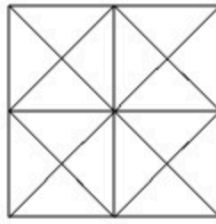
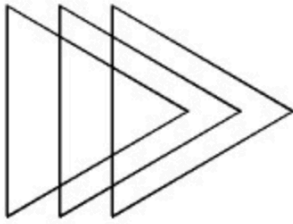


Which of the following pictures can be drawn in one stroke of pen, without traversing a line twice (like a Euler path in a graph)?



Ans: The first one. We can convert this problem into another form, which graph has Euler path. (Euler path: path in the graph which visits each edge exactly once. If there exists a Euler path, then the graph has at most two odd vertices. For the graph one, the degree for each vertex are 2. For the second one, there are more than 2 vertices whose degree equals to 3.

However, even the graph has no odd vertices, this does not guarantee existence of a Euler cycle. In order to better prove, I draw the graph in certain sequence. Please see the picture attached to the documents. (1 is starting point and 14 are the one before the last one. Finally, the last vertex is 1.) Hence, there exists a Euler cycle in first graph. (Euler cycle: Euler path which starts and ends at the same vertex)

