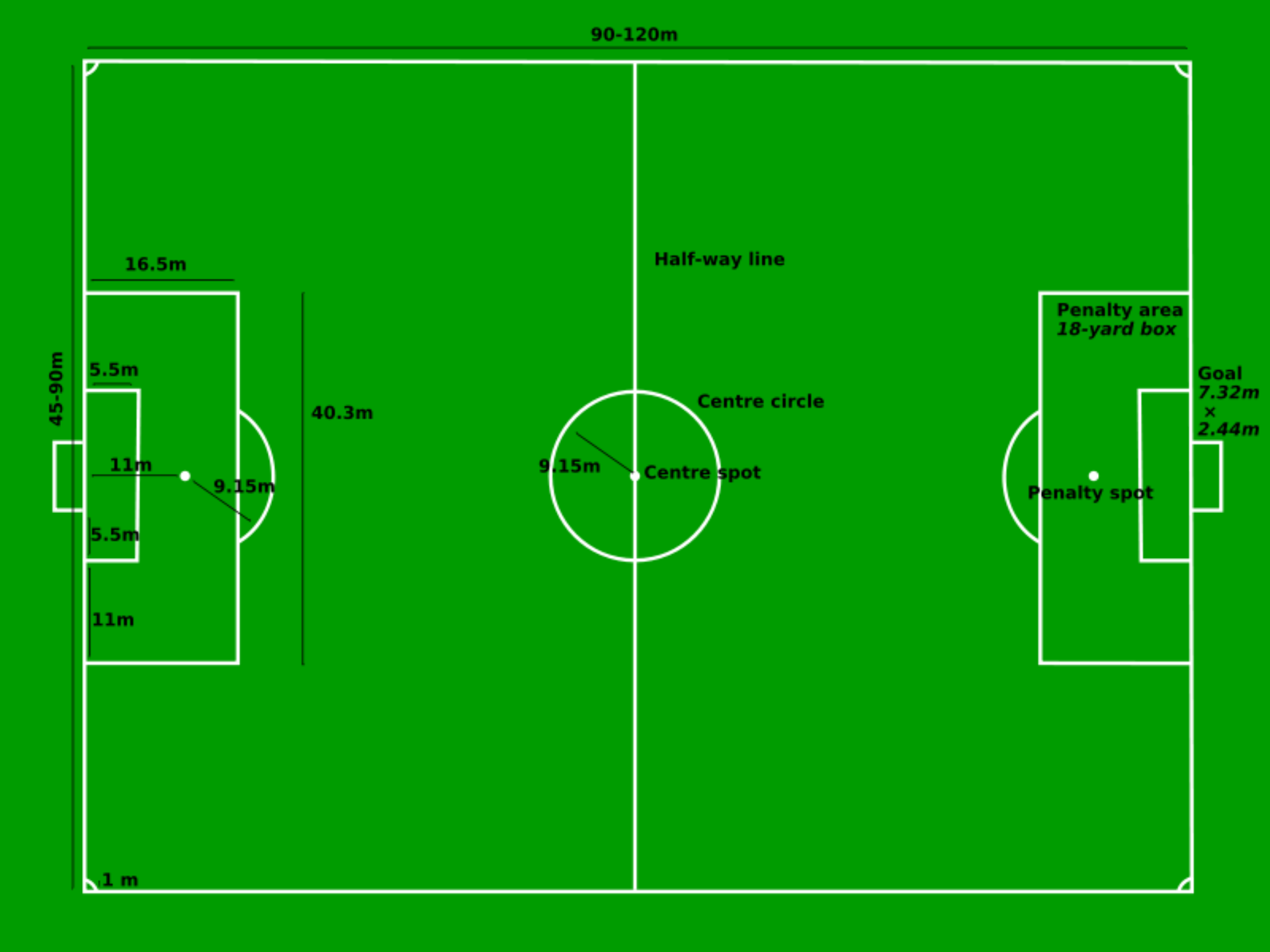

espirais

