PuzzleCorner

It 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 specialty 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

$$f_1 = \pi$$

$$e^{f_2} = \pi^{\pi}$$

$$e^{e^{f_3}} = \pi^{\pi^{\pi}}$$

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.

SEND PROBLEMS, SOLUTIONS, AND COMMENTS TO: ALLAN GOTTLIEB
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Speed 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 Yarboroughs.

If a total "helpmate" 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:

North
♠ Q J 10
♥ —
♦ A K Q J 10 8 5 2
♣ J 10

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

South
♠ A K
♥ A K Q J 10 9 6 3
♦ —
♣ A K Q

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

$$\frac{AB}{CDE} + \frac{FG}{HI} = 7$$

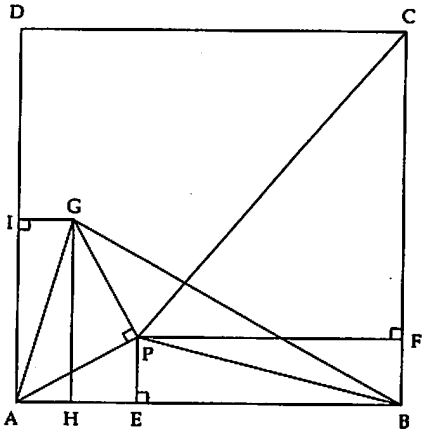
OOPS!! Somehow I managed to repeat the same problem in two consecutive issues (OCT and N/D). The solution for OCT 3 given last issue works just fine for this problem as well. The answer is

$$\frac{95}{247} + \frac{86}{13} = 7$$

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, FP ⊥ BC, G is chosen so that PG ⊥ AP and AP = PG, GH ⊥ AB, and GI ⊥ AD. Then GH = AE + EP, GI = AE - EP, AP^2-AE^2 = BP^2 - BE^2 by the Pythagorean Theorum, and BE^2 -AE^2 =3. Next, $AB^2 = (AE + BE)^2$, so BE^2 = AB^2 - AE^2 - 2AE BE, and 3 = AB^2 - $2AE^2$ - 2AE BE = AB^2 - 2AE (AE + BE) = AB^2 -2AE AB. Similarly we obtain 5 = BC^2 - 2BF BC = AB^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 ΔABC = ½AB GH = ½AB (AE + EP), a ΔAPG = ½AP^2, and a ΔABP = ½AB EP. Therefore a ΔBPG = ½AB (AE + EP) - ½AP^2 - ½AB EP = ½AB AE - ½AP^2 = ½(AB AE - 1) = ½AB BF = a ΔBGP. Since triangles ABP and BGP 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 BPG are equal and add to 270 degrees, hence each is 135 degrees. (Angle APB cannot be just 45 degrees as P is in the half of the square nearer side AB. Angle APB must be less than angle ADB which is 45 degrees.)



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Puzzle

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Better Late Than Never

1990 Apr 2. Frank Rubin has found (with his faster computer) that 39,402,191,713 is prime and if one replaces (all three instances of) 1 with any other digit, the result is still prime.
1993 Jul 3. Frank Rubin points out that this problem is sometimes called Boneparte's theorem, after its discoverer.

Other Responders

Responses have also been received from K. Bernstein, C. Brooks, J. Bross, A. Dehnel, R. Doherty, M. Fountain, F. Furland, J. Hahn, W. Hartford, R. Hess, R. Holt, A. Katzenstein, J. Keilin, S. Levitin, M. Lindenberg, N. Markovitz, J. Miller D. Moyer, T. Pappas, W. Peak, K. Rosato, F. Rubin, R. Sackheim, E. Sard, H. Sard, I. Shalom, S. Shalom, R. Sinclair, N. Tsang, N. Wickstrand, and K. Woods.

Proposer's Solution To Speed Problem

Bookkeeper; boob-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.

