

Introduction to Mathematical Modelling

Question List 3.

Euler's polyhedral formula. Platonic and Archimedean solids. Planar tilings. Lattice polygons and Pick's theorem.

1. What is the definition of a Platonic solid? How many Platonic solids exist? Name them.
2. Name all the Platonic solids and indicate which type of faces/ vertices each of them have.
3. What is the definition of an Archimedean solid? How many Archimedean solids exist? Give you favorite example of an Archimedean solid, indicate types of its faces/vertices.
4. The Euler formula for polyhedrons.
5. What are the definitions of tessellation, polygonal tessellation? Give examples
6. Define regular and semi-regular polygonal tessellations, give examples.
7. Draw tessellations with the following vertice types: 4-8-8, 3-6-3-6.
8. How many regular polygonal tessellations exist? Draw each of them and indicate its vertice type.
9. The Pick formula for lattice polygons: formulation, examples.
10. Draw two examples of lattice polygons which DO NOT follow the Pick formula. Explain.