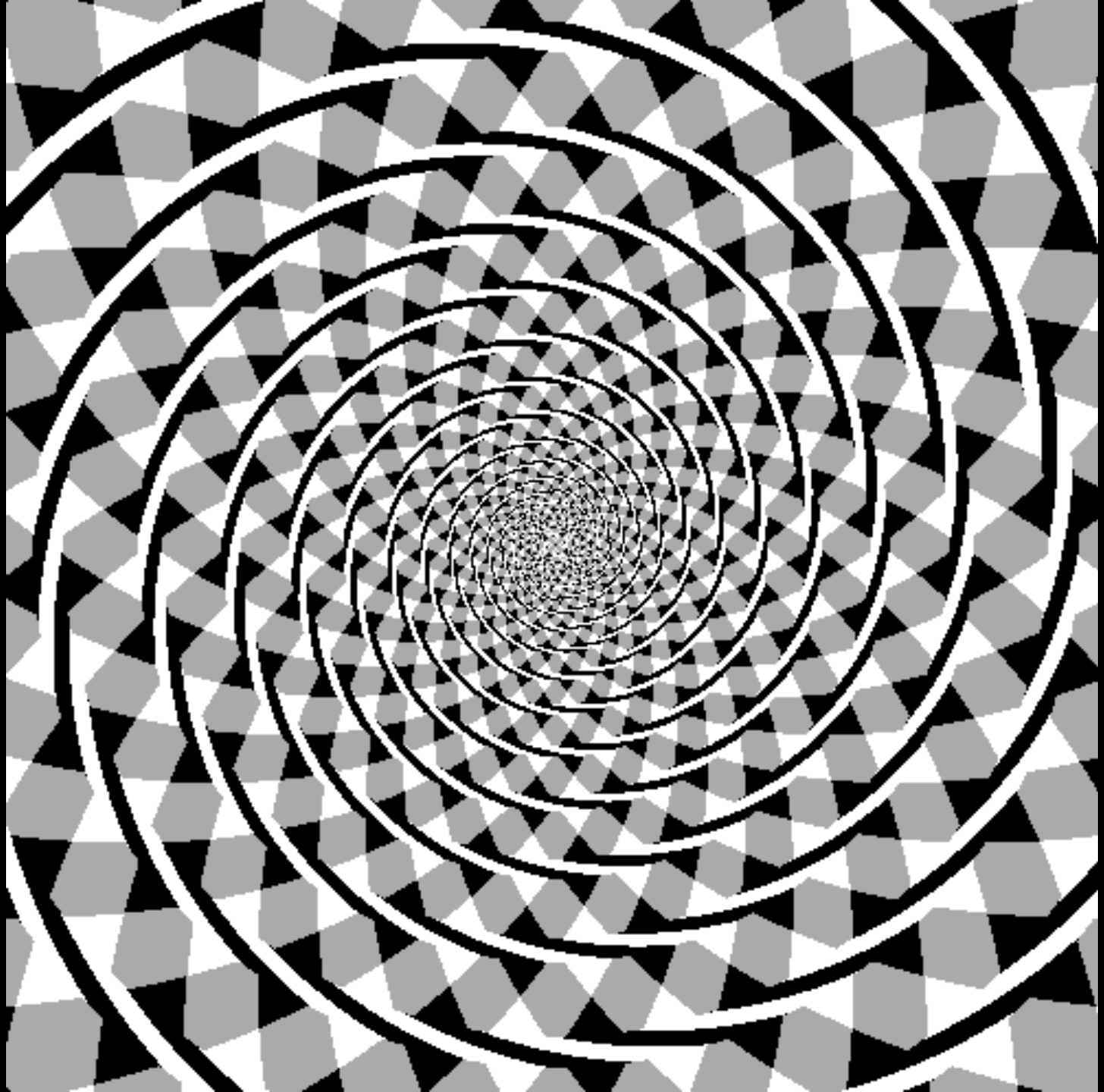
A spiral winds in a continuous curve round a point.


