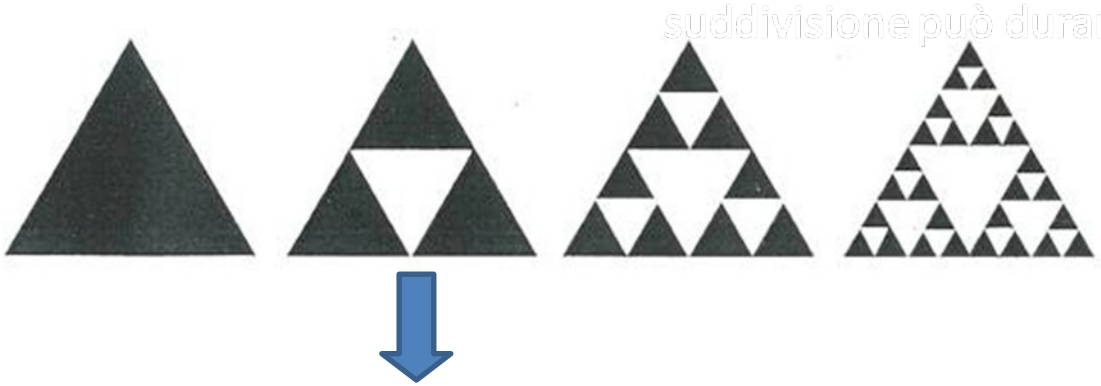
THE TRIANGLE OF SIERPINSKI

Wacław Sierpiński

- Waclaw Franciszek Sierpinski was a Polish mathematician founder of the school of mathematics, among the most