I t has been a year since I specified the size of the backlogs for the various kinds of problems that are printed; let me do so now. I have a multi-year supply of regular problems, two years of speed problems, but chess, bridge, and computer problems are in short supply. This may well mean simply that these speciality problems are of less interest, in which case my exhausting the current supply will lead to three regular problems per issue.

Problems

APR 1. In a high-stakes game of rubber bridge with N-S vulnerable, West leads the spade king against 6NT. Jorgen Harmse wonders what dummy should play to the first trick?

- 8 3 2
- ▲ A K Q 7
- ▼ 7 6 5
- ♠ 5 4 2
- ♥ N
- ♦ S
- ♠ 5 4
- ▼ 6 3
- ♦ A K Q 4
- ▲ A K Q J 6

APR 2. Eugene Sard has a square sheet with side 2, which he has folded so that a vertex falls on the midpoint of an opposite side. How long is the fold line?

APR 3. Albert Mullin writes that real-number constants abound in mathematics, physics, chemistry, and engineering. They provide a “firmament” for computational activities. Here is a new real number constant that you may find amusing. Define \( f_n \) as follows

\[ f_1 = \pi \]

\[ e^{f_2} = \pi^\pi \]

\[ e^{f_3} = \pi^\pi^\pi \]

and so on. Put

\[ F = \lim_{n \to \infty} f_n \]

Surely this limit exists. Further, convergence is super fast. The problem is to compute \( F \) to several decimal places using just a hand-held calculator.

Speedy Department

Speedy Jim Landau wants you to find an English word with three consecutive double letters; now one with five; now one with a triple letter. Why is 6 afraid of 7 and finally why can't you curse the Hudson?

Solutions

N/D 1. Lester Steffens wonders what is the highest score a Bridge pair can obtain on a single hand (excluding illegalities and penalties for reneging, etc.) when neither of them has a card higher than a ten.

Bob Wake was able to obtain the max possible score (setting 7NT vulnerable re-doubled) with no card higher than a nine. Jorgen Harmse notes that these hands are called Yarborouche.

If a total “belpmate” is allowed, West—

with a hand headed by two nines, an eight, and two sevens, and a partner headed by a nine, two eights, and two sevens—can single-handedly take all 13 tricks defending seven notrump redoubled. West could lead the four and seven of hearts, then the six, nine, and three of diamonds, with opponents pitching the club honors and everyone who can follow playing just underneath the card lead:

N/D 2. Nobu Yoshigahara wants you to substitute the digits 1–9 once each in the following equation.

\[ \frac{AB}{CD} + \frac{EF}{GH} = 7 \]

OOPS! Somehow I managed to repeat the same problem in two consecutive issues (OCT and N/D). The solution for OCT 3 given last issue works just fine for this problem as well. The answer is

\[ \frac{95}{247} + \frac{86}{13} = 7 \]

N/D 3. John Rule has a point P situated inside a square ABCD so that PA=1, PB=2, PC=3. He wants you to calculate angle APB "using only the methods of Euclid."

Viewing Pythagoras and Euclid as “colleagues,” I agree with Robert Holt, whose solution follows.

I suppose “methods of Euclid” means avoid analytic geometry. Anyway, in the diagram, EP, AB, FB, BC, G is chosen so that FG, AB - AP = FP, GI = GB, and GI = AD. Then GH = AE + EP, GI = AE - EP, AP^2 = BP^2 - BE^2 = BE^2 - AE^2 = 3. Next, AB^2 = (AE + BE)^2, so BE^2 = AB^2 - AE^2 = 2AE^2 - 2AE BE = AB^2 - 2AE (AE + BE) = AB^2 - 2AE AB. Similarly we obtain S = BC^2 - 2BF BC = AP^2 - 2BF AB. From these two results we have 2 = 2AE AB - 2BF AB, or 1 = AB (AE - BF), or AB AE - 1 = AB BF. Now a \( \Delta ABC = \frac{1}{2} AB GH = \frac{1}{2} AB (AE + EP) \), a \( \Delta APG = \frac{1}{2} AP^2 \), and a \( \Delta ABP = \frac{1}{2} AB EP \). Therefore a \( \Delta BPG = \frac{1}{2} AB (AE + EP) - \frac{1}{2} AP^2 - \frac{1}{2} AB EP = \frac{1}{2} AB AE - \frac{1}{2} AP^2 = \frac{1}{2} (AB AE - 1) = \frac{1}{2} AB BF = a \Delta GPF. Since triangles ABP and GPF have two equal corresponding sides and the same area, the included angles are congruent (or supplementary, but that is impossible by the construction of G). Angles APB and BGF are equal and add to 270 degrees, hence each is 135 degrees. \( \angle APB \) cannot be just 45 degrees as \( \angle P \) is in the half of the square nearer side AB. Angle APB must be less than angle ADB which is 45 degrees.)
89

5th Reunion

The reunion is right around the corner, and I hope people are starting to make plans.

