

Nutcracker Physics Problem set 3

Maths In a $(2n - 1) \times (2n - 1)$ square grid, every small square, has an arrow marked in it, up or down or right or left. A bug is in an arbitrary small square. In each move, It moves to an adjacent square following the arrow. After the bug leaves a square, the arrow marked in that square rotates anticlockwise by $\frac{\pi}{2}$.

Show that the bug will be out of the big square in atmost $2^{3n-1} \cdot (n - 1)! - 3$ moves.

Solutions should be mailed to bharathm@iitk.ac.in. If you have written it by hand, get it scanned. (scanning can be done in CC or hall 1 xerox shop) Don't forget to write your hall name and pool name along with your name.