Summer Camp of 57 School

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1 Combinatorics of trees

Problem 1. Reconstruct the tree with the sequence of transpositions: (13)(34)(24)(46)(56)(67)(68). How many leaves does it have?
Problem 2. Draw all the non-isomorphic trees on 6 vertices.
Problem 3. Find all the symmetries of the graphs you have drawn and check up the Cayley formula for them.
Problem 4. Draw the graph with one cycle and at least 8 vertices. For an arbitrary numbering of vertices and edges find the corresponding permutation.
Problem 5. Draw the tree with the code a) $x_1^2x_2^3x_1x_4$;
b) $x_2^3x_3x_1^2$.
Problem 6. How many trees with n numbered vertices and $n-1$ numbered edges are there?
Problem 7. How many trees with $n-1$ numbered edges are there?