important in the world, together with Stefan Banach and Kazimierz Kuratowski was one of the greatest Polish mathematicians.

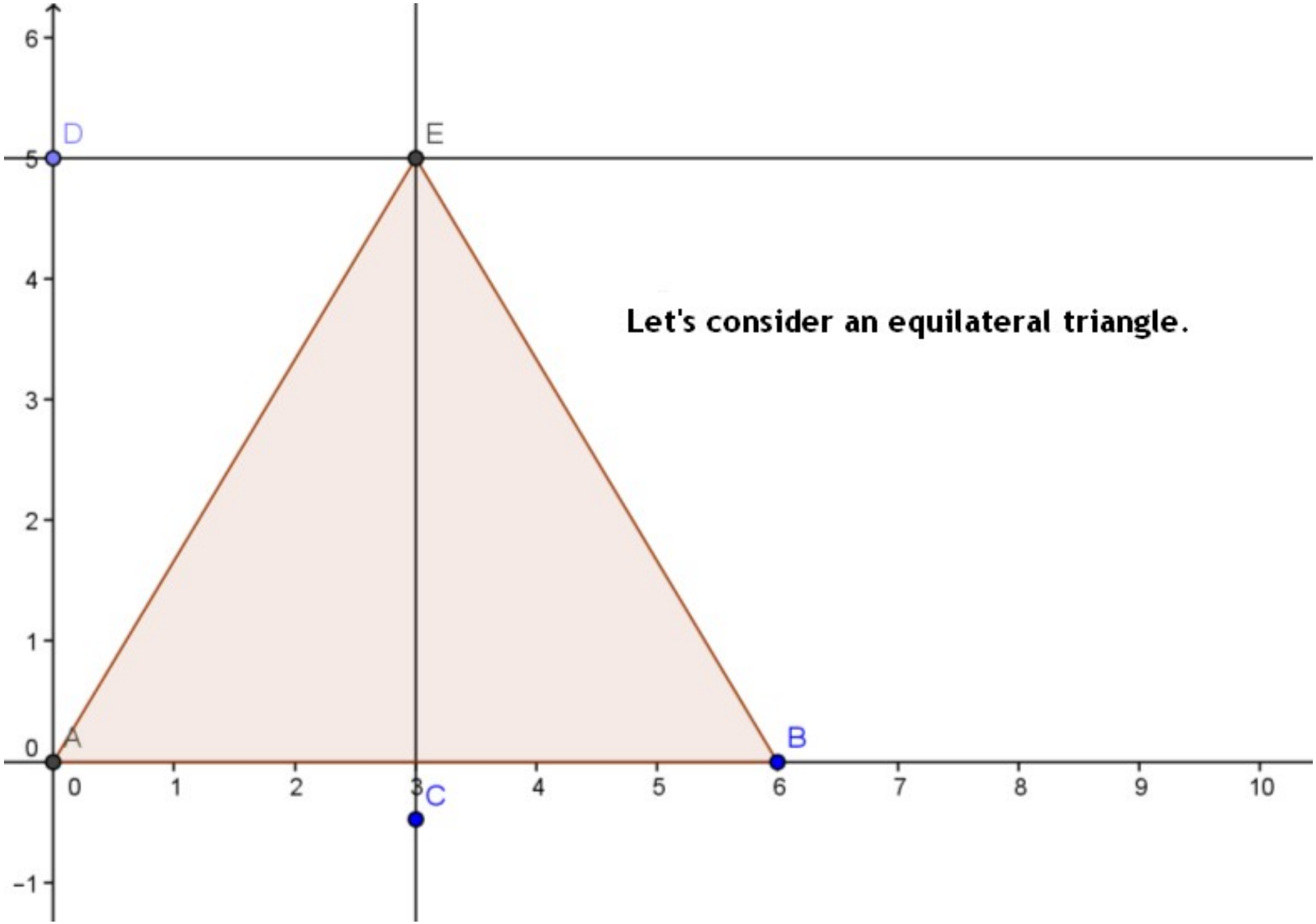
HOW TO BUILD THE TRIANGLE OF SIERPINSKI.

