Carl A. Segerstrom, Jr., '39; March 10, 1993; Winchester, Mass.

Gereld L. Tawney, ScD '39; December 22, 1992; Santa Barbara, Calif.

George J. Thomas, '39; February 16, 1993; New Bedford, Mass.

Joseph F. Libsch, '40, SM '40, ScD '41; January 4, 1993; Bethlehem, Pa.

Adolph L. Sebell, '40; February 1, 1993; Fayetteville, N.Y.

Leslie A. Sutton, '40; February 8, 1993

William R. White, '40; July 24, 1992

Irving J. Foote, '41; December 18, 1992; Berea, Ohio

Irving Stein, '41; January 19, 1993; Arlington, Mass.

Guillermo G. Arce, '42; October 9, 1992; Jalisco, Mexico

Donald P. Greatorex, '42; December 25, 1992; Tequesta, Fla.

William A. Rote, '42; January 13, 1993; Sarasota, Fla.

Ovide V. Fortier, Jr., '43; February 5, 1993; Falmouth, Mass.

Theodore Gunlock, '43; August 7, 1990; Encino, Calif.

Earl J. Mathewson, Jr., '43; December 31, 1992; Lincoln, R.I.

Edward H. McLaughlin, Jr., '43; November 19, 1992; Los Angeles, Calif.

James S. Ruoff, '44, SM '48; January 12, 1993; Rochester, N.Y.

Andrew J. Schmitz, Jr., '44; November 21, 1992; Huntington, N.Y.

Raymond D. Brown, Jr., '46; December 29, 1992; Scarsdale, N.Y.

Wasudeo S. Rajadhyaksha, SM '46; August 10, 1989; Bombay, India

Donald E. Boynton, SM '47; ScD '49; December 23, 1992; Kennett Square, Pa.

Joseph C. Hobaica, '47; February 23, 1993; North Easton, Mass.

William L. Starnes, SM '47; February 3, 1993; San Antonio, Tex.

William R. Chalker, SM '48, MET '49; April 9, 1992; Ocean City, N.J.

Nilo A. Lindgren, '48; December 24, 1992

Earl K. Solenberger, '48; January 24, 1993; Petersburg, Va.

Irving Steinhardt, '48; September 26, 1992; Miami, Fla.

Frank P. Omohundro, NE '49; February 6, 1993; Ponte Vedra Beach, Fla.

Rush Taggart, '49; January 11, 1993; Stock-bridge, Mass.

Harold E. Williamson, SM '49; February 12, 1993; Truckee, Calif.

Clarence F. Picard, '50; May 28, 1992; Capitola, Calif.

Lee S. Brodsky, '51; September 2, 1992

Gilbert G. Clarke, '51; December 8, 1991; Gladwyne, Pa.

Seldon B. Spangler, Jr., '51, SM '52; February 12, 1993; Los Altos, Calif.

Robert M. Mix, SM '52; December 12, 1992; San Diego, Calif.

Raymond H. Morth, '52, SM '53; January 27, 1993; Sudbury, Mass.

Donald J. Spooner, SM '52; January 6, 1992; Honeoye Falls, N.Y.

Frederick H. Bowis, '54; February 21, 1993; Bethesda, Md.

Brian T. Hastings, SM '54; March 4, 1993; Boston, Mass.

William H. Ryer, '54; January 7, 1993; Winchester, Mass.

John C. Eddison, PhD '55; January 22, 1993; Lexington, Mass.

Arthur B. Hersberger, '56; September 25, 1992; Haverford, Pa.

Solomon J. Buchsbaum, PhD '57; March 8, 1993; Westfield, N.J.

Frank W. Burr, '57; May 4, 1992; Teaneck, N.J.

Roger W. Kapp, '58; August 1, 1992; New York, N.Y.

Richard A.P. Thoft, '58; February 20, 1993; Pittsburgh, Pa.

Hubertus J. Weinitschke, PhD '58; December 5, 1992; Erlangen, Germany

Daniel F. Cameron, SM '59; March 28, 1992; Edmonds, Wash.

Norman A. Fujiyoshi, '59; October 11, 1992; Braintree, Mass.

Granville H. Sewell, '59; PhD '66; December 24, 1992; Englewood, N.J.

Herb S. Holdsambeck, SM '60; October 5, 1992; Huntsville, Ala.

Peter Buttner, '61; SM '78; January 17, 1993; Brattleboro, Vt.

Stephen E. Amador, '62; October 22, 1992; Plymouth, Mich.

Richard M. Hacker, '62; September 13, 1992

Edward G. Kondas, '62; October 6, 1991; Cleveland, Ohio

John P. Morenski, '62; January 24, 1993; Lynnfield, Mass.

