As Timothy Chow and Lyman Hurd guessed, my forbidding 0^0 in the yearly problems marks me as someone whose mathematical training emphasized analysis, continuity, and real numbers over combinatorics, set theory, and integers. For those interested in both sides of the argument, Chow recommends faqs.org/faqs/scith-faq/specialnumbers/0to0. Greg Marks and the mother and uncle of Edwin Kruse apparently share my analytical preferences.

I am celebrating my third silver anniversary this month. The first occurred in 1991 (or 1990 if you include *Tech Engineering News*) when "Puzzle Corner" was 25 years old; Alice and I had our 25th wedding anniversary on Jan. 7, 1997; and this month completes my 25th year at NYU.

Speed Department

Victor Barocas sent us several so-called Tom Swifties. Fill in the blanks. The answer to the first one is "meanly."

"You idiot, it's the average," said Tom ____.
"This reminds me of a story about trigonometry," said Tom ____.
"The angle is less than 90 degrees," said Tom ____.
"We need to revise our square root symbol," said Tom ____.
"It's perpendicular to the surface," said Tom in his ____ voice.
"The distribution fits a Gaussian curve," said Tom in his ____ voice.

and my personal favorite:

"I wish Larry Kells would ask about an older game," said Tom ____.

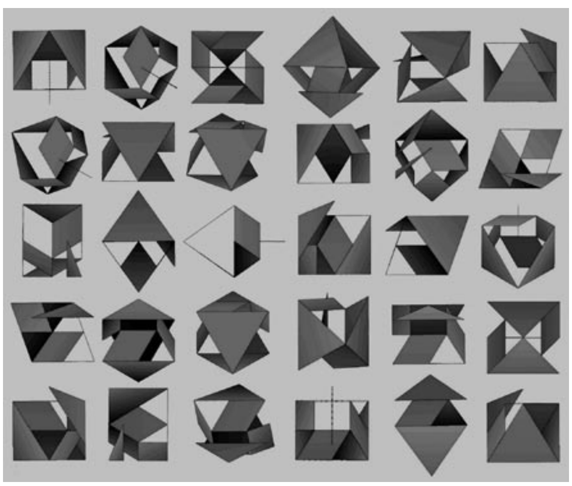
Problems

JUL 1. Larry Kells offers a problem attributed to Moses Ma that "trumps" previous problems of ours of the same genre.

"I just heard from my friend again after a long absence. He breathlessly told me how he and his wife were playing a Swiss team and bid and made four spades redoubled. At the other table, their teammates (playing the opposite cards) bid four spades redoubled–and made five! While the opposing team had many recriminations over their bidding, there was nothing to fault about their defensive play. In your column, you once showed a deal where the *defenders* against four spades will take 10 tricks on one side and 11 on the other. But they have the advantage of the opening lead. Also, you published a solution where both sides can make three spades doubled. But on this deal, both sides made four spades redoubled, one with an overtrick! Anybody care to try it?"

JUL 2. Avi Ornstein has circumscribed a triangle around a radius 1 circle. What is the minimum area Avi's triangle can have?

JUL 3. Samuel Verbiese wants to know what this series of pictures suggests to you:



Solutions

MAR 1. Our first regular problem is a bridge offering from Larry Kells, who has been thinking about guaranteed contracts, i.e., single hands strong enough to guarantee that a certain contract is makable with best play for any distribution of the remaining cards. He specifically asks if there is any guaranteed suit contract in which the visible hand contains fewer than seven cards of that suit.

The consensus is that, holding only six trumps, seven tricks (or a bid of 1 in a suit) is the best possible result. Respondents differed in the six-trump hand used. The following, from Bob Wake, is the weakest hand found.

♠ A K Q J T 2
♥ A
♦ A
♣ A T 9 7 2

Five high spades are necessary if the defense begins heart ruff, diamond ruff, club ruff, high diamond. South can't discard because that only postpones the pain (assuming no help from dummy) and has to ruff high because getting overruffed by West's singleton trump will hold South to five spades and the ace of clubs. Five high spades are sufficient because now South can ruff high, draw trumps, and claim six spades and the ace of clubs. Same if W is void in both red suits, E is void in clubs, and E/W begin by cross-ruffing the first five tricks.

Five high spades are also sufficient on any passive defense, because once South gets in, South can draw four rounds of trumps and either (a) finish drawing trumps and claim seven to nine tricks (depending on how many aces got ruffed before South could get in) or, (b) if South has T2 of trumps, and one defender still has two or three trumps, start playing side-suit aces, eventually getting either two aces and the five high trumps or one ace and all six trumps.

