

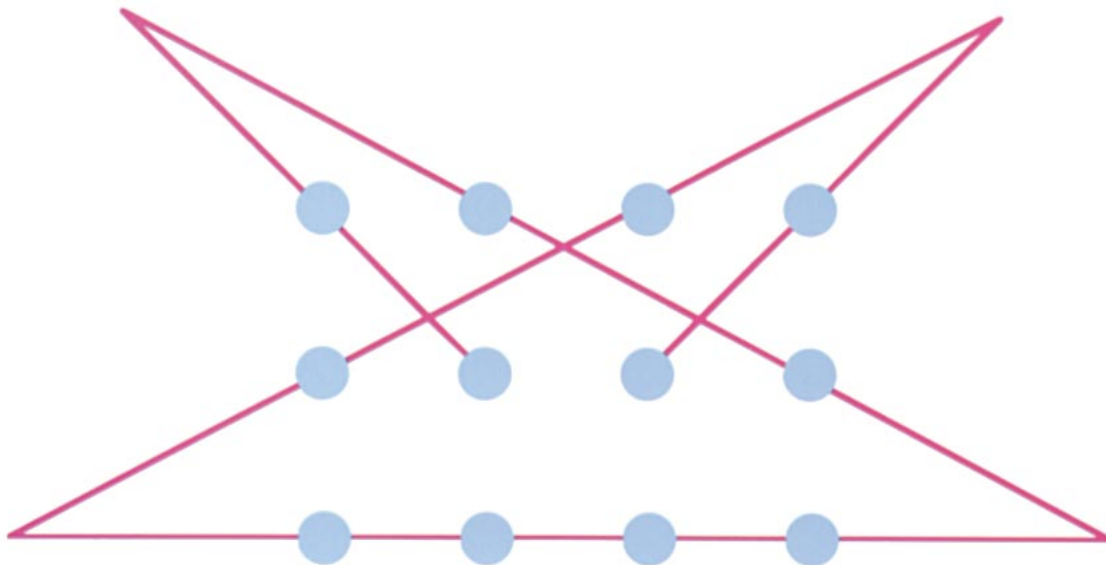
The Twelve Dots

Problem-of-the-Week

The Problem

Twelve dots are arranged in a rectangle so that the dots are an equal distance apart. A broken line, consisting of five line segments, must pass through all twelve dots. The broken line must start at one dot and end at a different dot. Each line segment must go through at least two of the dots.

One solution to this problem is given. Find all the other solutions. Do not count two solutions as different if they can be made to coincide through rotation or reflection.



Strategies and Hints

1. The solutions must be open broken lines. Complete the figure above to show a closed broken line that goes through all the dots. Use this to find two more solutions.
2. There are seven solutions in which the lines do not go outside the edge of the rectangle formed by the dots. Find these solutions.
3. A simpler version of this problem uses just the 9 dots on the left. They must be connected with a broken line of four segments. Solve the 9-dot problem. How many solutions are there to the 9-dot problem?