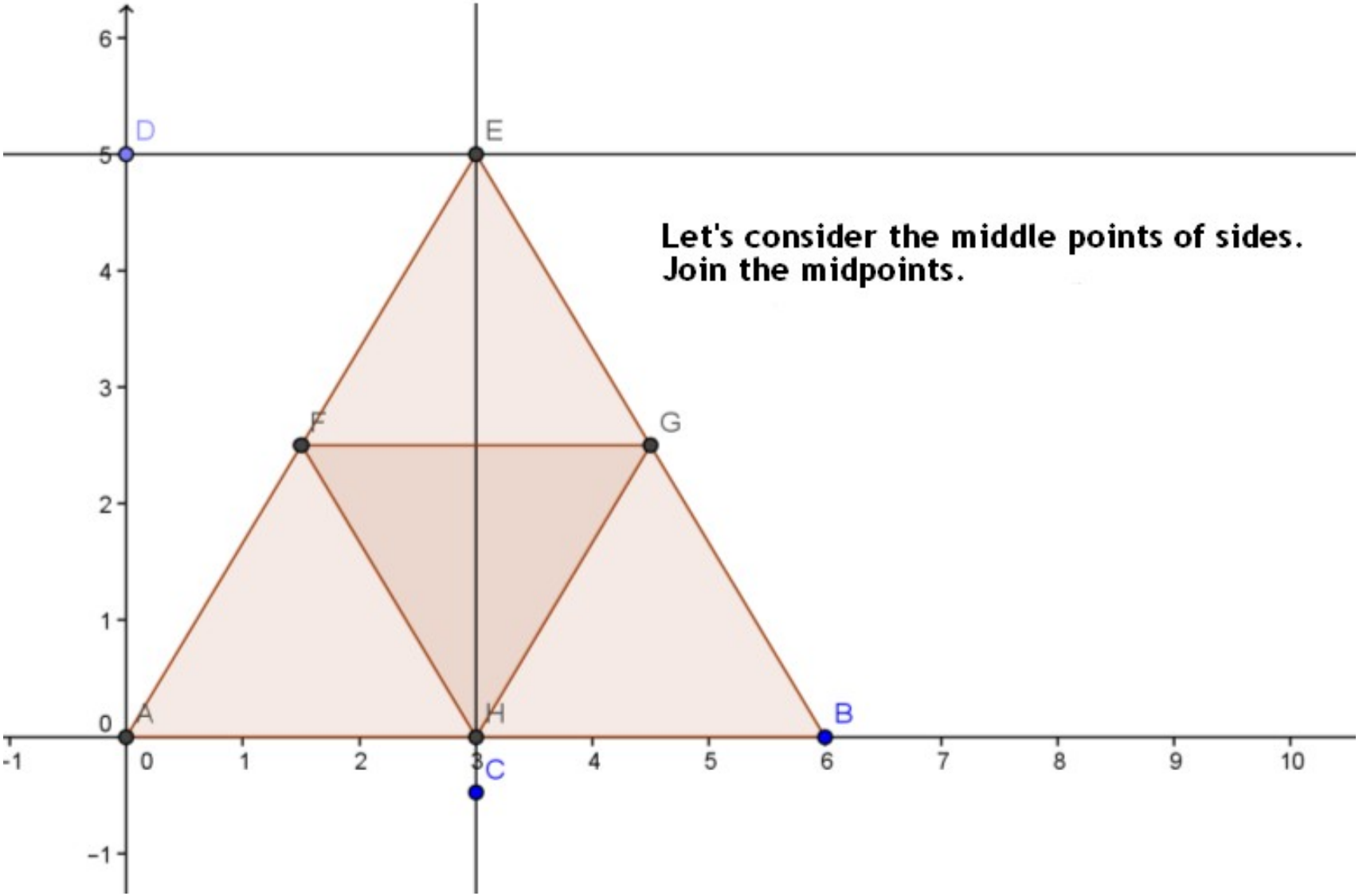
- Given an equilateral triangle, it is divided into 4 equilateral triangles; each of them it is divided again. We can apply the same process ad infinitum. After 3 iterations, here's how the triangle:

