PuzzleCorner

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 a multi-year supply of regular problems, and over a year of speed problems. Bridge problems, however, are in short supply, and I have no chess or go problems. Computer problems are now considered regular problems.

I write this issue the first business day of the new year and wish you all a healthy and productive 1995. This year will include a personal milestone for me: I was born in 1945, so will cross into my second half-century this August.

Problems

Apr 1. Winslow Hartford sends us the following Sheinwold problem in which South is declarer at 6 hearts and is to make the contract against a lead of the D7.

North
♠ Q 10 8 6 3 2
♥ A J 4
♦ 4 2
♣ Q 7

West
♠ 9 7 4
♥ 8 7 6 5
♦ 7
♣ K 6 4 3 2

East
♠ K 5
♥ None
♦ K J 9 6 5 3
♣ A J 10 9 8

South
♠ A J
♥ K Q 10 9 3 2
♦ A Q 10 8
♣ 5

Apr 2. Nebraska was just named the national champion in college football, bringing great cheer to Lincoln but much sadness to State College. Jerry Grossman asks us to show that round-robin tournaments always have at least one player "transitively better" than everyone else. Specifically, Grossman writes:

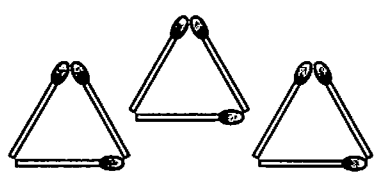
A round-robin tournament was held among n players, each player playing one game against every other player. No game ended in a tie. Show that there exists a player K such that for every other player L, either K beat L, or K beat someone who beat L.

Apr 3. Robert Moeser has one that he suggests you solve by hand for N≤5, but use a computer if you want to try larger N. Use N identical cubes and create a solid object by joining them only by gluing a face against another face such that the two faces are in perfect alignment. Consider that two such objects are identical if one can be rotated and placed in exact correspondence with the other. (Objects that are mirror images, however, are considered different.)

How many different objects can be made with N = 1, 2, 3, 4... cubes?

Speed Department

Nob. Yoshigahara wants you to move two matches so that no triangle remains.



Solutions

N/D 1. Larry Kells writes that while kibitzing a high-stakes game, he saw declarer bid and make 7 no-trump redoubled and vulnerable. In the aftermath, the defenders, a married couple, were arguing heatedly:

Wife: How many times do I have to tell you to stop making those risky speculative doubles? You've cost us thousands of dollars that way!

Husband: But I had 26 points. I thought I could beat 7 no-trump.

Wife: You see perfectly well that we had no defense. Next time don't double 7NT in that position unless you have all four suits completely stopped!

Assuming they were both telling the truth, reconstruct the deal.

The following solution is from Len Schaider: Let South be the declarer at 7NT redoubled; East is the husband with 26 points; West is his wife. E/W cannot have all four aces or the contract will be defeated. Since West has 26 points, N/S cannot have all the aces. If N/S have only one ace, they would need 13 cards in that suit to win, but the opponents could not lead that suit! If N/S had two aces, they would probably hold AK in two suits for the 14 points. However, this does not provide any possible solutions. What does work is for N/S to have three aces and one Q for their 14 points, and for West to be void in the suit in which East has the ace.

North
♠ xxxxxxx
♥ ATx
♦ AT
♣ x

West
♠ (void)
♥ xxxxxx
♦ xxxxxxx
♣ (void)

East
♠ AKQJx
♥ KQJ
♦ KQJ
♣ KJ

South
♠ x
♥ x
♦ x
♣ AQxxxxxxxx

Assume West leads a diamond. North plays the ace and leads a club, finessing East. South then leads the last club honor and plays the remaining eight clubs. North discards spades and red cards but keeps the AT of hearts.

After South and North play their 11th card, East has a problem discarding.

North
♥ AT

East
♠ A
♥ KQ

South
♠ x
♥ x

If East discards the ace of spades, then South will play a spade and lead to the ace of hearts. If East discards a heart honor, then South will lead to the ace of hearts and the ten of hearts will be good. (Since West may still have a heart, it is necessary for North to have been dealt both red tens.)

