Almost. My attempt to achieve seven decades without a hospital admission fell a little short when my prostate was removed in February. Thanks to my excellent internist and surgeon, my case was diagnosed very early and I am considered "cured." Now, two months later, I feel very good and am nearly side-effect-free.

In an attempt to turn lemons into lemonade, I used the time at home to improve my Italian. As a result, our recent trip to Rome—always a pleasure thanks to the history, the architecture, the food, and the coffee—was even more enjoyable than normal.

Problems

J/A 1. Jorgen Harmse wants South to make seven spades when West leads the king of hearts.

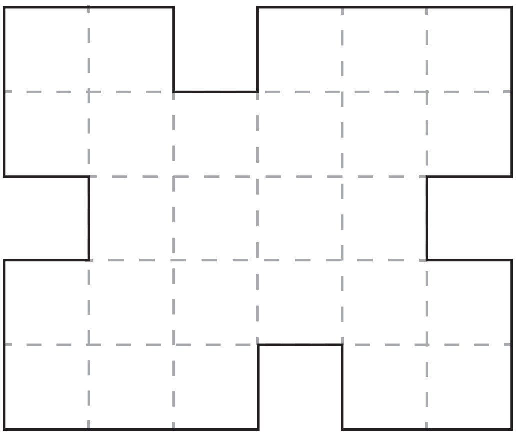
North:
♠ A
♥ J 10 8 7
♦ A K Q
♣ A 10 9 4 2

West:
♠
♥ A K Q 9 3 2
♦ 7 5
♣ J 7 6 5 3

East:
♠ J 9 7 6
♥ 6 5 4
♦ J 8 4 3
♣ K 8

South:
♠ K Q 10 8 5 4 3 2
♥
♦ 10 9 6 2
♣ Q

J/A 2. Our next problem, from "Golomb's Gambits" by Solomon Golomb, is one of a series entitled "Figures Drawn and Quartered." You are to dissect the following geometric shape into four congruent pieces.



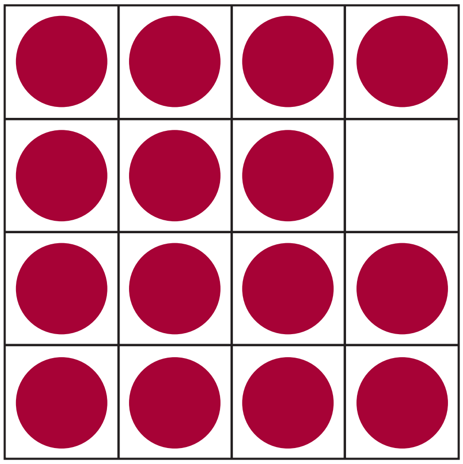
J/A 3. Ermanno Signorelli asks us to suppose that he works at a firm with 4,000 employees and that HR has decided to drug-test 1,000 employees every three months. To be "fair," HR will select the 1,000 subjects randomly each time, regardless of whether they have been tested before. What is the probability that at least one employee will not be tested after 10 years? What is the probability that Ermanno himself will not be tested? Assume that no employees either join or leave the company.

Speed Department

David Hoffman found a relation between two of his favorite numbers, a googol (10^{100}) and π. Specifically, David asks you to first combine 100, 193, and $\log_{10}(11222.11122)$ to closely approximate $\log_{10}(\pi)$. Then you are to eliminate the logs.

Solutions

M/A 1. Rocco Giovanniello loves his winks! This time we have a four-by-four grid with all but one position initially filled as shown below. Each move consists of having one wink jump over another (vertically or horizontally) adjacent wink, removing the latter. The goal is to find a series of moves ending with just one wink on the board.



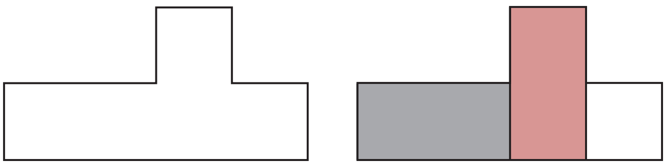
John Chandler sent us one of his *many* solutions, as well as letting us know which initial positions are unsolvable. He writes:

By my calculation, there are 210,422 solutions in all. Here's one. Each line gives the starting and ending position of the wink that jumps, with the row and column of each.