Kenneth H. Cutt, '65; October 5, 1992; Toronto, Canada

Bengt I:son Sjogren, '66; November 10, 1992; Stocksund, Sweden

Edwin F. Alder, '67; March 6, 1992; Indianapolis, Ind.

Robert K. Treichler, '67; October 17, 1991; Williamsburg, Va.

Sandra A. Skiba, '68; October 13, 1990; St. Louis, Mo.

Dana B. Pettengill, '71, SM '73; January 8, 1993; Palo Alto, Calif.

John K. Wooten III, '71; June 11, 1991; Los Alamos, N.M.

George T. Chiu, PhD '73; September 3, 1992; Wappingers Falls, N.Y.

George T. Richardson, '75; January 24, 1992; New Iberia, La.

Nicholas J. Penny, SM '87; June 23, 1992; Cape Town, South Africa

Faith VanNice, PhD '89; January 3, 1993; Roxbury, Mass.

Robert H. Graulich, '91; September 1, 1992; Canandaigua, N.Y.

CORRECTION: Dimitri N. Kazarinoff, '85, was erroneously reported as deceased in the May/June issue. (See Class of '85 Notes this issue.) We regret the error.—Ed.

It has been a year since I reviewed the criteria used to select solutions for publication. Let me do so now.

As responses to problems arrive, they are simply put together in neat piles, with no regard to their date of arrival or postmark. When it is time for me to write the column in which solutions are to appear, I first weed out erroneous and illegible responses. For difficult problems, this may be enough; the most publishable solution becomes obvious. Usually, however, many responses still remain. I next try to select a solution that supplies an appropriate amount of detail and that includes a minimal number of characters that are hard to set in type. A particularly elegant solution is, of course, preferred as are contributions from correspondents whose solutions have not previously appeared. I also favor solutions that are neatly written, typed, or sent via e-mail, since these produce fewer typesetting errors.

Problems

JUL 1. We begin with a well-known computer problem suggested by the late Robert High.

In your favorite programming language (C, Lisp, Apl, etc.) write a program that, when run, produces output that is an exact copy of its own source code. Calls to system functions to "echo" the source from a file are not in the spirit of the problem!

JUL 2. A "classic" from Gordon Rice.

While cleaning out my office for retirement, I came across my freshman physics text: *Introduction to Mechanics and Heat* (2nd edition, 1939), by N.H. Frank. On page 204 is the following gem:

A slender homogeneous rod of length 60 cm., resting on a perfectly smooth horizontal surface, is struck a blow at right angles to the length of the rod at one end of the rod. Find the distance through which the center of the rod moves while it makes one complete revolution.
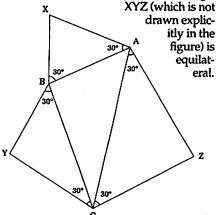
Tell A Gram or Two

JUL 3. Consider an arbitrary triangle ABC, as shown in the figure below. From each of the vertices, extend two lines on the exterior of the triangle, each at a 30-degree angle from the sides. These lines intersect at the points X, Y, and Z opposite sides AB, BC, and CA. Show that triangle XYZ (which is not drawn explicitly in the figure) is equilateral.

Speed Department

There are 10 jars of coins, each with an indeterminate number (large), but the jars all weigh the same. Nine of the jars have coins weighing one gram, one jar has coins weighing two grams. Using one weighing of an absolute scale (i.e., a scale that will weigh one object placed upon it and will tell the weight of that object as opposed to a scale that weighs two objects and simply identifies which one is heavier, which is normally used for these types of problems), determine which jar has the two-gram coins.

Solutions

F/M 1. We begin with a Bridge problem from Jerry Grossman, who writes: Here's a cute bridge problem that you might want to consider for *TR*. It arose (well, except for one card that I changed to make it more interesting) in a Swiss team game last weekend at the Southeast Michigan Valentine's Sectional.

```
                North
                ♠ 4
                ♥ A J 5
                ♦ A K J 7 2
                ♣ A 8 5 2
  West                        East
  ♠ 9 7 6 5                   ♠ 3
  ♥ 5 3 2                     ♥ K Q 9 8 6
  ♦ 8                         ♦ Q 10 9 4
  ♣ J 10 7 6 3                ♣ K 9 4
                South
                ♠ A K Q J 10 8 2
                ♥ 10 7
                ♦ 6 5 3
                ♣ Q
```

The contract is six spades by South, East having bid hearts (overcalled North's diamond opening bid). How is the contract made against any lead? This is not a double dummy problem, so the play should make bridge sense.

I enjoyed the following solution from Frank Model, especially the ending:

Regardless of opening lead, win the first four tricks with the four aces ending in the South hand. (If a spade was led, get there by ruffing a club.) Now run trumps, pitching dummy's remaining clubs and hearts.