The overall play is the same if West leads a heart; in that case both North and East will keep diamonds.

N/D 2. Nob Yoshigahara wants you to solve the following criptarithmetic problem.

```
       A
      AA
     AAA
    AAAA
   AAAAA
  AAAAAA
 AAAAAAA
AAAAAAAA
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BCDEFGHI
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The following solution is from Zale Zussman:

For any A≤4, B=A, which isn't allowed under usual cryptarithmetic rules (3A plus carry is no more than 13, so 2A plus carry is no more than 9). That leaves only 5 digits to try for A, with the solution given whenever BCDEFGHI are all

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*SEND PROBLEMS, SOLUTIONS, AND COMMENTS TO: ALLAN GOTTLIEB
NEW YORK UNIVERSITY
715 BROADWAY, 10TH FLOOR
NEW YORK, N.Y. 10012,
OR TO: GOTTLIEB@NYU.EDU*

Puzzle

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distinct. As luck would have it, success comes swiftly, because there is an answer for A=5. BCDEFGHI is found to be 61728390. 6, 7, 8, 9, don't work. I note that BCDEFGHI turns out to be two digits short of a Wellesley phone number—perhaps an old girlfriend?

N/D 3. Martin Kalinski, a former Baker House colleague, asks a common question about palindromes. Kalinski reminds us that a palindrome is a positive integer that reads the same right to left as left to right. For example, 121 and 1331 are palindromes. Take a non-palindrome like 57 and add to its reverse: 57+75=132. Keep going and get 132+231=363, which is a palindrome. Will this procedure always yield a palindrome? Note that it is easy to find numbers that do not yield a palindrome after two applications of "adding the number to its reverse." The question is are there any numbers that never yield a palindrome?

I did not receive a real proof for this one. Matthew Fountain notes that the required lack of carries is less likely to occur for large numbers so that if a number does not become palindromic "soon," it is not likely to become one ever. Fountain applied the Kalinski procedure to the number 196 until the result exceeded 10,000 digits and no palindrome was produced. George Blondin asserts that 196 is the smallest number that *never* becomes palindromic, but did not submit a proof. Blondin also asserts that 12 other numbers under 1,000 never become a palindrome.

Better Late Than Never

M/J 3. Charles Wampler writes "The 'trepidation' you mention in publishing the solution to M/J 3 is well-founded, as I imagine you are going to get a few comments on this one!" Indeed, I did. Richard Hess writes "Your solution was correct but I believe not for the problem Bob [High] intended. I believe he meant to [have the ball roll on] a *horizontal* circle as opposed to the vertical case you solved". I agree with Hess and must confess that I never thought of the horizontal case. Finally, among other correct solutions to High's intended problem, came the following from Naoaki Takashima.

