Problem of the Month — October 2009

Duel: Three men, Fermat, Galois, and Hilbert, decide to fight a pistol duel. Theyll stand at the corners of an equilateral triangle, and each man, in order, will aim and shoot wherever he pleases. They choose randomly who will be shooting first, second, and third, and will continue in that order until two of them are dead. All three know that Fermat always hits his target 90% acutare, Galois is 70% accurate, and Hilbert hits his mark half the time. Assuming that all three adopt the best strategy and that nobody is killed by a wild shot not intended for him, who has the best chance to survive, and why? Also, find the survival probabilities for each man.

Deadline: October 30, 2009, 5:00pm.

- You may get a copy of this from the wall behind you.

- Submit your solution to

    - Dr. Yuanhui Xiao @ *matyxx@langate.gsu.edu* or
    - Dr. Erol Akabs @ *matexa@langate.gsu.edu,*
    - or drop a hard copy in their mailbox before the deadline.

Problem of September:

An experiment. You are given two identical bowling balls. Your goal is to determine the maximum height a bowling ball doesn't break when it is dropped from this height. You use a 150 floor building for your experiment, and you find the maximum height in terms of floors from the ground level. In order to find the maximum height, what is the least number of drops needed?

Solution: In terms of the number of floors from the ground level, the maximum height you can determine exactly if a bowling ball breaks with n drops is

$$(n) + (n - 1) + (n - 2) + \ldots + 2 + 1 = n(n + 1)/2.$$

We would like this number to be smallest integer greater than or equal to 150. Therefore, $n = 17$.

Winner: Ben Sirb.

The following students also gave correct answer: Jeremy Kastine, Tsu-wa Tseng and Robert Xu.