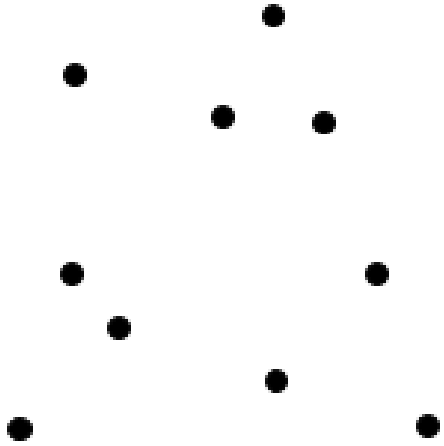
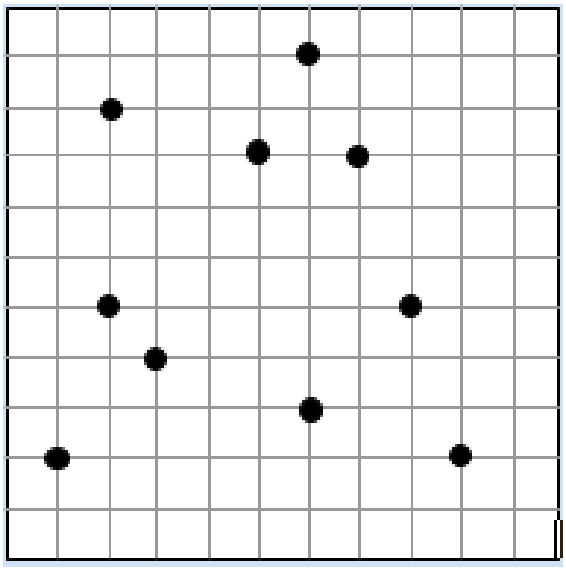
Worksheet: Shortest path (part 1)

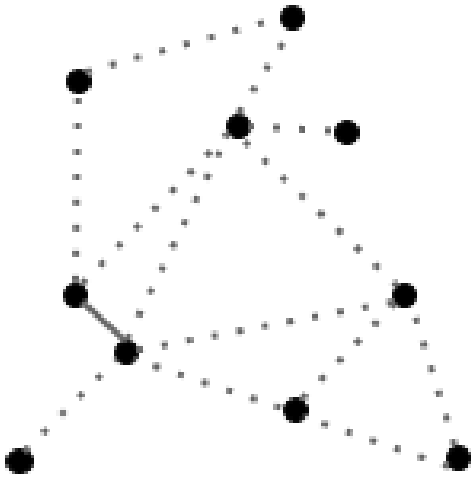
1. In the drawing below are a set of points.
Using a ruler and a pencil, try to draw the shortest route you can that connects all of the points.
As you draw each line, keep track of the length of each line so you know how long your route is.



2. Try to find the shortest path using the grid below. The dots are in the same place but instead of drawing diagonal lines between two points, your route can only follow the grid lines. Keep track of the distance traveled as you draw your path.



3. Try to find the shortest path using the network below. The dots are in the same place as before but the only paths between them are the lines.
   Keep track of the distance traveled as you draw your path.



4. What was your total distance for each path?
   Rank the difficulty of developing a path for each one where 1 is the easiest and 3 is the most difficult.

Type	Total Distance Traveled	Difficulty (1 = easy, 3 = hard)
Dots		
Grid		
Network		

Is there a pattern or equation that enables you to predict the number of lines that could directly connect all of the points in a set? It may help to start with the diagrams below and determine how many lines could all the points in each set.