Name: _Key_

Unless told otherwise, show your work. Answers without work earn reduced credit.
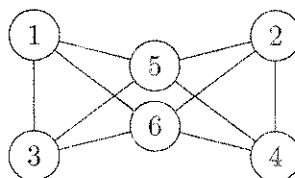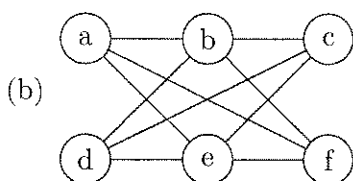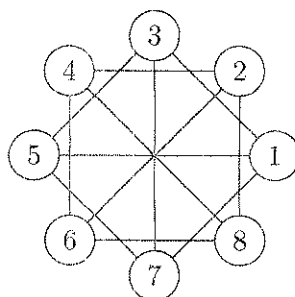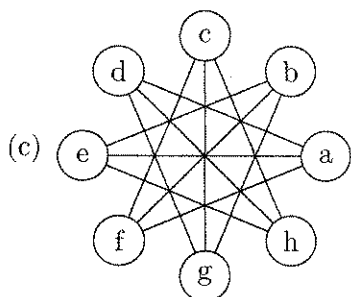
1. [**3 parts, 1 point each**] Decide whether the following pairs of graphs are isomorphic. If they are isomorphic, give the function that establishes the isomorphism. If not, explain why.
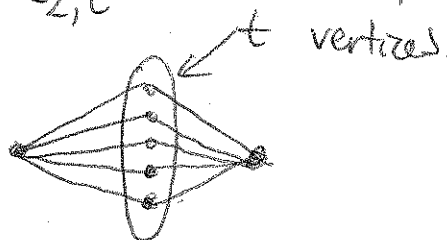
(a)
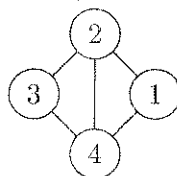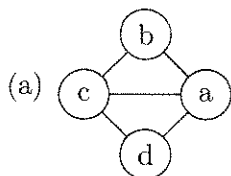
Isomorphic: $f = \begin{pmatrix} a & b & c & d \\ 2 & 3 & 4 & 1 \end{pmatrix}$

(b)

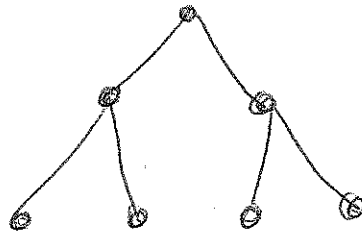Isomorphic: $f = \begin{pmatrix} a & b & c & d & e & f \\ 2 & 5 & 1 & 3 & 6 & 4 \end{pmatrix}$

(c)

Not Isomorphic. The left graph is _connected_, the right graph is _not connected_.

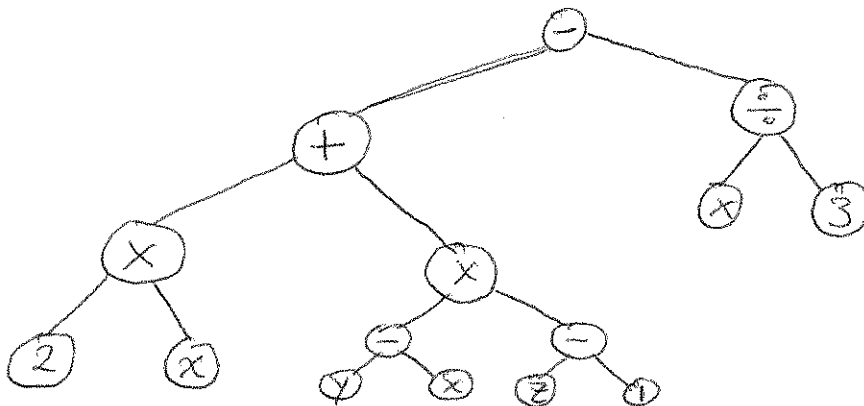2. [**2 points**] Prove that if t is a positive integer, then $K_{2,t}$ is a planar graph.

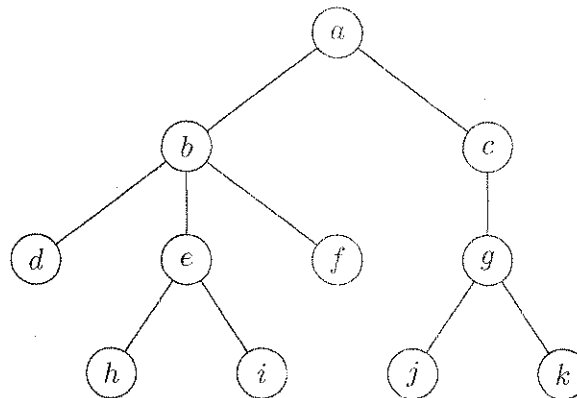We can draw $K_{2,t}$ in the plane:

t vertices.

3. [**1 point**] Sketch a full binary tree of depth 2.

4. [**2 points**] Draw the expression tree for $[(2 \times x) + ((y - x) \times (z - 1))] - (x \div 3)$.

5. [**2 points**] Write the list of nodes resulting from a preorder traversal, an inorder transversal, and a postorder transversal of the following ordered tree.

Preorder: a b d e h i f c g j k

inorder: d b h e i f a j g k c

Postorder: d h i e f b j k g c a