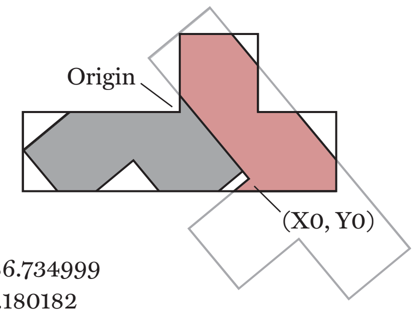
1. (4,4) → (2,4)
2. (1,4) → (3,4)
3. (1,2) → (1,4)
4. (3,2) → (1,2)
5. (1,1) → (1,3)
6. (3,1) → (1,1)
7. (1,4) → (1,2)
8. (4,2) → (4,4)
9. (4,4) → (2,4)
10. (2,4) → (2,2)
11. (1,2) → (3,2)
12. (3,3) → (3,1)
13. (4,1) → (2,1)
14. (1,1) → (3,1)

Note that move 7 in this solution can be pushed back to 8, 9, or 10, thus giving a family of four different, but related, solutions. By symmetry, a corresponding set of 210,422 solutions exists for any starting position with all squares occupied except one of the middle two squares of an edge. By contrast, there are no solutions for a starting position with all squares filled except one of the corners or one of the central four.

M/A 2. Richard Hess, Robert Wainwright, and Yoshiyuki Kotani note that the pentomino on the left can easily be 80 percent covered with two congruent tiles as shown on the right. They want you to find another tile such that two of them can cover more than 86 percent of the pentomino. The tiles may not overlap each other or the pentomino border. One of the tiles may be turned over to achieve the covering.



Although this problem seemed very difficult to me, I received a number of lovely solutions. You can find Carl Wittenberg's response on the Puzzle Corner website (cs.nyu.edu/~gottlieb/tr); Edward Sheldon's solution follows.



AreaPeak= 86.734999
ThetaD= 50.180182
X0= .904969
Y0= -.847906

M/A 3. Howard Stern is concerned that someone is in his seat.

An airplane with 100 seats is full. Every passenger is assigned a seat. However, the first passenger to board the plane ignores his boarding pass and chooses a seat at random. The second and all subsequent passengers sit in their assigned seat if it is unoccupied when they board. If their seat is occupied, they choose an empty seat at random. I board the plane last and sit in the one remaining seat. What are the odds that I am sitting in my assigned seat?

Donald Aucamp, in the finest MIT tradition, turned this problem into a game. In an addendum Aucamp generalized the game and found the probability that the nth passenger gets his or her assigned seat for a full plane with n seats. Aucamp's solution to the original problem follows.

With no loss in generality it is helpful to tag the passengers 1–100 in their order of entry, and to also tag their assigned seats 1–100. It is instructive to consider the following example: Suppose the first passenger randomly selects seat 8. Then passengers 2–7 get their assigned seats because they are empty, and 8 is the next to randomly select. Suppose he chooses 19. Then 9–18 get their assigned seats, and 19 is the next to randomly select. This continues until a passenger P either selects seat 1 (in which case the "game" is over, and all the remaining passengers, including 100, get their assigned seats) or selects 100 (in which case the game is over and 100 does not get his seat). Note that these two game-ending probabilities are equally likely—specifically, if passenger N is selecting, the probability is $1/(100 - n + 1)$. Thus, every time a passenger selects at random, he has an equal chance of guaranteeing that 100 gets his reserved seat or guaranteeing that 100 does not get his reserved seat. If the game doesn't end until passenger 99 must choose at random (his seat is taken), then seats 1 and 100 are empty, and once again, it is equally likely that 100 gets his assigned seat or loses it. Accordingly, the overall probability that passenger 100 gets his assigned seat is 1/2.

Better Late Than Never

2014 N/D 2. Bert Krauss points out that the solution is worded as though each logician sees only those logicians "in front" of him/her, whereas the problem states that logicians see every other logician. The argument in the published solution is still valid.

Other Responders

Responses have also been received from M. Azizoglu, B. Byard, B. Coltrin, G. Cunningham, G. Fischer, J. Hardis, V. Henzi, A. Iqbal, D. Katz, P. Kramer, N. Lang, Z. Lu, F. Mamrol, B. McQuain, Z. Mester, T. Mita, B. Nalebuff, T. Oktay, A. Ornstein, P. Paternoster, P. Rauch, B. Rhodes, K. Rosato, P. Schottler, M. Shatz, P. Sheu, A. Shuchat, T. Sim, J. Simmonds, G. Slick, M. Strauss, K. Wise, and B. Wright.

Proposer's Solution to Speed Problem

$\log_{10}(\pi) \approx (100 - \log_{10}(11222.\ 11122))/193$

$\pi \approx (\text{googol}/11222.\ 11122)^{1/193}$

both accurate to 10 figures.

Send problems, solutions, and comments to Allan Gottlieb, New York University, 715 Broadway, Room 712, New York, NY 10003, or to gottlieb@nyu.edu. For other solutions and back issues, visit the Puzzle Corner website at cs.nyu.edu/~gottlieb/tr.