I begin with an apology. As you have doubtless noticed, *Technology Review* has had a stylistic face-lift. Unfortunately, I failed to observe that a casualty of the redesign was my contact information, which was not present in the January/February issue. A few readers whose detective work successfully located my address alerted me to the omission just in time for the magazine to squeeze the information into the March/April issue, which was already with the printer. To quote Mark Bolotin: "[Improving the solution] is not as interesting as solving the problem ... or as finding your e-mail address."

I imagine that those who were unable to find the address had less gentle remarks to make. Once again, my apologies.

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 comfortable supply of regular problems and bridge/chess problems and about a year's worth of speed problems.

As you may recall from past columns, my son David now lives in San Diego with his lovely wife, Sarah Simmons. David reports that at the end of February, the MIT Club of San Diego had an event featuring Oliver Smoot. Yes, it was *the* Oliver Smoot of Harvard Bridge fame.

Smoot addressed several of the burning issues of our time. I'll skip climate change, world peace, and curing cancer to get to the big ones right away. He indeed was laid out 364-plus times, as reported on Wikipedia, with many of the last measurements requiring his fraternity brothers to carry him from point to point. This puts to rest the scandalous suggestions I had heard that a board was cut and repeatedly laid out along the bridge.

Why Smoot? That is, why not another Lambda Chi Alpha pledge? Because his name works so well as a unit of length? No, because he was the shortest.

Why is the bridge from Boston to MIT called the Harvard Bridge? Smoot reports that when the original bridge design was unveiled, with the possible name of "MIT Bridge," some MIT official didn't like the design and thus felt it would be better named after Harvard.

David tells me that several of the MIT Club members, having read this column and thereby knowing his whereabouts, came up to him to say that they are faithful readers of "Puzzle Corner." I appreciate their kind words.

Finally, David reports that Smoot looked very good, especially considering that as a member of the Class of 1962, he is "even older than you."

## PROBLEMS

**M/J 1.** Larry Kells wants you to adapt my Pollyanna-like view of life to the world of bridge. He writes,

"As a result of a bidding misunderstanding, you have arrived in seven hearts with the following hands. Your mission, should you decide to accept it, is to find a line of play that gives you a chance *[albeit small —Ed.]* of making it (against best defense), after the lead of a spade."

North
♠ 6 5 3
♥ K 4 2
♦ A J
♣ A 9 5 4 2

South
♠ A 7 4
♥ A J 9 3
♦ K 8 4 2
♣ K 3

**M/J 2.** Edwin Field has a tetrahedron in which all six edges are perfect one-ohm resistors and the faces and interior have infinite resistance. What is the resistance measured between any two vertices?

**M/J 3.** Donald Aucamp and Joyce Sabine offer the following method for checking the multiplication of positive integers. Reduce a (positive) integer $X$ to $D(X)$ by adding all the digits of $X$ and repeating the process until a single digit results. Then a requirement for $A \times B = C$ is that $D(D(A) \times D(B)) = D(C)$.

As an example, let's check if $6{,}843 \times 401 = 2{,}744{,}043$.

$$D(A)\text{: } 6{,}843 \rightarrow 6+8+4+3=21 \rightarrow 2+1=3$$
$$D(B)\text{: } 401 \rightarrow 4+0+1=5$$
$$D(C)\text{: } 2{,}744{,}043 \rightarrow 2+7+4+4+0+4+3=24 \rightarrow 2+4=6$$
$$D(D(A)\times D(B))\text{: } 3\times 5=15 \rightarrow 1+5=6$$

Show that this procedure always works, or give an example where it fails.

## SPEED DEPARTMENT

David Hoffman wants you to combine 100, 193, and $\log_{10} 11{,}222.11122$ to approximate $\log_{10} \pi$. He supplies the hint that $\log_{10} \pi \approx 0.5$.

## SOLUTIONS

**J/F 1.** An unusual bridge problem in which both declarer and the defenders try to get the minimum number of tricks. Perhaps Larry Kells thought of this because that's how he views his friends' play (or how they view his).

What is the weakest combined holding (high-card points) that North-South can have and still make seven spades with worst play on all sides? What about seven no-trump?

