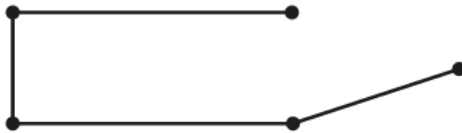


Exercise 2C

- 1 **a** and **b** are trees.
c is not a tree, as it is not a connected graph.
d is not a tree, it contains a cycle.

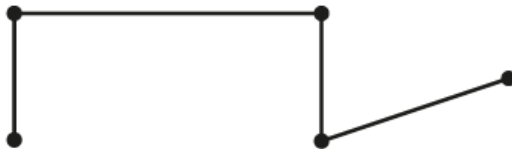
2 **i**



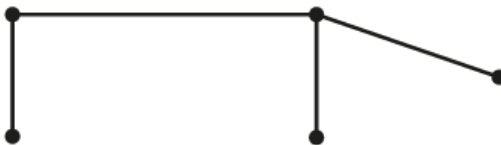
ii



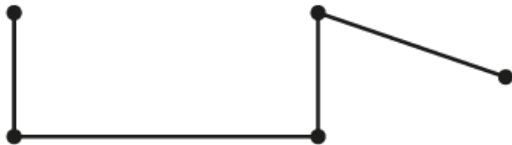
iii



iv



v



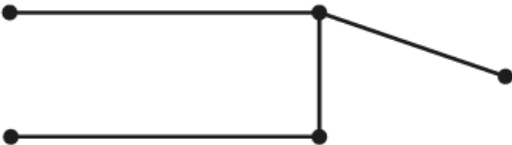
vi



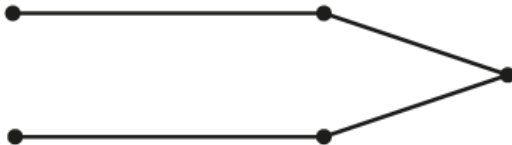
vii



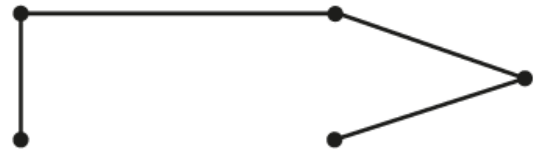
viii



ix



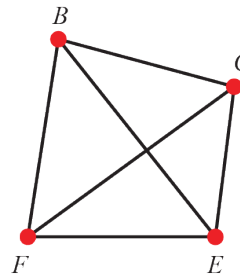
2 **x**



xi



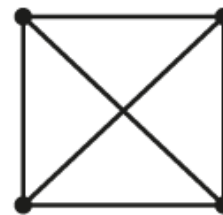
3



- 4 **A**, **C** are isomorphic to the graph **D**.
B cannot be isomorphic to **D** as it has a vertex of degree 3 and the graph **D** does not.

- 5 **a i** Tree is a connected graph with no cycles.
ii Spanning tree is a subgraph which includes all vertices and has no cycles (so is therefore also a tree).
b The graph is not connected so it does not have a connected subgraph either.

6 **a**



- b** Each vertex in K_n is connected to all the other vertices so it has degree $n - 1$.
c Each vertex is connected to 19 others so the total number of edges is $\frac{20 \times 19}{2} = 190$ (we divide by 2 to avoid double counting).

Challenge