For more info about the reunion, call the new toll-free MIT Alumni/ae Association number: 1-800-MIT-1865. If you haven’t received any reunion mailings by now, it is possible that the Alumni records have a different class affiliation listed (if you graduated in more or less than four years, or if you were in a special program). To fix that, just call the toll-free MIT Alumni/ae number.

Our Class Scholarship fund has awarded another scholarship this year, to John Chiou, ’94. John is a senior in the Biology Department, and plans a career in medicine. John was a TA for “Introduction to Experimental Biology” last spring, and his UROP involved cloning and sequencing of gene fusion in E. Coli for the purpose of implementing improvements to that course. John has assisted with research at the Boston Heart Foundation, and continues to volunteer several hours each week at Children’s Hospital. Please consider designating your gifts to our scholarship fund so that we can continue our support of students like John.

Submissions for the class calendar are still trickling in, so please send those pictures or video tapes (with VHS tape and video player included in Italy) to 1993 Jul 3. Frank Rubin points out that this problem is sometimes called Bonaparte’s theorem, after its discoverer.

Other Responders


Proposer’s Solution To Speed Problem

Bookkeeper; bookkeeper; brasssmith. Because 7 8 9. Because the Hudson is not a dammed river.

news on other classmates that you have kept in touch with. Keep sending that e-mail to singer@mit.edu; for those of you who prefer snail mail, send to: Catherine Suriano Singer, secretary, 131 Main Street #3, Andover, MA 01810.

90

The MIT Alumni/ae Association has informed us of the death of our classmate Sabrina Goodman. Sabrina lost her battle with cancer in early November. The MIT Alumni Association will be sending out an announcement.

In other class news, Ed Hahn was in Boston in mid-November to visit with Chi Phi alums, including John Lee, ’89, Jim Deeds, ’89, Jeff Welch, ’91, Ken Jung, ’91, and Joe Pacatte, ’91. They had a barbecue and proved that you can still have an awesome barbecue in 20 degrees weather. Ed is now working for TWA in aircraft engineering in Kansas City. . . . Ken Woolner is a software developer for Oracle Corp in Redwood Shores, Calif. He’s also pursuing a master’s degree in engineering-economic systems at Stanford. In Ken’s spare time, he runs a baseball league. . . . Charles Li writes from Minneapolis, Minn. Charles is finishing his final year of medical school at the University of Minnesota and waiting to find out the location of his residency program in general surgery. . . . Rachel McCarthy is also finishing up medical school. Rachel is at the University of Florida, training in pediatrics.

Jema Gonzalez is finishing up an MBA at Wharton, majoring in strategic management. Jema spent her past summer working as a management consultant at Deloitte and Touche in northern New Jersey. . . . Maureen Fahey has just received a ScD degree in materials science at MIT. She has since started working at 3M in Austin, Tex. . . . Also in the Austin area is Paul Anderson. In fact, Paul recently had a housewarming party where fellow alums Samir Nonega and Steve Peltzman were spotted. . . . Fankaj Vaihi is now assistant vice-president at Citibank’s Global Finance Department in New York City.

Joaquin LaCalle-Melero, SM ’92, Douglas Fleckner, ’64, Oscar Fleckner, ’63, Mary Eisenberg, ’64, and Dave Tutelman, ’63. Tom and Julie have been planning for two weeks, visiting Rome, Pompeii, Florence, and Venice, and had a wonderful time. Tom and Julie are now living in Ossining, N.Y., where Tom is working at Philips Labs on advanced development of compact fluorescent lamps. Julie commutes to NYC, where she is a Latin teacher at Brooklyn Heights Academy.

Tom and Julie plan on attending the reunion, and Julie is looking forward to the reunion even more than Tom!

Well, that’s it for this month. Thanks again to everyone who wrote in, and I hope everyone is planning their reunions. Please send news and photos! Thanks!—Henry Houh, secretary, 4 Ames St., Cambridge, MA 02142; phone: (617) 223-6680, fax: (617) 253-2673, e-mail: tripleh@mit.edu or hhht@mit.edu or henry_houh@mit.edu