INTRODUCTION

It has been a year since I specified the size of the backlogs for the various kinds of problems that are printed. Currently, I have multi-year supplies of regular and speed problems. Bridge problems, however, are in extremely short supply. Chess, Go, and computer problems are now considered regular problems.

PROBLEMS

APR 1. We begin with a Bridge problem from Tom Harriman.

North

S	Q 8 6 5
H	10 3 2
D	9
C	A J 9 8 5

West

S	J 10 3
H	A K 5 4
D	K Q 10
C	K 7 6

East

S	9 2
H	Q 9 7
D	J 8 6 5 4 2
C	4 3

South

S	A K 7 4
H	J 8 6
D	A 7 3
C	Q 10 2

West	**North**	**East**	**South**
1D	P	P	DBL
P	2C	2D	2S
P	4S	P	P
P			

Opening Lead: HK

First, if you are East, what do you play on the first trick? Second, if you are West, what do you do next?

APR 2. Here is one with a surprising result from the late Bob High. What is the the volume of an n dimensional ball of radius R and what is the limiting value of this volume as n goes to infinity.

APR 3. Nob. Yoshigahara has sent us a problem that, presumably due to a distant Spanish heritage, he calls ‘‘El Puzzle’’. Nob. wants you to put all 9 little Ls into the big L. You may rotate the Ls but may not turn them upside down.

Please place figure number 1 here.

SPEED DEPARTMENT

A Bridge quickie from Doug Van Patter.

North
S K J
H A 10 7
D A 9
C J 7 6 5 4 2

South
S A Q 5
H Q J
D K Q J 10 8
C A Q 8

You are declarer in a six No Trump contract. West leads the nine of Spades, won with the Jack. When you lead a low Club, East discards the eight of Hearts. Can you still make twelve tricks?

SOLUTIONS

N/D 1. We begin with a bridge problem from Dudley Church, who wants to know if South can make 6 Spades against an opening lead of the Heart King?

North
S K Q 3
H Void
D J 6 5
C A K 10 8 5 4 2

West		**East**	
S	J 8 4	S	2
H	A K 6 3	H	10 9 8 7 4 2
D	K 10 9 3	D	7 4 2
C	9 6	C	Q J 7

South
S A 10 9 7 6 5
H Q J 5
D A Q 8
C 3

Garabed Zartarian offers the following solution.

Please place figure number 2 here.

N/D 2. In the diagram below C is a point inside an arbitrary triangle XYZ. Nicholas Strauss has drawn a line segment from X through C and ending on the opposite side at a point we call x. Similarly, he has drawn lines starting at Y and Z and ending at y and z. Show that

$$\frac{XC}{Xx} = \frac{YC}{Yy} = \frac{ZC}{Zz}$$

To quote John McNear ‘‘This is another problem suitable for a retired geometry teacher’’. He writes:

Please place figure number 3 here.

N/D 3. Joseph and Charles Horton have inscribed a hexagon with side lengths 2,2,2,11,11,11 in a circle of radius r. What is the value of r?

Rolph Person notes that this problem is a special case of Problem 100 in *Five Hundred Mathematical Challenges* published by the MAA in 1995. Charles Muehe and Joseph Wetherell have sent us rather different solutions, which are short enough for me to print both, beginning with Muehe's.

Please place figure number 4 here.

First note that we can swap adjacent segments without changing the diameter of the enclosing circle (cut off the portion of the circle encompassing the two segments and flip it over). So we can work with a

2,11,2,11,2,11 hexagon, which has better symmetry. If we connect every other vertex of this hexagon we get an equilateral triangle of side $r\sqrt{3}$. The small pieces of the hexagon that are cut off have side lengths 2, 11, $r\sqrt{3}$, and the angle between the 2 and the 11 sides is $2\pi/3$. Using the formula

$$r\sqrt{3} = \sqrt{2^2 + 11^2 - 2 \cdot 2 \cdot 11 \cdot \cos(2\pi/3)}$$

we now see that $r = 7$.

BETTER LATE THAN NEVER

1996 OC1 1. Mathew Fountain and someone named Dave have each shown that FREE(N), the maximal number of unattacked squares when N Queens are placed on an chess board of size N, grows as N^2.

OTHER RESPONDERS

Responses have also been received from R. Bart, G. Brenner and J. Shapiro, S. Buchthal, S. Feldman, J. Grossman, J. Harmse, R. Hess, W. Himmelberger, H. Huang, M. Ionescu, B. Margulies, A. Ornstein, T. Ralston, E. Reynolds, C. Rife, K. Rosato, R. Royer, E. Sard, D. Shapiro, H. Shaw, D. Sidney, N. Spencer, H. Stern, A. Wasserman, D. Wellington, N. Wickstrand, and M. Xue.

PROPOSER'S SOLUTION TO SPEED PROBLEM

Take the first Club trick with the Ace and lead the eight of Clubs. If West rises with the King, you have 12 tricks (three Spades, one Heart, five Diamonds and three Clubs). If West plays the nine, you win with the Jack, and now give East the King of Hearts. This way you make two Clubs and two Hearts for twelve tricks.