INTRODUCTION

Today is 19 August and I just returned from our annual family vacation on an island in Lake Winnipesaukee NH. This is a ‘‘family camp’’ run by the Boston YMCA that we have enjoyed each of the past 25 summers. I consider it somewhat remote (no internet access, 2 pay phones for 180 campers, etc.) but realized that everything is relevant when I received Dudley Church’s submission in which he remarked that his present location is ‘‘remote enough that carrier pigeons are a viable alternative to driving to a post box’’.

PROBLEMS

N/D 1. We begin with a bridge problem from Larry Kells who describes a ‘‘curious result in team-of-four bridge play’’ as follows. I was attending a team-of-four bridge tournament when I heard of the following curious result on a particular hand. At one table the contract was 3 spades doubled by South, made. At the other (using the exact same cards in each position) it was 3 spades doubled by East, made! I asked a member of the losing team how they managed to have 3 spades made against them in both directions. She diagrammed the deal and showed me how it was played at both tables; amazingly none of the defenders had made a mistake in play! Unfortunately I’ve lost the diagram. Can somebody restore it for me?

N/D 2. Paul Heckart sent us the following problem that he, Lars Sjodahl, and a third MIT student worked in 1932 or 33 at Walker Memorial. If I remember correctly, that is the building where group ‘‘freshman exams’’ were given during my first year (1967-68).

Draw a regular five point star. Draw a circle through the five points. Now notice that the lines connecting alternate points intersect in a pentagon. Draw a second circle circumscribing this pentagon. It will have the same center as the first circle. Finally draw a third circle that passes through two of the points of the star and the common center of the other two circles. This third circle is median in size from the other two. Show that the radius of the first circle is the sum of the radii of the second and third circles, if possible using only straight edge and compass.

N/D 3. Ken Rosata is puzzled by the following two diagrams he saw in *Gaming Theory* while in Las Vegas. What happened to the blank square in the first figure?

Please place figure number 1 here.

SPEED DEPARTMENT

Some more chemical quickies, these from Alvin Guttag. What are the following chemicals?

$$(BaNa_2S)_{12}$$

$$\frac{NaCl\,aq + NaCl\,aq}{C_7}$$

What chemical is the perfect contraceptive?

SOLUTIONS

J/A 1. As a sequel to M/A1, Larry Kells offers us one entitled ''The Husband Gets Revenge''

Peace has come to the bridge club at last. The couple that kept arguing over the husband's doubles that didn't work out-- the tables got turned! I'm sure that after what happened last week, we'll never again hear any criticism from the wife over a failed double. (Not that they've stopped losing, just that she was the one who got bit this time!)

I heard the husband say calmly, ''One Spade redoubled and made, game and rubber. No way to beat it. And YOU were the one who doubled.'' The wife kept saying over and over in robot-like tones, ''Ace-king-queen-jack-ten-nine-seven of spades and 20 points... Ace-king-queen-jack-ten-nine-seven of spades and 20 points...'' But I didn't see the hand, does anyone know what it could have been?

Several responders found similar solutions. I selected David Cipolla's as it is neatly typed, represents his first submission, and has a cute finale.

North

S	Void
H	xx
D	xx
C	AKJxxxxxx

West

S	Void
H	xxxxxx
D	xxxxxxx
C	Void

East

S	AKQJT97
H	KJ
D	KJ
C	Qx

South

S	865432
H	AQx
D	AQ
C	xx

On either red suit lead from West, South wins and cashes his remaining honor in that suit. South leads a club and wins in dummy with the Ace. The other red suit is led, with South taking his honor after finessing through East. He plays his remaining honor in that suit and finally leads his last club to dummy's King.

Upon leading a club, East must play a trump. If East plays his 7, South plays his 8 for his side's seventh and last winner. If East plays a high trump, South discards his remaining heart. With East down to nothing but trumps, South can wait to play his 8 over East's 7. One spade redoubled and made.

West and North must both be void in spades to ensure that South has six trump to East's seven. West also must be void in clubs so that he is forced to lead a red suit. A club lead would only give South one entry back to dummy when two are needed. Finally, the husband shouldn't be berating his wife but instead should be applauding her because her failed double kept North-South from a cold 7 club slam.

J/A 2. This is a problem in frequency modulation from Paul Griffith. Given the equation $\sin(\omega t)$ where

$\omega = 2\pi f$, determine the frequency vs. time function f(t) such that at t=0 the frequency is 4.1 Hz and at the end of 5 seconds the frequency is 9.1 Hz. Let this variation be linear. Now determine whether the next cycle starting at t=5 is a positive- or a negative-going sinusoid (not quite a perfect sinusoid because the frequency is still varying with time). The answer sought is either positive sinusoid or negative sinusoid.

Oh boy. I am not an expert in this area so it is with some fear and trepidation that I proceed. First, there was clearly a typo in the problem: $2\pi/f$ should have been $2\pi f$. However, nearly everyone caught the typo and fixed it. The fear and trepidation on my part concerns the fact that the Griffith, the proposer, predicted that most readers would incorrectly conclude that the answer was ‘‘negative sinusoid’’. Indeed most readers did come to this conclusion. The following rather simple solution (which gives the according-to-Griffith correct answer) comes from Matthew Fountain.

The frequency $f = 4.1 + t$. During the 5 second period the average $f = (4.1 + 9.1)/2 = 6.5$ and the number of cycles is (6.5)(5)=33. As $\sin(2\pi ft)$ is sinusoidal positive at t=0, so is it positive after 33 complete cycles.

J/A 3. Bob High writes that on a recent visit to my brother’s family, I discovered my niece Melinda absorbed in a new toy she had acquired, called Linx. Linx consists of a set of 8 semicircular plastic hoops, of diameters 2 to 9 inches. There is also a plastic strip with 16 hinges at 1-inch intervals, to which the ends of the hoops can be linked. The object is to link all 8 hoops to the strip, with each hoop lying flat on one side or the other of the strip, and no two hoops overlapping.

Ooze, please insert figure from J/A

When I came upon Melinda she had indeed linked all the hoops as above (see diagram), and I congratulated her. She looked at me in scorn and said, ‘‘That part is easy. Now I’m trying to do the Colorlinx puzzle!’’ I then noted that the hoops were of four colors: in ascending order of size they were Red, Green, Blue, Yellow, Red, Green, Blue and Yellow. Melinda explained that the object was to link all the hoops as before, but with no two loops of the same color next to each other, that is, joined to hinges that are next to each other on the strip.

We spent a pleasant half-hour experimenting together before finally finding the solution. What was it? (I should note that Melinda, being a methodical child, always arranged the loops such that of the two loops at the ends of the strip, the larger one should appear at the left end and above the strip.)

The following solution is from Robert Harley. Each hoop is labeled with its length and each hinge on the strip is labeled with the color of the hoop joined there.

Please place figure number 2 here.

BETTER LATE THAN NEVER

M/A 3. Mark Snyder has found a shorter solution.

1997 F/M 3. Donald Savage notes that the published solution has several pentominos repeated and 4 pentominos do not appear. His computer found the following improved solution.

Please place figure number 3 here.

OTHER RESPONDERS

Responses have also been received from Auran, R. Bishop, T. Coradetti, J. Feil, R. Giovanniello, R. Hess, B. Layton, A. Lowenstern, E. Marmar, C. Muehe, J. Prussing, D. Schwarzkopf, S. Sperry, D. VanPatter and C. Wiegert.

PROPOSER'S SOLUTION TO SPEED PROBLEM

A dozen bananas. Sailing, sailing over the seven seas (salt and water gives saline). Hexanitrosobenzene, since it says no in all positions.