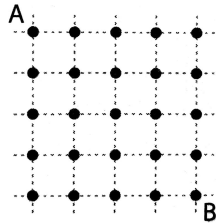


Problem set 2, assigned on 9/25/22

1. Connect points A and B with a path made of four segments (which are not necessarily horizontal or vertical), so that:
- all four segments have the same length,
 - neighboring segments are not collinear (are not on the same line),
 - each segment starts and ends at a marked point but does not pass through any other marked points.



2. A grasshopper jumps along the road, right or left. He jumps 1 inch, then he jumps 2 inches, and so forth; his last jump was 10 inches long. Could the grasshopper, after making these 10 jumps, land exactly where he started?
3. Karin is pretty sure that if the area of one rectangle is smaller than the area of another one, and if the perimeter of the first one is smaller than the perimeter of the second one, then the first one would definitely fit into the second one. Is she right?
4. There are 10 red, 8 blue, 8 green, and 4 yellow pencils in a box. (a) What is the biggest number of pencils you could take, without looking, so that you leave at least 6 blue pencils? (b) What is the biggest number of pencils you could take, without looking, so that you leave at least 1 pencil of each color?
5. A policeman lives in the corner house of a town. (See the town map below.) Every night he has to patrol the streets of his hometown. The policeman wants to plan his patrol route so that he walks every street (maybe more than once) and returns home. What is the length of the shortest possible route?

