

Linear Algebra-Fractals

Fractals are a relatively new subject in the field of mathematics, but their presence is felt all over the world. Fractals can be described as “A geometric pattern that is repeated at ever smaller scales to produce irregular shapes and surfaces that cannot be represented by classical geometry”(2 Fractals). Fractals appear throughout nature, whether it be in the coastline of an island, the shape of a snowflake, even the way a mountain erodes! Although there are many different ways to create and display fractals, linear algebra is at the forefront.

To create fractals using linear algebra, the rotation matrix and scale factors are at the forefront. Because fractals are created by ever smaller scales of the original design, all that is needed is to rotate the original and scale it smaller. This process repeated over and over creates an intricate fractal design, one that can be used to portray and explain various mathematical properties. As computers began to become more common, many mathematicians were able to create programs to study these forms. As seen in the attached maple worksheets, computers allow the easy creation and understanding of fractals.

Fractals are a fascinating subject in the field of linear algebra. Although they can be hard to reproduce, they hold very valuable information about the earth and how it works. Even in a problem such how long is the coastline of an island, the use of fractals

shows that they are infinite in length. Fractals allow mathematicians to study subjects with much greater detail, and to expand our knowledge of the world we live in.

Works Cited

1.Chavez, Patrick, and Darren Tully. *Fractal Generated Music*. School, 19 Dec. 1997. Web. 18 Apr. 2012.

2."Fractals." *Free Dictionary*. Houghton Mifflin Company, 2005. Web. 20 Apr. 2012. <<http://www.thefreedictionary.com/fractal>>.

3.Piekniowski, Philip. "Clean Environment." *Fractals in Maple*. N.p., n.d. Web. 18 Apr. 2012. <http://www-users.mat.uni.torun.pl/~philip/Maple_fractals/>.