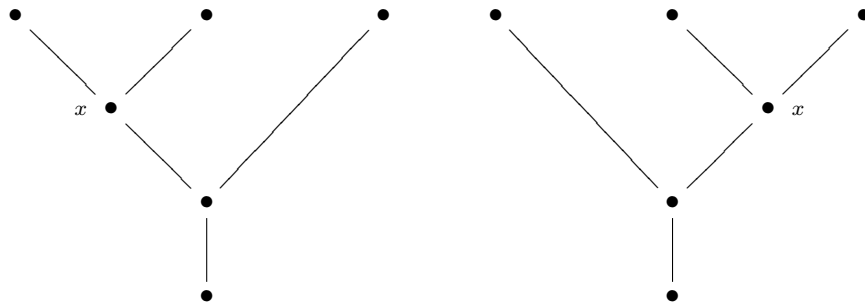


MATH 481
EXTRA CREDIT PROBLEMS

Binary trees. Draw the following convex polyhedron: the vertices are labeled by rooted binary trees with five leaves. Draw an edge between two vertices if you can get from one tree to another by moving only one branch. For example, we can move the vertex x below to turn one tree into the other:



Hint: the polyhedron has 14 vertices and 21 edges.

Permutations. Draw the following convex polyhedron: the vertices are labeled by permutations of four objects. Draw an edge between two vertices if you can get from one permutation to another by one of the three basic swaps: (12) , (23) , or (34) .

Hint: the polyhedron has 24 vertices and 36 edges.