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# fractal wikipedia

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in mathematics a fractal is a geometric shape containing detailed structure at arbitrarily small scales usually having a fractal dimension strictly exceeding the topological dimension many fractals appear similar at various scales as illustrated in successive magnifications of the mandelbrot set

# what are fractals fractal foundation

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fractals are infinitely complex patterns that are self similar across different scales they are created by repeating a simple process over and over in an ongoing feedback loop driven by recursion fractals are images of dynamic systems the pictures of chaos

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fractals are fundamental to understanding many chaotic systems and have many applications in sciences they are also beautiful and mesmerizing objects as we have seen with the mandelbrot and julia sets in this section we collect examples of fractals in all scales in nature

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take a tour through the magical world of natural fractals and discover the complex patterns of succulents rivers leaf veins crystals and more

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fractals are common in nature because of the surprisingly simple way they are made mathematically they also help us make sense of complexity and chaos and maybe even quantum weirdness

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you can create fractals with mathematical equations and algorithms but there are also fractals in nature at their most basic fractals are a visual expression of a repeating pattern or formula that starts out simple and gets progressively more complex

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fractal in mathematics any of a class of complex geometric shapes that commonly have fractional dimension a concept first introduced by the mathematician felix hausdorff in 1918

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fractals are mathematical sets usually obtained through recursion that exhibit interesting dimensional properties we ll explore what that sentence means through the rest of this section for now we can begin with the idea of self similarity a characteristic of most fractals

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fractals are exquisite structures produced by nature hiding in plain sight all around us they are tricky to define precisely though most are linked by a set of four common fractal features

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what is a fractal and how can fractals help us understand the universe classic examples of fractals in nature are broccoli and snowflakes

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a fractal is an object or quantity that displays self similarity in a somewhat technical sense on all scales the object need not exhibit exactly the same structure at all scales but the same type of structures must appear on all scales

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fractals are complex never ending patterns created by repeating mathematical equations yuliya an undergrad in math at mit delves into their mysterious properties and how they can be found in technology and nature

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in mathematics we call this property self similarity and shapes that have it are called fractals they are some of the most beautiful and most bizarre objects in all of mathematics to create our own fractals we have to start with a simple pattern and then repeat it over and over again at smaller scales

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fractals are complex geometric shapes or mathematical sets that exhibit self similarity at different scales meaning that every part of the fractal looks very similar to the whole image regardless of how zoomed in or zoomed out you are

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fractals are mathematical sets usually obtained through recursion that exhibit interesting dimensional properties we ll explore what that sentence means through the rest of the chapter for now we can begin with the idea of self similarity a characteristic of most fractals

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a fractal is a type of mathematical shape that are infinitely complex in essence a fractal is a pattern that repeats forever and every part of the fractal regardless of how zoomed in or zoomed out you are it looks very similar to the whole image fractals surround us in so many different aspects of life

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now researchers in japan have shown that ais can start learning to recognize everyday objects by being trained on computer generated fractals instead it s a weird idea but it could be a big deal

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fractals have received international attention and have motivated myriad in depth studies they have reached wide recognition in popular culture and are now considered some of the most beautiful mathematical and in a larger sense visual wonders

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fractals are complex because they possess structural similarity across scales exact fractals are built by precisely repeating a pattern at different magnifications

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