1 A Famous Fractal: The Koch Snowflake

The *Koch snowflake*, Helge von Koch [1]. infinite number of times:

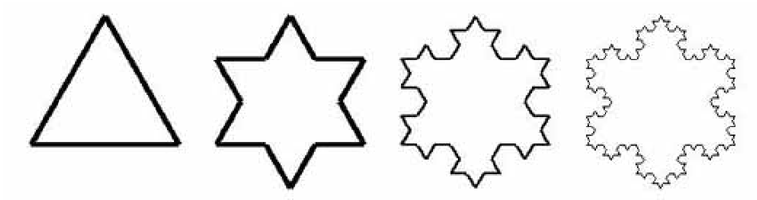

Figure 1: The Koch snowflake

First, divide.

Figure 1.

Theorem 1. *infinite length.*

Proof. Δ N_i L_i Then,

$$= \begin{cases} 3, & \text{if } n = 0 \end{cases}$$

This

$$. \tag{1}$$

while

$$L_n = \frac{L_{n-1}}{3} = . \tag{2}$$

From Eqs. 1

$$N_n L_n = () \, .$$

it follows $\to \infty$, which. □

The Koch snowflake has finite area.

In an iteration,, the number of new triangles T_n, Eq. 1, can be simplified to a_n

$$a_0 =$$

Δ, the initial equilateral triangle,, or

$$a_n = \frac{a_{n-1}}{9} = \ldots . \tag{3}$$

Eqs. 1 and 3

$$b_n == (\cdot 4^n) \, (a_0) = .$$

total area

$$
\begin{aligned}
A &= a + \sum_{k=1}^{n} b \\
&= a_0 \left(1 + ()^k\right) \\
&= .
\end{aligned}
$$

Now, since

$$\lim_{n} 3\,() = 0,$$

$\lim_{\to\infty} A_n$..

References

[1] Helge. *Sur une courbe continue sans tangente, obtenue par une construction géométrique élémentaire.*, Arkiv, Kungliga Vetenskapsakademien. **1**, 681-702,.