90-120m
45-90m
16.5m
5.5m
11m
9.15m
5.5m
11m
40.3m
Half-way line
Centre circle
9.15m
Centre spot
Penalty area
18-yard box
Goal
7.32m
×
2.44m
Penalty spot
1 m


YORKIE

Some spirals are man made.

Others are found in natural things such as plants and animals.




Wheel, circle, cycle-- revolution. Rotate, circulate, sing-- rock 'n roll. Wheel, spokes, hub going in / going out all the paths lead around. The moon goes around the Earth. The Earth goes around the wheel of the year-- death and rebirth. The wheel can't balance in place. We orbit around the boundary of our time. History is a record of change. The DNA of the Universe is a spiral. It comes round that's the power of the wheel-- constant change.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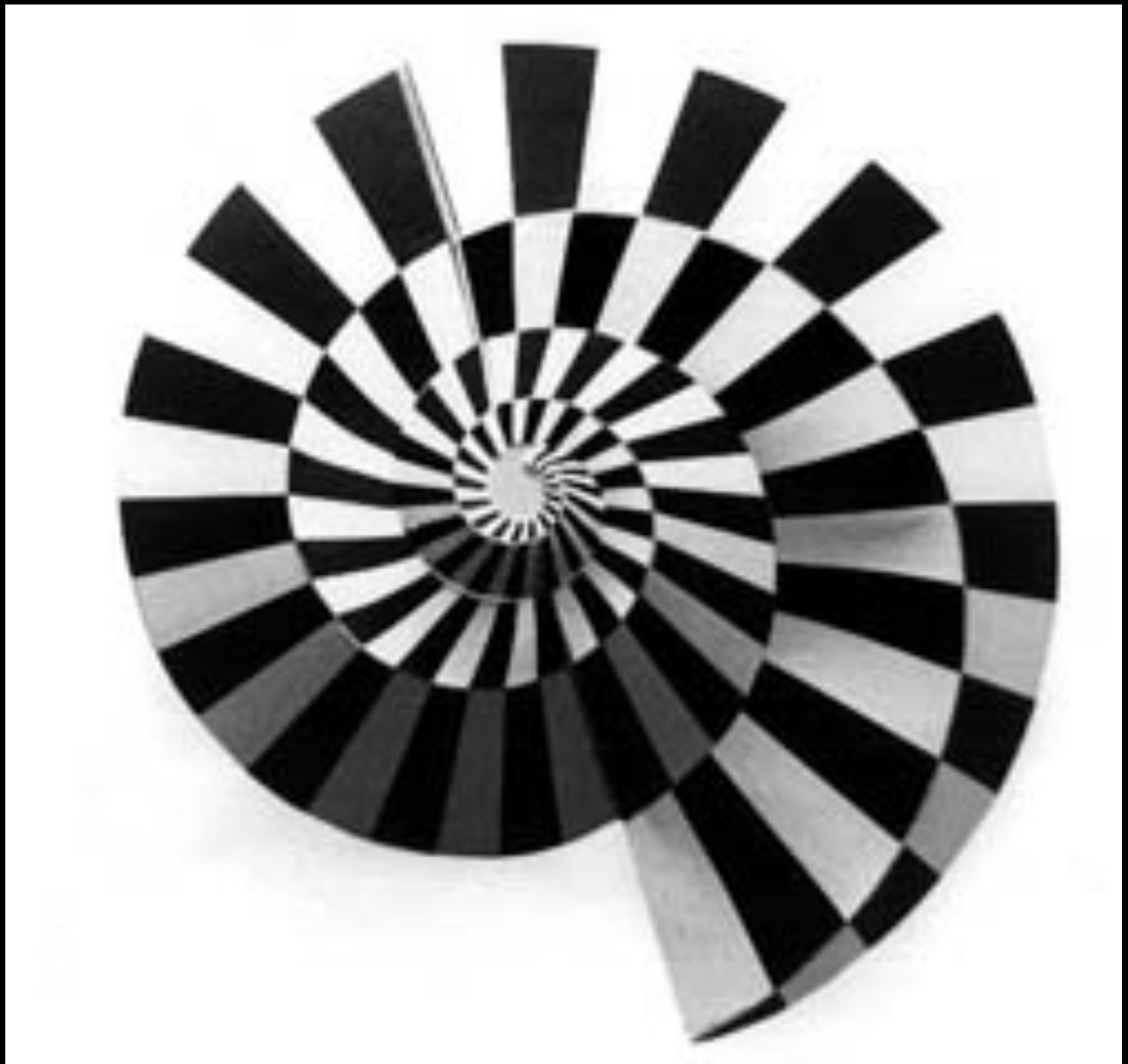
