

April 2024 Problem of the Month

Suppose we start a journey at the origin. We travel 1 foot east, 3 feet north, 5 feet west, 7 feet south, 9 feet east, 11 feet north, always turning 90 degrees to the left and travelling 2 feet further than last time in a spiral pattern as illustrated. Also, suppose we travel at 1 foot per second and that we started at the first moment of 2024. Remember that 2024 is a leap year.

- What will our (x, y) coordinates be after 2024 seconds?
- What will our (x, y) coordinates be after exactly 1 year?
- How many of the possible 4049^2 coordinates (x, y) will we eventually get to where $-2024 \leq x \leq 2024$ and $-2024 \leq y \leq 2024$ and x and y are both integers?

Please email solutions to Dr London at slondon@luc.edu in PDF form by 11:59 pm on April 30. The solution with the best explanation from a Loyola undergraduate will be the winner.

