The Art of Fractals

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Synopsis

Fractals are a topic of recent mathematical research and study. It is a beautiful way of connecting math to art. I am planning to cover this unit in my International Baccalaureate second year class, IB Math Methods 2 (SL). I have 11th and 12th graders in this class. The syllabus of math methods has a variety of topics and so it gives flexibility to include a topic like this. I am intending to cover this topic after I cover the algebra portion of the syllabus. In algebra, we learn about arithmetic and geometric sequences and series and we also cover basic algebraic topics like logarithms and iteration as well as basic geometrical concepts like similarity. All these concepts come in handy in working with fractals. As part of our IB curriculum, we are required to spend some time on portfolio work. Portfolios are based on real life questions from the topics that we cover in our syllabus. We spend some class time on portfolios and then we also assign some for homework so students can demonstrate their individual understanding. Fractals are part of my class portfolios. Many objects found in nature are fractal-like and once we understand what a fractal is, we can begin to see and appreciate it. A fractal which by definition includes self similarity, can often be viewed as a work of art. In most cases, we start with a basic shape like a line or a triangle or a square and perform a mathematical process to it and then repeat that process infinitely. This can give rise to beautiful work of art and the mathematics involved includes calculating the perimeter and the area and realizing that even though the perimeter of the figure goes to infinity as a result of iterating a process, its area remains finite.