

I U P U I
MATH CLUB TEASER #16

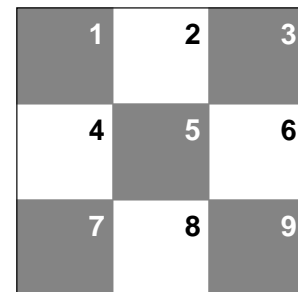
March 13, 2009
(due March 27, 2009)

SOLUTION

The least number of moves required is 6. There are four paths that solve the problem (recall the die starts at 5):

5-2-3-6-5-8-7	5-4-1-2-5-4-7
5-6-3-2-5-4-7	5-8-9-6-5-8-7

To verify that 6 moves is the minimum, start by coloring the grid in a checkerboard fashion. Since each flip moves the die to a square of the opposite color, an even number of flips is needed to go from square 5 to square 7. This means that the solution must be two, four, or six steps long.



There are two routes from 5 to 7 in two moves, and neither of these will put the six-face of the die on top. Also, a route of length four that does not backtrack must go around a corner and return to square 5, so a solution in four moves is impossible too. This means that six moves is the minimum as claimed.

SOLVED BY:

The Dream Team, Tat Lee, Zoila Malespin, The Residues,
Jeremy Wuestefeld, X.