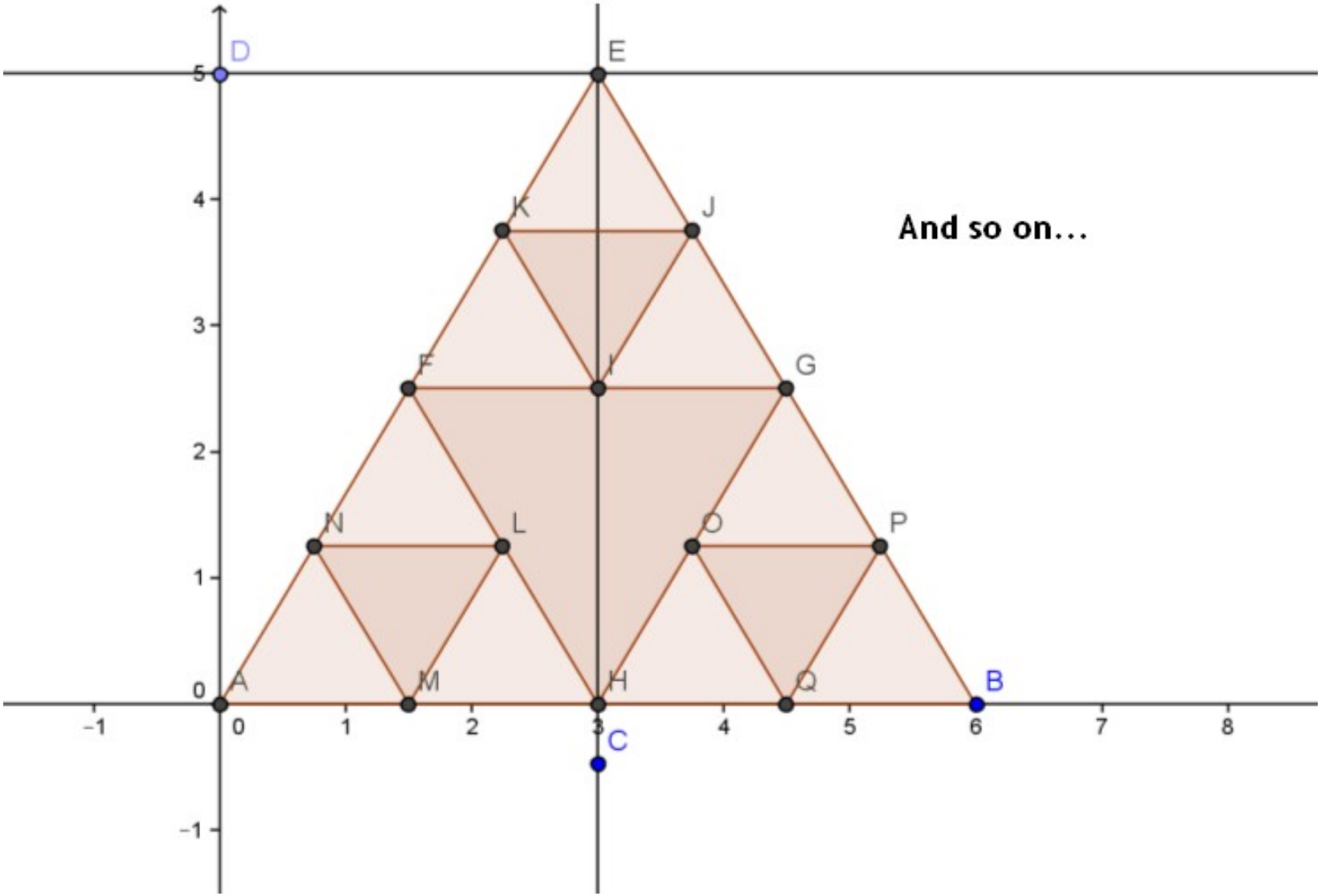


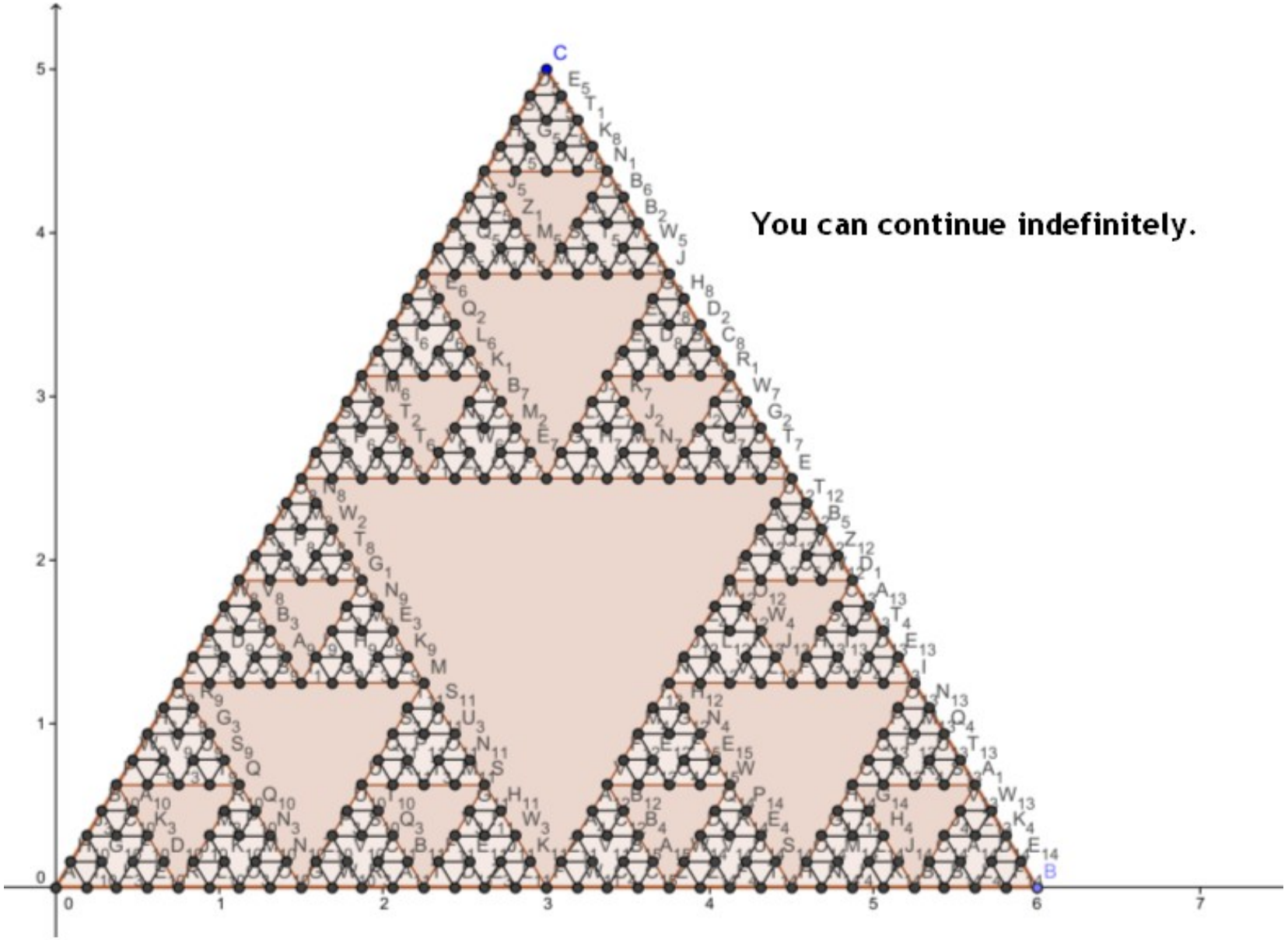
This division can last indefinitely

Taking always reference the midpoint


Let's consider an equilateral triangle.
D
E
A
B
C
6
5
4
3
2
1
0
−1
0
1
2
3
4
5
6
7
8
9
10


Let's consider the middle points of sides.
Join the midpoints.
D
E
F
G
A
H
B
C


D
E
K
J
F
I
G
N
L
O
P
A
M
H
Q
B
C
And so on…


C
B
You can continue indefinitely.

WHAT IS THAT?

- The Sierpinski triangle belongs to the class of geometric objects known as fractals. And this is one of the first in the history of mathematical fractals. Fractals are geometric shapes characterized by the repetition of a single reason to infinity of ever smaller scale. This is the most intuitive definition that can be given to figures that naturally occur with a frequency that is impressive but still do not have a precise mathematical definition: the current attitude is to consider a fractal set F that has properties similar to:

