

Foundations of Mathematics 12

Conics and Tessellations

Introduction:

Conic sections and tessellations are all around us. They can be found in nature, architecture, fine art, and everyday life. Naturally occurring and man-made objects exhibit fascinating mathematical ideas.

Resources Needed:

Internet access
Online fractal/tessellation generator

Key Terms:

Conic section, cone, circle, ellipse, parabola, hyperbola, fractal, tessellation

Activities:

- 1) Understand what a conic section is and what each of them can be used for. Research the 4 types of conic sections. Be able to come up with their equations and how to draw them.
- 2) Find out how each of the 4 types of conic sections are used. Find a picture of an object where the conic section is found and explain why this particular conic section is useful in the object.
- 3) Describe what a fractal and a tessellation is.
- 4) Pick a piece of artwork by Escher, Koch, Cantor, Sierpinski etc. and explain how it is made through the use of fractals or tessellations.
- 5) Create your own fractal or tessellation by hand or online using an online generator to demonstrate your understanding of the properties of geometric transformations.

Evaluation:

Create a presentation to demonstrate your knowledge. Options include an interview, PowerPoint presentation, poster, video, brochure, ... etc. It is up to you how the evaluation will take place and be warned some methods take more time than others.