MAU22C00 Assignment 6, Due Friday 10 November 2023

1. Consider a line in the plane with two points marked on it. We'll say that a point is constructible if there is some Eulidean geometry construction which allows you to find that point, starting from that line and those points. Show that there are points on the line which are not constructible. *Note:* You don't need much knowledge of Euclidean geometry for this problem. You can use the fact that points on a line can be parameterised by real numbers.

2. Consider the following undirected graph.
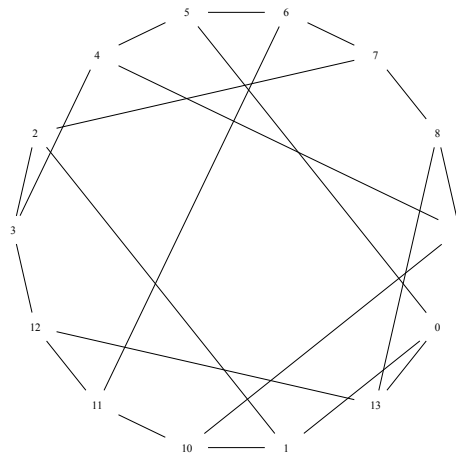
   Is it

   (a) bipartite?
   (b) complete?
   (c) connected?
   (d) directed?
   (e) regular?

   Hint: The numbering of the vertices is not random.

3. Does the graph in the preceding problem have

   (a) A Hamiltonian path?
   (b) An Eulerian trail?