- -self-similarity

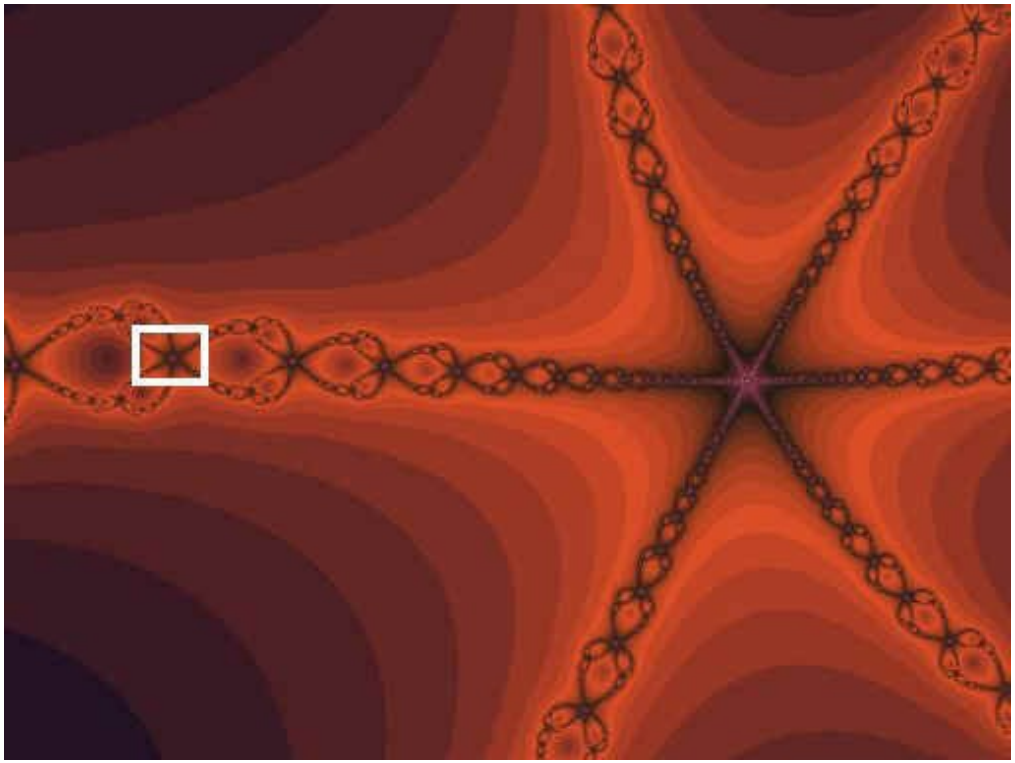
- - fine structure

- -irregularities

- -dimensions of self similarity of topological dimension

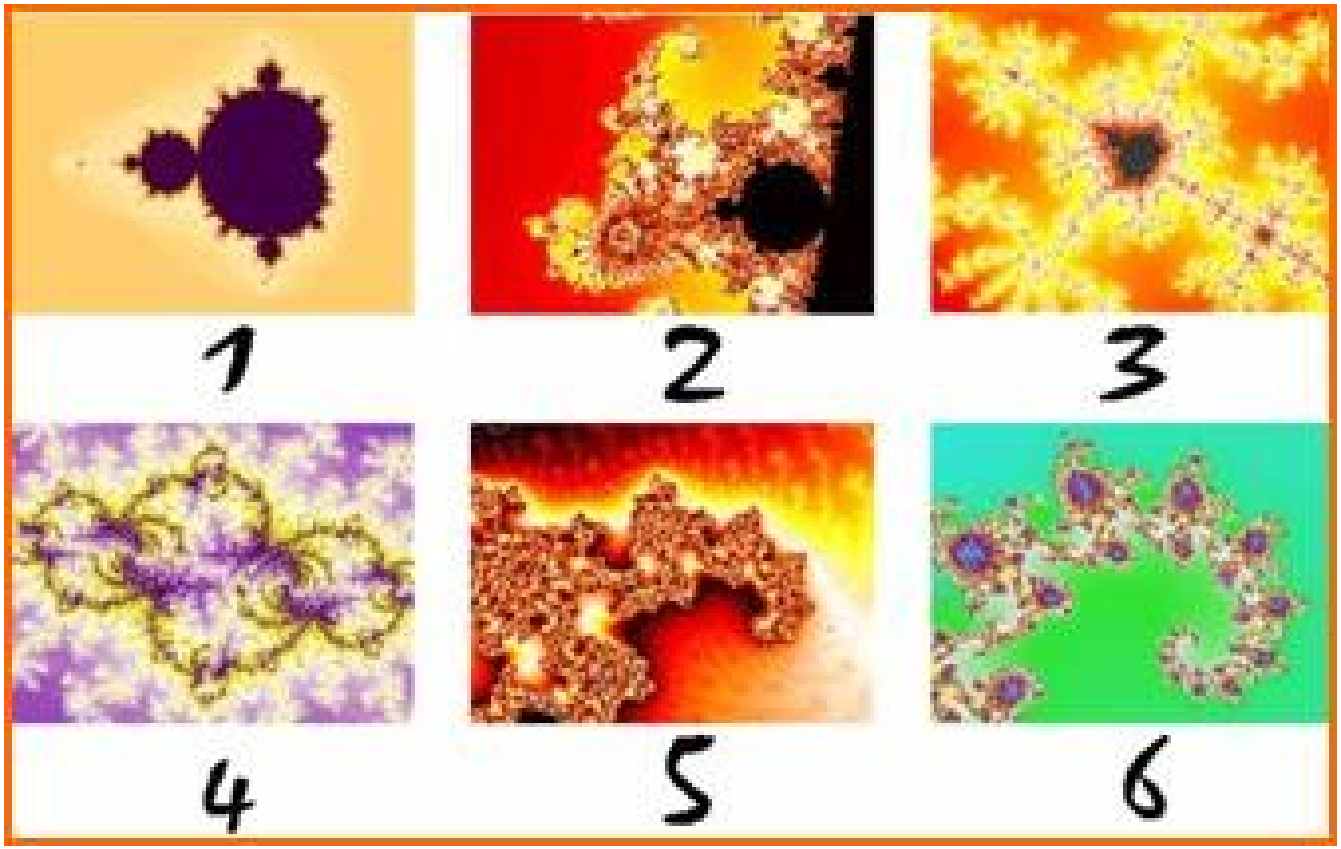
1) self-similarity

- F is the union of a number of parts, that enlarged by a certain factor, reproduce all F; in other words, F is a union of copies of itself at different scales.



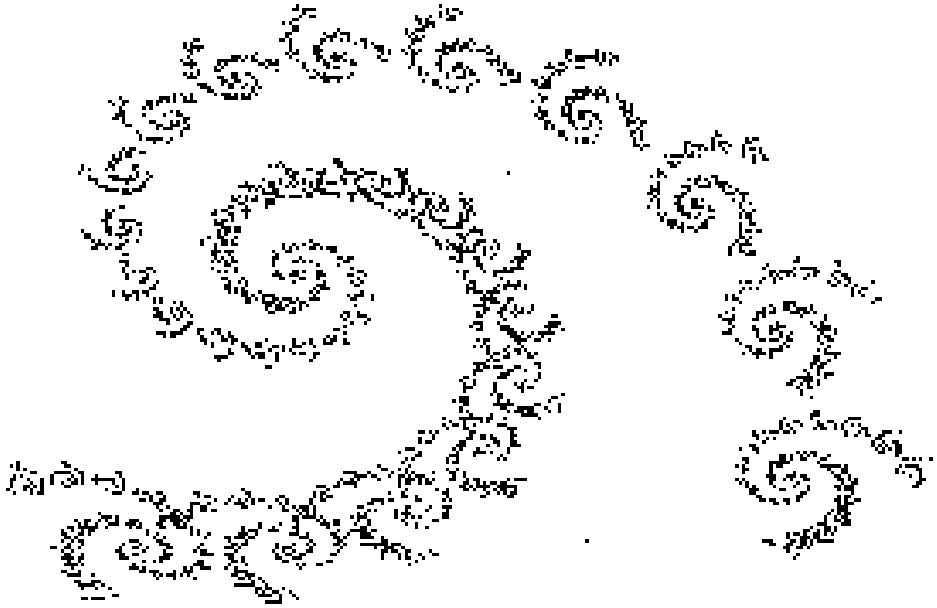
2) Fine structure

- F reveals details to every magnification.



3) Irregularities

- F can not be described as a locus of points that satisfy simple conditions geometric or analytic.



4) Size of self-similarity of topological dimension.

- "The characteristic of these figures, a feature from which their name is derived, is that although they may be represented in a conventional space to two or three dimensions, their size is not entire. In fact the length of a fractal "floor" can not be measured definitively, but depends strictly on the number of iterations to which undergoes the initial figure. “