INTRODUCTION

Since this is the first issue of a new academic year, let me once again review the ground rules. In each issue I present three regular problems (the first of which is normally bridge related) and one "speed" problem. Readers are invited to submit solutions to the regular problems, and two columns later (not every issue of TR contains a ‘‘Puzzle Corner’’ column) one submitted solution is printed for each regular problem; I also list other readers who responded. For example, solutions to the problems you see below will appear in the 2004 March issue and the current issue contains solutions to the problems posed in 2003 May issue.

I am writing this column mid July and anticipate that the 2004 Mar column will be due in December. Please try to send your solutions early to ensure that they arrive before my submission deadline. Late solutions, as well as comments on published solutions, are acknowledged in subsequent issues in the "Other Respondents" section. Major corrections or additions to published solutions are sometimes printed in the "Better Late Than Never" section as are solutions to previously unsolved problems.

For speed problems the procedure is quite different. Often whimsical, these problems should not be taken too seriously. If the proposer submits a solution with the problem, that solution appears at the end of the same column in which the problem is published. For example, the solution to this issue's speed problem is given below. Only rarely are comments on speed problems published.

There is also an annual problem, published in the first issue of each year, and sometimes I go back into history to republish problems that remained unsolved after their first appearance.

PROBLEMS

Oct 1. Larry Kells wants to know what is your best chance to make 7 Spades with:

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S - A
H - AKQ
D - 5
C - J9765432

S - KQJ1098
H -
D - AKQJ432
C -
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The opening lead is a spade, RHO following. Assume there are no inferences to be had from the bidding or the lead, and that the opponents will make no mistakes for the rest of the play.

Oct 2. Donald Aucamp offers us the ‘‘Three Hat Problem’’.

Three logical people, A, B, and C, are wearing hats with positive integers painted on them. Each person sees the other two numbers, but not his own. Each person knows that the numbers are positive integers and that one of them is the sum of the other two. They take turns (A, B, then C) in a contest to see who can be the first to determine his number. In the first round A, B, and C all pass, but in the second round A correctly asserts that his number is 50. What are the other two numbers and how did A determine his was 50?

Oct 3. Fred Gardiol wonders how many different resistances he can obtain by connecting 10 one-ohm resistors.

SPEED DEPARTMENT

Some more standard conversion factors from Sanjay Palnitkar. As an example, 1,000,000 aches is 1 megahertz. What is

1 million billion piccolos
10 rations
100 rations
0.5 large intestine
the time between slipping on a peel and smacking the pavement
365.25 days of drinking low-calorie beer

SOLUTIONS

May 1. Robert Bishop found that the friend's wife could hold S-AK1098765, D-AKQ65, with 16 high-card points (which the proposer must have meant).

The beauty of the friend's seemingly abysmal dummy is that it contains as many as three trumps and exactly three diamonds. These holdings imply that (1) the opponents have jst two trumps and five diamonds between them, (2) since no suit breaks evenly, one opponent must hold both trumps, so two rounds are needed to draw them, (3) dummy can now ruff a fourth diamond, hopefully setting up declarer's fifth diamond as her thirteenth trick, and (4) the grand slam is made unless one opponent improbably holds all five diamonds.

The chance of success when the dummy first appears turns out to be 98.3 percent--even better than claimed in the problem.

Given the six-four split of the opponents' hearts (from the bidding), there are three possible paths to victory: (a) each opponent, holds one trump (since the actual trump division is not yet known), (b) the opponent with six hearts holds both trumps, and (c) the other opponent holds both trumps. The probabilities of (a), (b), and (c) are, respectively, .525, .175, and .3.

With (a), victory is assured because dummy can ruff both of declarer's two low diamonds. With (b) and (c), the probabilities of victory are, respectively, .9366 and .9790. Futhermore, .175 (.9366) = .164, and .3 (.9790) = .294; so .525 + .164 + .294 = .983.

May 2. Richard Hess exceeded the requirement and found a square with 29 different sums that add to 264. The rotated square has the same entries.

11	16	18	19
61	66	68	69
81	86	88	89
91	96	98	99

Readers who can view "xls" files (normally produced by excel) can see a solution, from Charles Morton. develop in stages on my "overflow" web site http://allan.ultra.nyu.edu/~gottlieb/tr. I don't run excel, but it does show correctly with staroffice under linux.

May 3. The following solution is from John E. Prussing.

For the two equal large masses to orbit at a constant distance R from their center of mass C, a balance of centrifugal acceleration and gravitational acceleration gives $w^2 R = \frac{GM}{4R^2}$, where w is the orbital angular velocity. The small collinear mass must orbit at a constant distance x from point C at this same angular velocity. Balancing centrifugal and gravitational accelerations on it gives $w^2 x = \frac{GMx}{4R^3} = \frac{GM}{(x-R)^2} + \frac{GM}{(x+R)^2}$. Defining y as x/R and doing some algebra gives $y^5 - 2y^3 - 8y^2 + y - 8 = 0$. This equation has one real solution, equal to 2.3968.

OTHER RESPONDERS

Responses have also been received from D. Bator G. Blum C.K. Brown D. Church H.I. Cohen D. Dechman R. Giovanniello H. Hindman S. Kanter K.L. Rosato H. Sard R. Schweiker E. Signorelli B. Simon W. Sun T. Terwilliger A.E. Zeger

PROPOSER'S SOLUTION TO SPEED PROBLEM

1 gigolo, 1 decoration, 1 C-ration, 1 semicolon, 1 bananasecond, 1 lite year.