

Introduction to Mathematical Modelling

Question List 3.

Elements of the graph theory and combinatorics

1. What is the definition of a graph? A complete graph? A bipartite graph?
2. What is a permutation? How many permutations of n -elements set exist?
3. What is the number of m -element subsets of an n -element set?
4. How many edges has the complete graph K_n ? The complete bipartite graph $K_{n,m}$?
5. Planar graphs. The Euler formula for planar graphs.
6. Kuratowski's theorem for planar graphs.
7. The Eulerian paths and the Eulerian circuits. The Eulerian graphs: necessary and sufficient condition.
8. Connected graphs and bridges. The Fleury algorithm.
9. The Hierholtzer algorithm.
10. The Hamiltonian graphs: definition, example.
11. The Dirac theorem. The Ore theorem.