The performance of a billiard ball rolling around a circle without slipping and twisting is exactly identical to that of a rolling cone with proper peak angle as shown in Figure 1. Figure 2 shows Nob Yoshigahara's similar model of a rolling umbrella instead of a rolling cone. As shown in Figure 3, the trace of contact on the ball is a circle whose diameter is $1/\sqrt{2}$ times of the diameter of the ball. Thus $\sqrt{2}$ revolutions of the ball around the axis CO is made when the ball is returned to the original position after rolling around the circle, and the location of black dot became P_1 (or P_1').

The black dot is never returned to the initial position (Po) after any number of times of rolling around the circle!

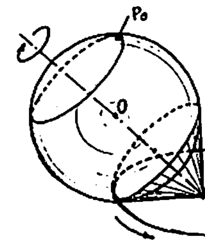


Fig. 1 Concept of rolling ball

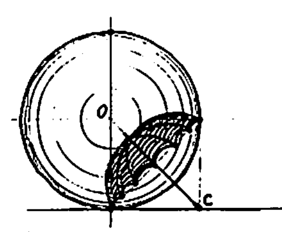


Fig. 2 Nob's umbrella model

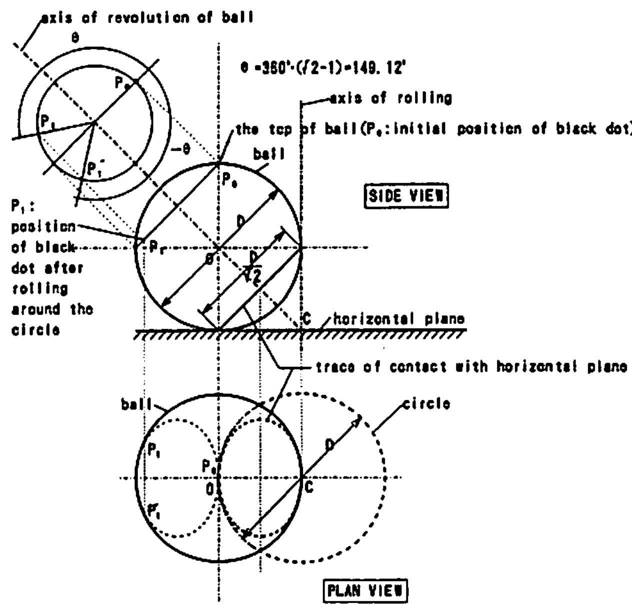
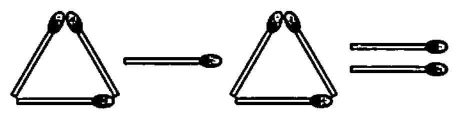


Fig. 3

Other Responders

Responses have also been received from W. Anderson, W. Deane, S. Feldman, M. Fountain, R, Hendrick, A. Julian, J. Keilin, J. Miller, L. Nissim, G. Orenstein, A. Orvistein, K. Rosato, E. Sard, and M. Wand.

Proposer's Solution to Speed Problem



Year by the Georgia-based Business and Technology Alliance.

I received a much welcome letter from Douglas Falkenburg: "I am running IMTI Systems, the industry leader in Loss Control and Safety Engineering software for the insurance industry. Founded by myself in 1979, we now have 15 people and count most major property and casualty insurers as our clients. And our field software keeps workers safe and protects buildings from fire and other disasters. Wife Cheryl coded a new arrival last August, Grant Evan—gives me a backup heir apparent should his older brother, Julian (29 months), abdicate. In addition, I am the proud father of a four-month old Harley 1200 Sportster, lotsa chrome and *very* loud pipes. Can a tattoo be far behind? And still hacking around with folk and country guitar."

That's all for now. Hope to see you all at the reunion.—Jennifer Gordon, secretary, 18 Montgomery Pl., Brooklyn, NY 11215

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We are fortunate this month to have a nice assortment of news, both via post and e-mail. Please continue to write.

Lee Silberman writes, "In July, my wife and I adopted a newborn daughter, Clara Michelle. Our 8-year-old son is upset that we did not bring home an older brother. As we only had 24 hours notice before getting Clara, our summer was very hectic and lots of fun. For anyone who is thinking of adopting, *do not believe the stories that healthy babies are hard to get.* All you need to do is find a good agency, fill out one ton of paperwork, and wait patiently for *less* than 18 months. (Emphasis, Lee's.)". . . Rachel Powsner is "working in nuclear medicine in Boston. My husband, Ronald Gurrera, and I just celebrated our eighth wedding anniversary.". . . Todd Mojesky now lives in Canada, and writes, "The mountains are amazing, and the oil industry here in Canada isn't bad either."

From Michael Baumann: "Still in Washington, D.C., working for an economic consulting firm, Economists, Inc. While who is 'in' affects my work, fortunately it doesn't effect my employment. I've spent the past two years dealing with cable-rate reregulation. Who knows, the new Congress may bring rate rederegulation.". . . Fred Tsuchiya is "at MTS Systems still (16th year). Other alumni at MTS George Butzow, '51, retired as chairman of