, chosen at random, is placed on each person's head. Each person can only see the hats of those with a higher number. Starting with person #1, each person yells out a color, which all can hear. Once all 100 have yelled, the number who have named the color on their own heads are counted. The people are allowed to get together ahead of time to determine a strategy, but cannot communicate in any way once the hats are placed. What is the largest number of hats that can be guessed correctly in the worst possible case? (For instance, if each person guesses his or her own hat color randomly, the worst case is 0.)

The answers to the problems are most surprising and enjoyable to those who have thought at least a little bit about them. The questions are posted at faculty.tcu.edu/ggilbert/hats.html.

You don't have to solve the problems (most solutions are pretty hard to come up with, but not so hard to understand), but do try to guess the answers.

Graduate and Professional School Day and Junior Jump Start

University Career Services is hosting two events that should be of interest to many undergraduates.

On Tuesday, October 18, representatives from several graduate schools will be on campus for the annual Graduate and Professional School Day. The event will be held from 10 a.m. to 2 p.m. in the Student Center Lounge.

Junior Jumpstart will be held from 9:30 a.m. to 5:30 p.m. on Saturday, October 22. Junior Jumpstart is an all day program for TCU juniors. Activities include practice interviewing with various employers, learning about workplace communication, and learning about the graduate school application process. Participants will also learn about networking, and then apply these skills at lunch with TCU alumni. Registration begins on October 3 and ends on October 16 at my.tcu.edu.

Putnam Mathematics Contest

There are still one or two spots open to take the Putnam contest on December 3. Those interested should contact Professor George Gilbert (g.gilbert@tcu.edu or x6061).

Solution to the September 2005 Problem of the Month

Problem: Ten pennies are placed in the triangular configuration shown below, some heads, some tails. Must there exist three pennies whose centers form an equilateral triangle of either all heads or all tails? (Two possible equilateral triangles are indicated on the diagram.)

Solution: Some three pennies must form an equilateral triangle of all heads or all tails. Suppose not. Label the coins 1, …, 10 as shown in the first figure. The three corners cannot all be the same, so one must be different from coin 5. We may assume coin 1 is tails and 5 is heads without loss of generality. Coins 2 and 3 must now be different. Again, symmetry allows us to assume coin 2 is heads and coin 3 tails. Coins 2 and 5 imply coin 4 is tails. Coins 3 and 4 now imply coin 9 is heads. Coin 6 must now be part of an equilateral triangle of all heads (coins 5, 6, and 9) or all tails (coins 1, 4, and 6), a contradiction.
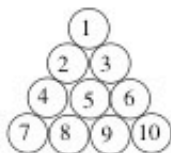
October 2005 Problem of the Month

A point in a unit square is chosen at random. (For the technically inclined/hindered, it is chosen from the uniform distribution.) What is the probability the point is nearer the center of the square than the edge?

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.