

Problem 1: Please sort all trees on 8 vertices into homeomorphism classes.

The trees with 8 vertices are given as

	1	2	3	4	5	6	7	8
1								
2								
3								

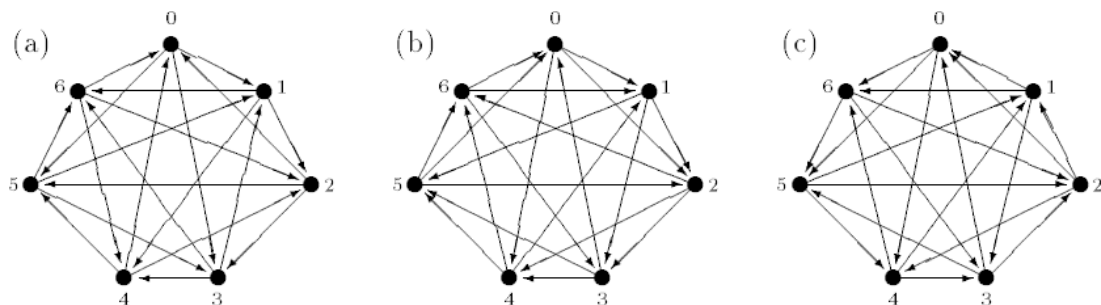
and each homeomorphism class is given in the table below along with the index of each corresponding tree.

Homeomorphism Class	Tree Indices	Homeomorphism Class	Tree Indices
	(1,1)		(1,2), (1,3), (1,4), (1,5)
	(1,6), (1,7), (1,8)		(2,1), (2,2)
	(2,3)		(2,4)
	(2,5), (2,6), (2,7), (2,8), (3,1), (3,2)		(2,7), (2,8), (3,1) start here
	(3,2)		(3,2)

Problem 2: Show that the graph G (defined later) is not planar in two ways: (1) Use Kuratowski's Theorem, and (2) use the Euler identity $n - e + f = 2$. **Notation:** For $n \in \mathbb{N}$, $[n] = \{1, 2, 3, \dots, n\}$, and $[0] = \emptyset$. Define $G = (V, E)$ as follows. Let $V = \{2\text{-sets of } [5]\}$, with vertices x and y adjacent if and only if $x \cap y = \emptyset$.

insert text her

Problem 3: Please prove that no pair of the directed graphs in the figure below are isomorphic.



insert solution here