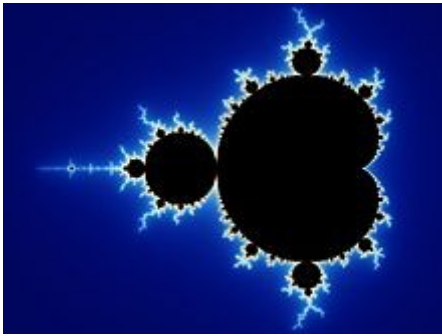# Fractal   From Wikipedia, the free encyclopedia

The [Mandelbrot set](#) is a famous example of a fractal

1) Read the text and underline definitions. Which grammar patterns do they use?

A **fractal** is "a rough or fragmented geometric shape that can be split into parts, each of which is (at least approximately) a reduced-size copy of the whole," a property called self-similarity. Roots of the idea of fractals go back to the 17th century, while mathematically rigorous treatment of fractals can be traced back to functions studied by Karl Weierstrass, Georg Cantor and Felix Hausdorff a century later in studying functions that were continuous but not differentiable; however, the term fractal was coined by Benoît Mandelbrot in 1975 and was derived from the Latin fractus meaning "broken" or "fractured." A mathematical fractal is based on an equation that undergoes iteration in a form of feedback based on recursion. There are several examples of fractals, which are defined as portraying exact self-similarity, quasi self-similarity, or statistical self-similarity. While fractals are a mathematical construct, they are found in nature, which has led to their inclusion in artwork. They are useful in medicine, soil mechanics, seismology, and technical analysis.

Because they appear similar at all levels of magnification, fractals are often considered to be infinitely complex (in informal terms). Natural objects that are approximated by fractals to a degree include clouds, mountain ranges, lightning bolts, coastlines, snow flakes, various vegetables (cauliflower and broccoli), and animal coloration patterns. However, not all self-similar objects are fractals—for example, the real line (a straight Euclidean line) is formally self-similar but fails to have other fractal characteristics; for instance, it is regular enough to be described in Euclidean terms.

Images of fractals can be created using fractal-generating software. Images produced by such software are normally referred to as being fractals even if they do not have the above characteristics, such as when it is possible to zoom into a region of the fractal that does not exhibit any fractal properties. Also, these may include calculation or display artifacts which are not characteristics of true fractals.

2. Answer Qs.   a) Who was the first to use the term "fractal?

b) Where can fractals be useful?

c) Is a straight Euclidean line a fractal? Why Y/N?

d) Where can you find fractals in nature?