Apparently Mark Bolotin is quite good at losing tricks with good hands, as he makes it look so easy. For no-trump, Bolotin gives the opponents all but three points; for a suit contract, all but six.

North
♠ 3 2
♥ 3 2
♦ 5 4 3 2
♣ 6 5 4 3 2

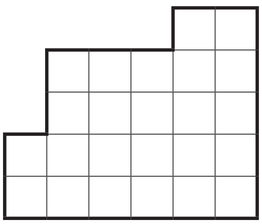
West
♠ A K Q 7 6 5 4
♥ –
♦ A K Q 8 7 6
♣ –

East
♠ –
♥ A K Q 7 6 5 4
♦ –
♣ A K Q J 8 7

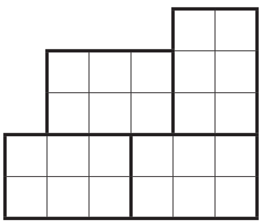
South
♠ J 10 9 8
♥ J 10 9 8
♦ J 10 9
♣ 10 9

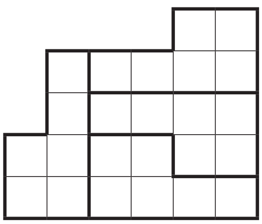
It is an easy matter for East-West to duck every trick and let South make seven no-trump.

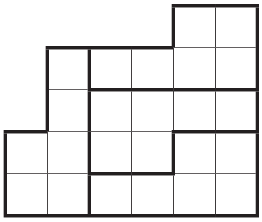
**J/F 2.** The following problem first appeared in the October 1987 *Johns Hopkins Magazine*, in "Golomb's Gambits" by Solomon Golomb. Divide the figure below into four congruent pieces. There are two solutions.



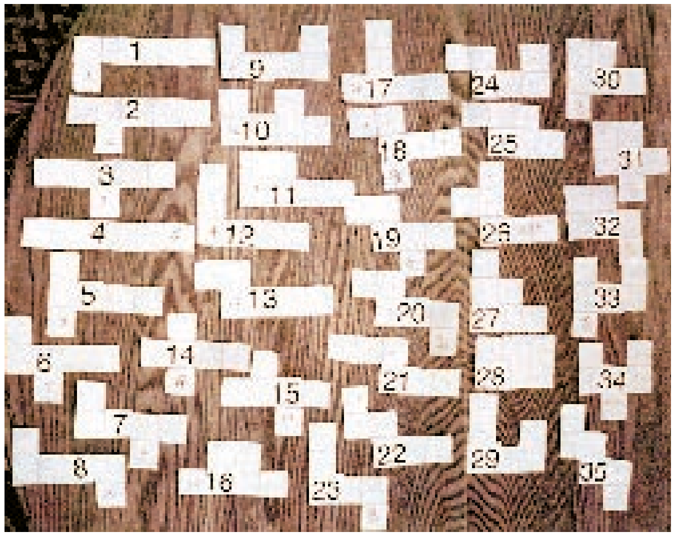
Depending on how you count, Alan Taylor might have found three solutions, as shown in the following diagrams.







When solving this problem, Alan Faller first constructed (literally, as shown in the photograph below) the 35 "independent" hexominoes. He actually began with the 12 independent pentominoes and their six mirror images and considered adding one square to each, giving 178 possible hexominoes, which a program reduced to the 35 below and 25 mirror images.



**OTHER RESPONDERS**

Responses have also been received from R. Ackerberg, A. Brosoff, R. Giovanniello, R. Hess, C. Larson, N. Markovitz, J. Newman, A. Ornstein, K. Rosato, A. Sahai, C. Sanders, S. Silberberg, and G. Sydnor.

**PROPOSER'S SOLUTION TO SPEED PROBLEM**

$$\frac{100 - \log_{10} 11{,}222.11122}{193}$$

Seeking approximately 0.5, we notice that 100/193 is a little big and $\log_{10}$ 11,222.11122 is about 4. In fact (100-4)/193 approximates $\log_{10} \pi$ to 3 significant digits, and the full answer above does so to 10. ■

Send problems, solutions, and comments to Allan Gottlieb, New York University, 715 Broadway, Room 712, New York NY 10003, or to gottlieb@nyu.edu.