

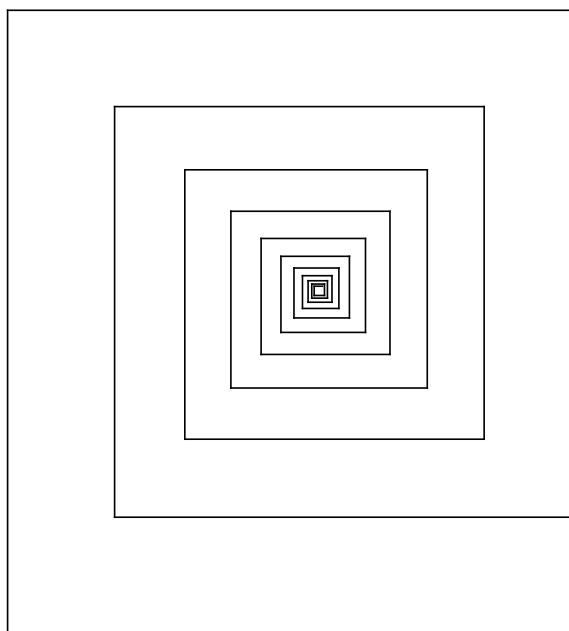
April 2025 Problem of the Month

Return of the Spiral

a) We start at $(0,0)$ and walk 400 feet north and turn 90 degrees to the right. We then walk 75% of 400 or 300 feet east and turn 90 degrees to the right. We next walk 75% of 300 or 225 feet south and turn 90 degrees to the right. We repeat the process indefinitely of walking 90% of the distance that we last walked and turning 90 degrees to the right forming a spiral. What are the exact coordinates we approach after repeating the process indefinitely?

b) We start at $(0,0)$ and walk x feet north and turn 90 degrees to the right. We then walk $x * y$ feet to the east and turn 90 degrees to the right. We next walk $x * y^2$ feet south and turn 90 degrees to the right. We repeat the process indefinitely of walking y times the distance that we last walked and turning 90 degrees to the right forming a spiral. Assume $x > 0$ and $0 < y < 1$. If the point we eventually approach is $(60, 50)$ find the ordered pair (x, y) .

Please email solutions to Dr London at slondon@luc.edu in PDF form by 11:59 pm on April 30. Please clearly state your name, whether you are an undergraduate, and your major on your solution. The best solution wins.



Preparing people to lead extraordinary lives