



**ROSES**  
NATURES MATH MAGIC

**Colourful Facts**

You are welcome to print and share to celebrate Timaru. But artwork is not to be used for financial gain. Artwork By Roselyn Fauth © WuHooTimaru 2019

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# Wuhoo Timaru

Colourful Facts: Timaru's links to Rose History



## Reflect On Rose's Beauty, Symmetry, And History.

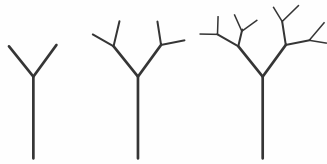
The rose's shape reflects millions of years of evolution, shaped by patterns of math found in nature. Over the last few centuries, people have bred roses to have specific traits, like more petals, vibrant colors, or stronger scents. But all modern roses trace back to wild roses and their wild mathematical beauty.

Wild (Species) roses evolved to have five simple petals and grew in patterns based on the Fibonacci sequence. (A series of numbers like this: 0, 1, 1, 2, 3, 5, 8, 13, 21..., where each number is the sum of the two before it). Roses use this pattern to arrange their petals, leaves, and seeds in spirals, helping them catch sunlight and attract pollinators.

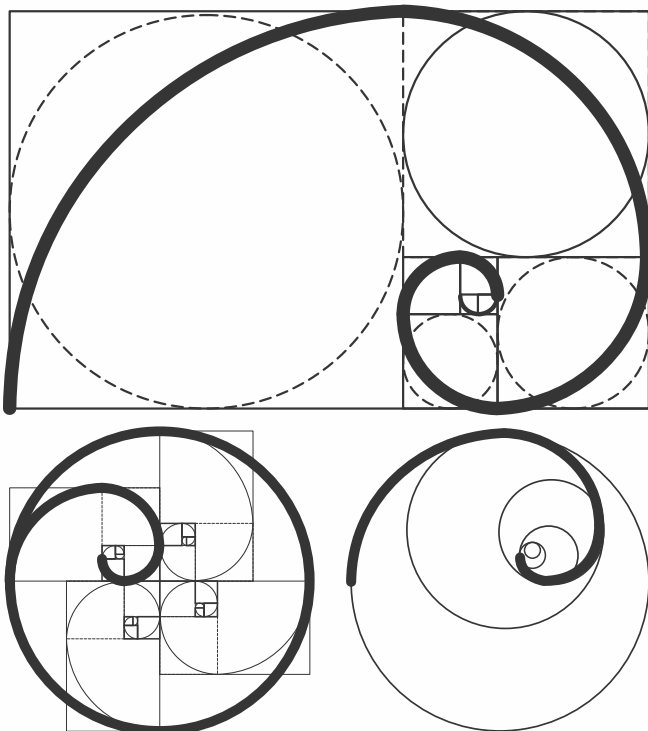
The golden ratio, approximately 1.618, is a special number that describes a perfect proportion found in spirals and other natural patterns. As the Fibonacci sequence grows, the ratio of one number to the previous one gets closer and closer to the golden ratio.

The leaves and stems grow in a branching pattern, repeating smaller versions of the same shape like a fractal.

Fractals are shapes that repeat themselves in smaller and smaller parts, just like how branches of trees split off.



Fibonacci Sequence = Add the two previous numbers together to get the next number. Golden Ratio = Divide two numbers (like  $21 \div 13$ ) and get a result that gets closer to 1.618.

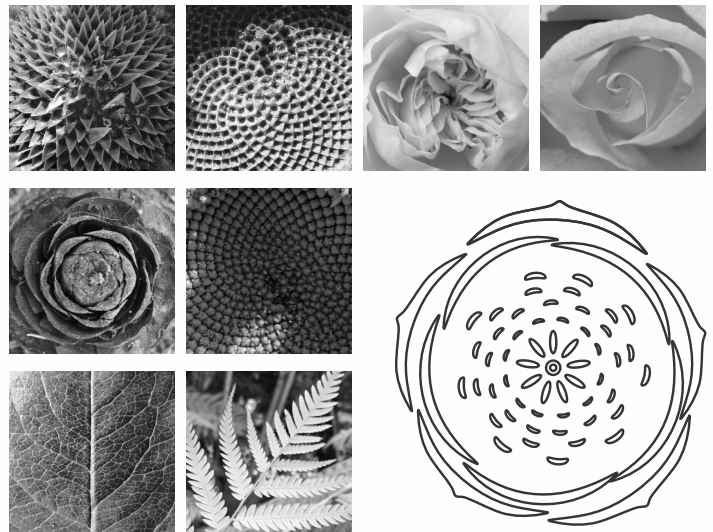


Rose petals form around a central point, mirroring the overall structure of the flower.

- **Roses petals grow in spirals, like a swirl, which follows the math pattern called the Fibonacci sequence.**
- **This spiral pattern helps roses catch sunlight and attract bees Roses and helps them grow strong and healthy.**
- **The special spiral shape of roses is also found in nature in things like pine cones, seashells, and even galaxies.**
- **Roses grow in layers, and each layer looks a little like the whole flower—a bit like fractal patterns you see in trees, ferns, and even broccoli, repetition at different scales.**
- **Branching Stems: The way rose stems and leaves branch out from the main stem follows a repeating pattern that looks similar on different parts of the plant.**
- **Rose windows in churches are inspired by the layered patterns of real roses, symbolizing heaven and harmony.**

*Next time you see a rose, study its structure. Can you see nature's math magic!*

Can you spot how the golden ratio and fractals repeat in nature? Roses, ferns, sunflowers, daisies, and pinecones are fun to study.



Structural Representation of a Rose  
Used in botany to describe the floral formula and parts