So where things get interesting is if East ruffs the heart opening lead and shifts to clubs. We can see that AT8xx or better is necessary, even double-dummy, because if each defender has at least two spades, W is void in clubs, and E is void in both red suits and has KQJ98 of clubs, then E/W can take seven tricks by brute force by taking two ruffing finesses in clubs.

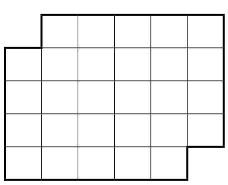
So what's sufficient if South's clubs are headed by the ace-10? Suppose East plays the king of clubs at trick two. If South ducks, East plays the queen, and if South ducks again, East plays low. Now either West wins the jack, club ruff, diamond ruff, club ruff, down one, or West ruffs the ace, diamond ruff, club ruff, and East gets the jack of clubs eventually for down one.

So South needs to *cover* either the first or second high club with *any* club suit headed by the ace-10, which West will naturally ruff, since otherwise South has seven easy tricks. With only five spades outstanding, South also has seven easy tricks at this point unless East can now ruff the ace of diamonds and send another club through. Now, if East's clubs are KQJ87 or better and West has another trump, West can send the 8 of clubs through, forcing South to cover, West ruffs, and South is endplayed for down one.

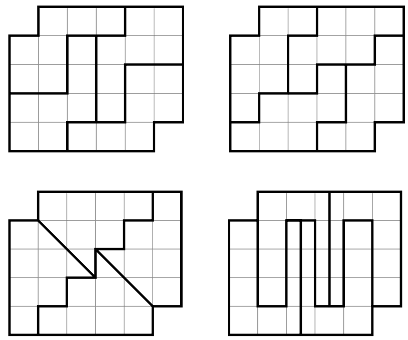
Therefore South needs at least AT97 of clubs, and all that remains is to show that AT972 of clubs can withstand the one defense we have not yet considered, where East ruffs the opening heart lead and leads a *low* club. South obviously has to play the 7, which means West will obviously win the 8. If West then gives East a club ruff, then E/W get at most six tricks before South gets in, draws trumps, and claims. But if West gives East a diamond ruff at trick three, East must lead a high club at trick four, because South is home free if West ruffs the 9 of clubs. South can safely hold up once or even twice, because we just learned that East started with seven clubs, which means East's 8 was a singleton, and losing another club trick to West before trick 7 is harmless anyway.

But endplays are more fun, so cover the first high club. West ruffs, has to lead a trump or a red card, and now South runs the spades, and the last three tricks find South on lead with T92 of clubs and East about to be thrown in with QJ6.

MAR 2. The October 1987 issue of the *Johns Hopkins Magazine* contained an installment of "Golomb's Gambits," by Solomon Golomb. That month the gambits were entitled "Figures drawn and quartered" and included the following puzzle. Divide the figure below into four congruent pieces. The grid lines indicate the shape, but your cuts need not be along the grid. There are four distinct solutions: how many can you find?



Richard Hess found all four, the last of which is pretty clever. I confess to not having thought of cuts that don't terminate at grid points.



Better late than never

2004 J/A 3. Joel Karnofsky points out that (5, 22, 23, 24) is an additional answer to part a. He points out that this illustrates an advantage of choosing computer-generated solutions over those based on logical reasoning for problems with finite but large search spaces. I am forced to agree and will try to remember, if I again choose a noncomputer solution for such a problem, to confirm that the answers agree (or try to figure out why not).

OCT 1. Ralph Cuomo noticed that East, not West, should be on the lead. I am not an expert, but I believe that, if we switch the East and West hands and interchange usage of "East" and "West" in the play, all is well.

OCT 3. Albert Mullin noticed that this problem is the same as his problem E-2459 in the February 1974 *American Mathematical Monthly*. Interestingly enough, our answer improves on the one in the *Monthly*.

Y2004. Michael Godin, Joel Karnofsky, John Prussing, and Ermanno Signorelli found the following corrections and improvements to the published solution.

$3 = 2 + 40^0$
$8 = 2 * (0 + 0 + 4)$
$41 = 2^0 + 40$

Other responders

Responses have also been received from S. Gorovitz, R. Ackerberg, K. Rosato, R. Giovanniello, G. Coram, T. Harriman.

Proposer's solution to speed problem

Meanly; tangentially; acutely; radically; normal; normal; wistfully.

Send problems, solutions, and comments to Allan Gottlieb, New York University, 715 Broadway, 7th Floor, New York NY 10003, or to gottlieb@nyu.edu.