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 co-op program). To fix that, just call the toll-free MIT AA 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 (either VHS or 8 mm). All submissions will be returned. We'll be publishing the school-year calendar, which will feature pictures of classmates, families, and other alumni/ae events, shortly after the reunion.

Here are this month's list of people to please write in: Zsuzsanna Gaspar, Frederick Kloer, Cheryl McCullum Smith, Nat Seshan, and Feei Wang. What are y'all up to? If anyone knows about any of these people or anyone else, please write in!

Jon Lyszczarz graduated from the Uniformed Services University of the Health Sciences, was promoted to lieutenant, and is now serving as a physician in the Navy.

David Campbell, Jr. finished his second deployment to the Mediterranean with the Navy Seals, and is planning on leaving the Navy, hiking the Appalachian Trail, bicycling across the country, and finding a job in the alternative energy field.

Eric Reifschneider became a member of the Illinois bar in November '92, and completed his first year as a corporate lawyer with Katten Muchin & Zauis, Chicago's fourth largest law firm. Eric is a member of the firm's technology group, and has been reviewing and drafting software license, consulting, and confidentiality and noncompletion agreements. Eric has assisted clients in venture capital transactions and has also worked on several White Sox player contracts.

Barry Margulies writes that he is "still slaving away in grad school, still at Hopkins, seeing other alums come and go (mostly come, though)." Also in Barry's program are Larry Buxbaum, '87, and Pierre Chevray, '87, both MD/PhD candidates who are the same year as Barry in the PhD program. Newer arrivals include Eleanor Hoff, '91, and Teresa Zimmers, '90, who just started after a few years at NIH. Barry still shares a bench with Mary-Elizabeth Harmon, '90, in Wade Gibson's lab, experimenting on human cytomegalovirus (human herpes virus 5).

"Things have been going better, research-wise, over the last few months; Lady Science has actually been smiling on me. I hope this luck will last all the way to graduation..." Barry writes. Barry has also started giving back to the 'Tute: giving his first interviews for undergrad applicants this year. Barry was excited that one of his interviewees was accepted early. "Oh, what a feeling to be a part of someone's future like that!"

Barry also writes that Alice Lin is in her second year in a PhD program at Tufts School of Medicine downtown. She just passed orals, and "is a model scientist (as always)." Miky Ishida is now living in Seattle, temping until she can get a job in an architecture firm in the area. Miky recently moved from LA because of the better job market in Seattle. Christopher Wolfe, '87, and Ellen (Lin) Wolfe, '88, moved back to Schenectady so that they could stay employed with GE. They had their first son, Nicholas, in September.

Tom Farkas writes about his August 15th wedding to Julie Primost (Tufts '91). Among those attending the wedding held in Red Bank, N.J., were Alex Rosen, who was the best man; groomsmen Ira Scharf, Brian Luschwitz, and Arnold Zipper; Joe Lichy, Dean Ebesu, John Ofori-Tenkorang, David Perreault, SM '91, Joaquin LaCalle-Melero, SM '92, Douglas Fleckner, '64, Oscar Fleckner, '63, Mary Eisenberg, '64, and Dave Tutelman, '63.

Tom and Julie honeymooned in Italy 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 Poly Prep School. 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 those reunion trips! Please send news and photos! Thanks!—Henry Houh, secretary, 4 Ames St., Cambridge, MA 02142; phone: (617) 225-6680, fax: (617) 253-2673, e-mail: tripleh@mit.edu or hhh@mit.edu or henry_houh@mit.edu

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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. She died peacefully among her family and friends at her home in California. At the time of her death, Sabrina was a student on medical leave from the University of Rochester, where she had been pursuing a PhD in psychology. At MIT, Sabrina received dual bachelor degrees in cognitive science and mathematics. She was a resident of the Fenway House, a member of Alpha Phi Omega, and active in the Tech Random Music Ensemble and the Experimental Study Group (ESG). A memorial service was held in early December in Huntington Beach, Calif.

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 degree 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.

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. . . . Pankaj Vaish is now assistant vice-president at Citibank's Global Finance Department in New York City.