On the last spade, a diamond is pitched from dummy. East must guard diamonds (else dummy's diamonds run, making seven) and so is forced to pitch a heart honor. Now exit with the heart ten. East must win and lead into dummy's diamond tenace. A neat strip squeeze endplay.

Actually, all this makes reasonably good bridge sense. East is odds-on to hold all the key cards (diamond queen, heart king-queen) to justify his overcall. If so, the recommended line cannot fail. But would I have found it in the heat of battle? Almost certainly not.

East could also have overcalled on a club-heart two suiter, in which case a simple diamond finesse, after first cashing the diamond ace and drawing trumps, is a tempting alternative, albeit unsuccessful in this case. For this line, proper technique would entail ruffing some clubs to get a count. The fall of the club king would suggest this line is doomed.

Finally, I need to explain why I am submitting a solution at all, since I do not generally do so for "real life" bridge problems because I do not consider them puzzles. For me, this one has a definite MIT twist. In 1960, while a sophomore, I got involved in my first money bridge game. After staggering into a tenuous six no-trump contract (doubled and vulnerable!), I managed to make by executing—quite inadvertently—a strip squeeze endplay. Needless to say, I was quite pleased with myself (partner was ecstatic...) and looked forward to pulling off this bridge-maneuver-with-the-racy-name many more times as my bridge career progressed, but, during the intervening 33 years, the opportunity has never come up. Until now.

And, with that irrelevant anecdote, I bid you farewell.

F/M 2. Our next problem is Tom Hansen's first submission, a true-to-life story illustrating that "biology students should learn their physics."

A scientist at a Boston-area biotech company needs to centrifuge 5 identical samples. He has available 3 centrifuges with capacities of 6, 8, and 12 samples. Can he use any of these centrifuges to prepare the 5 samples together, without adding another sample or making the centrifuge unbalanced?

The following solution is from Steven Weiss, who writes that this is "my first submission after enjoying your column ever since it began":

Since 5 samples cannot be placed at a uniform distance around any of the centrifuges because 5 fails to divide 6,8, or 12, the solution must involve non-uniform distributions.

Breaking 5 up into 2 + 3, we will try to simultaneously balance each group. We cannot balance the group of 3 samples in the 8-centrifuge, but we can in the 6 or 12 by distributing them uniformly

at intervals of 120 degrees. Similarly we can distribute the group of 2 by placing them on opposite sides of the 6- or 12-centrifuge. The 6-centrifuge cannot hold both groups at once, however, but the 12-centrifuge can! Thus the 12-centrifuge gives us the only solution (as the only other way to break up 5 is 4+1 which patently fails). The balanced configuration looks like this:

Where the CG of the two samples labeled 2 is the center, and the CG of the three samples labeled 3 is the center. Therefore (by knowing some physics) the CG of all 5 is the center.

Bruce Dunwoody notes that any number of identical samples can be loaded into a 12-sample centrifuge except 1, and its complement 11. Dundee also reports that a Vancouver company makes a device that can centrifuge 1 sample; it spins the tube about its own longitudinal axis.

F/M 3. Walter Cluett asks one that sounds very familiar to me. Who knows but maybe it was in "Puzzle Corner" some 20-odd years ago.

Four bugs are standing on the corners of a square surface 1.414 feet on a side. Simultaneously, each starts walking at the same rate directly, and always directly, toward the bug on its right. Eventually they all meet. How far did each bug travel?

There seem to be two techniques. For one, you first show that each bug travels a logarithmic spiral and then do some analysis. The second "short form" solution is typified by the following submission from George Biehl, who writes that he'll "take a shot at the solution and probably prove why I'm now a full-time administrator":

$$A\downarrow \qquad \leftarrow B$$

1. Consider two of the bugs.
2. The velocity vector of bug A is always perpendicular to that of the bug B. (They stay on the vertices of a rotating, shrinking square.)
3. Thus the velocity of the bug A has no component of motion to increase or decrease the distance which B must travel.
4. Bug B must therefore travel 1.414 feet.

Other Responders

Responses have also been received from K. Bernstein, G. Biehl, E. Biek, A. Biolchini, G. Blondin, D. Brahm, F. Carbin, T. DeFazio, S. Feldman, M. Fountain, D. Furman, C. Gabor, M. Garelick, D. Harris, R. Hess, W. Himmelberger, E. Kaplan, R. King, M. Lindenberg, B. Margulies, L. Nasser, A. Ornstein, D. Patter, K. Rosato, E. Sard, E. Sard, and K. Woods.

Proposer's Solution to Speed Problem

Take one coin from the first jar, two from the second, etc., and place them all on the scale. This one total weight determines the jar. If the weight is 65, the jar is number 10; if 64, number 9; etc.