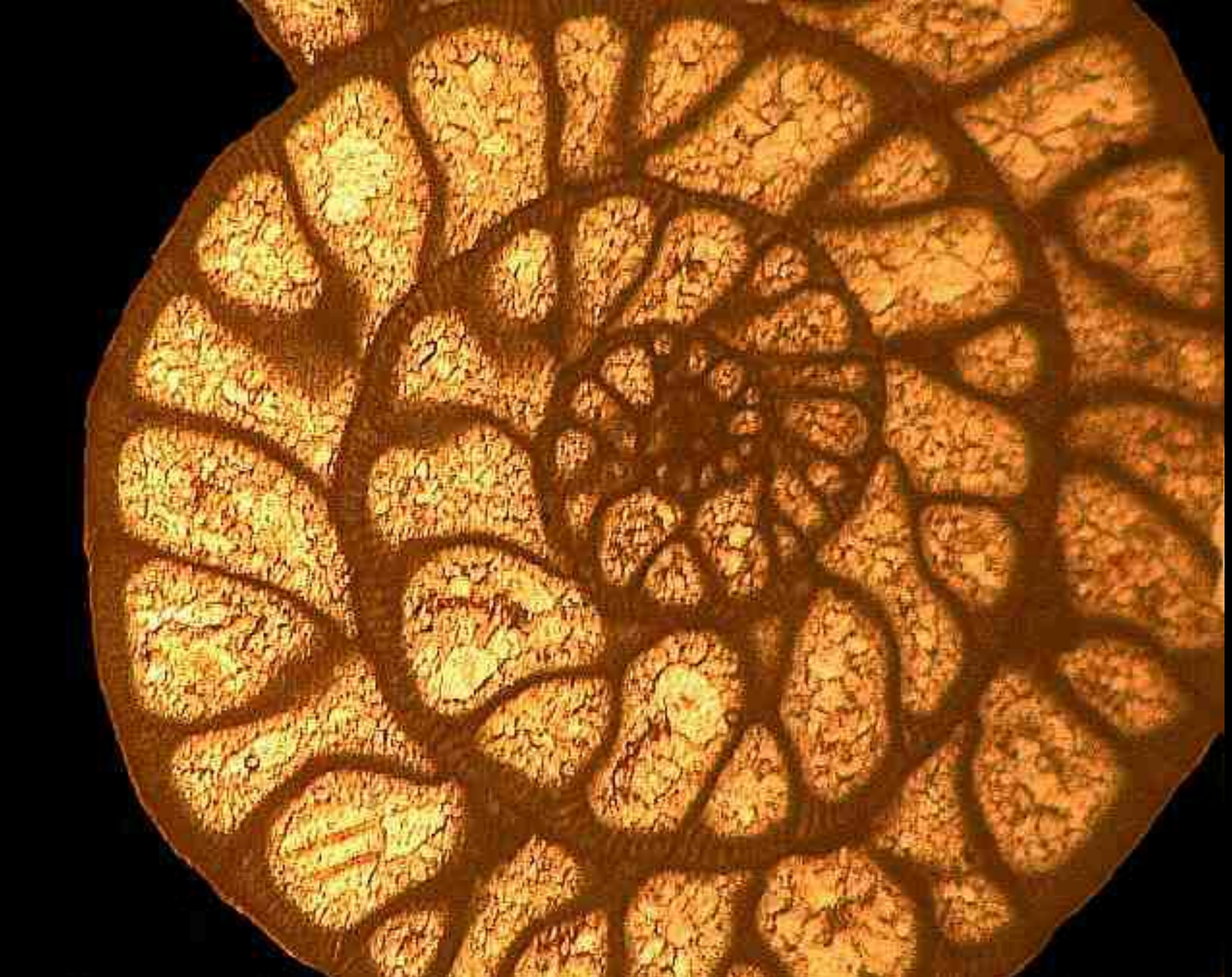
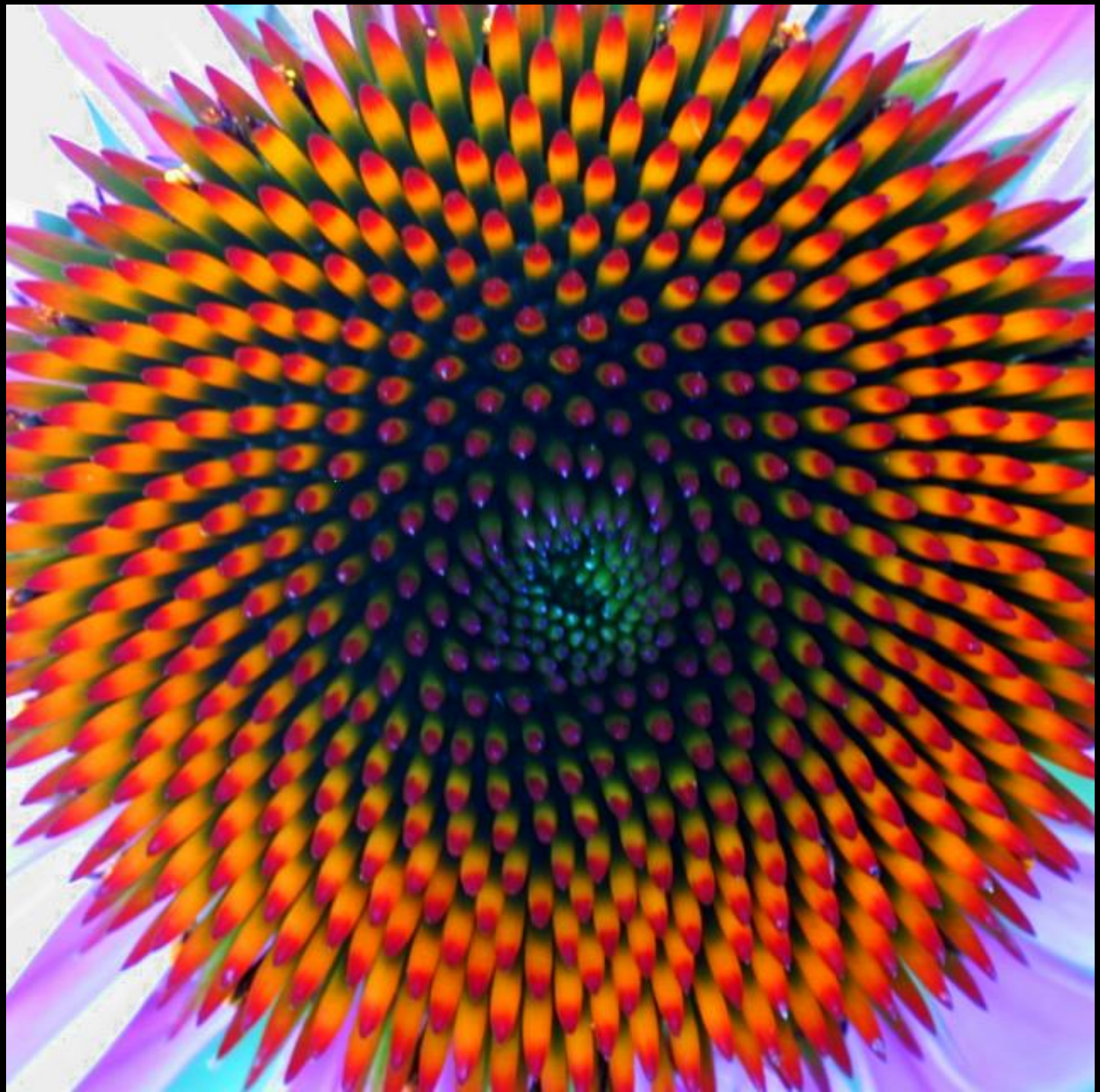
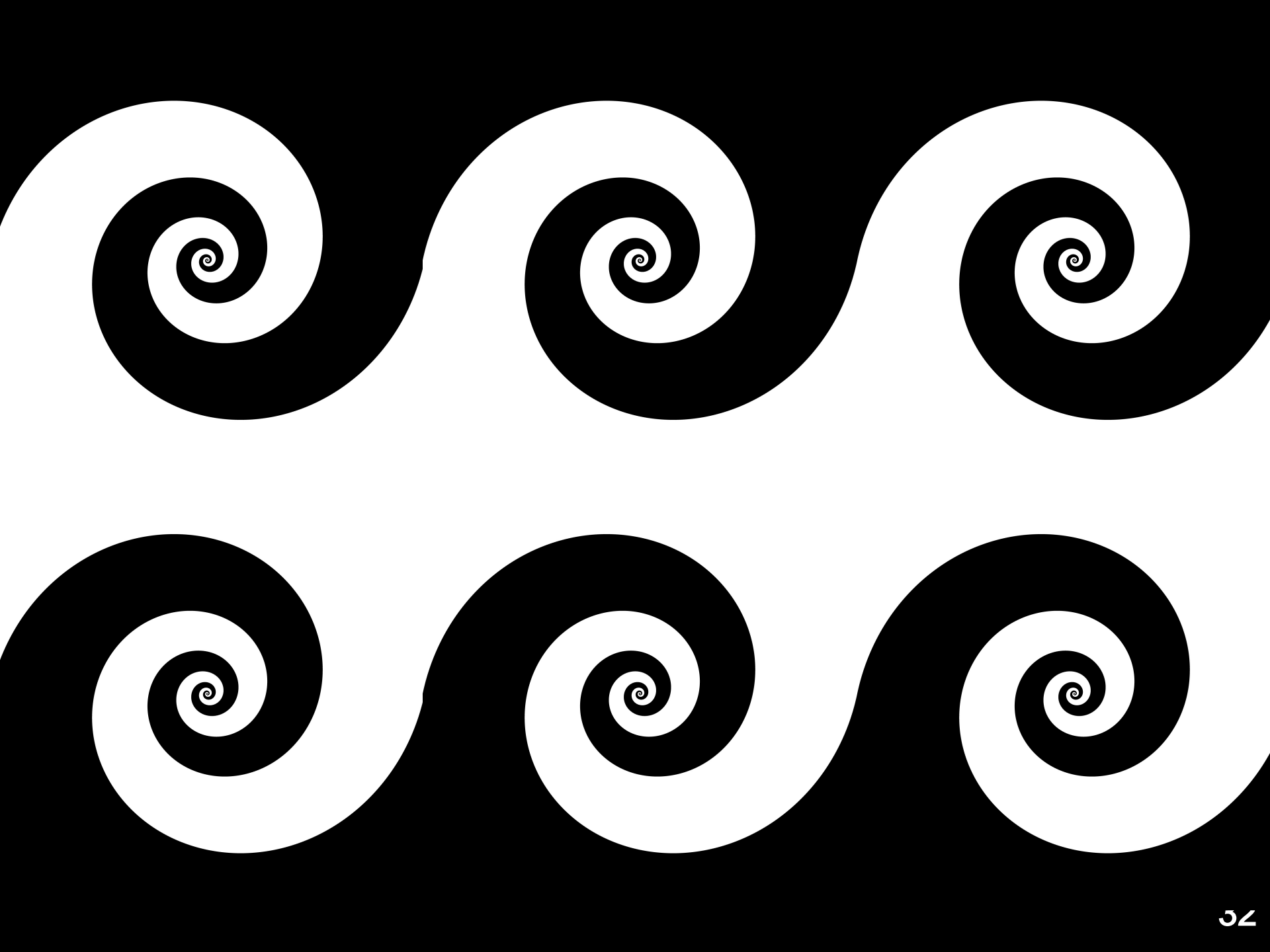
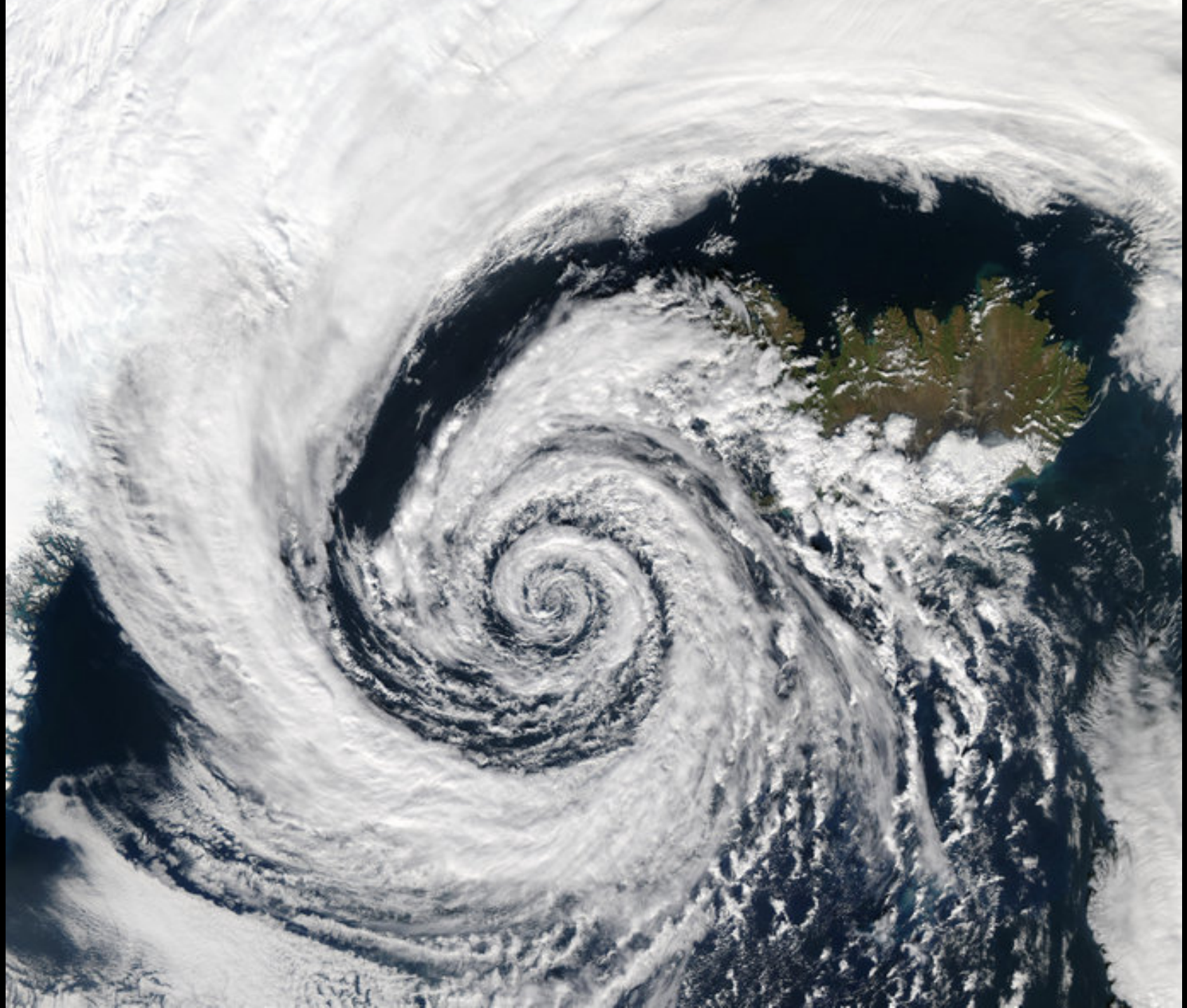


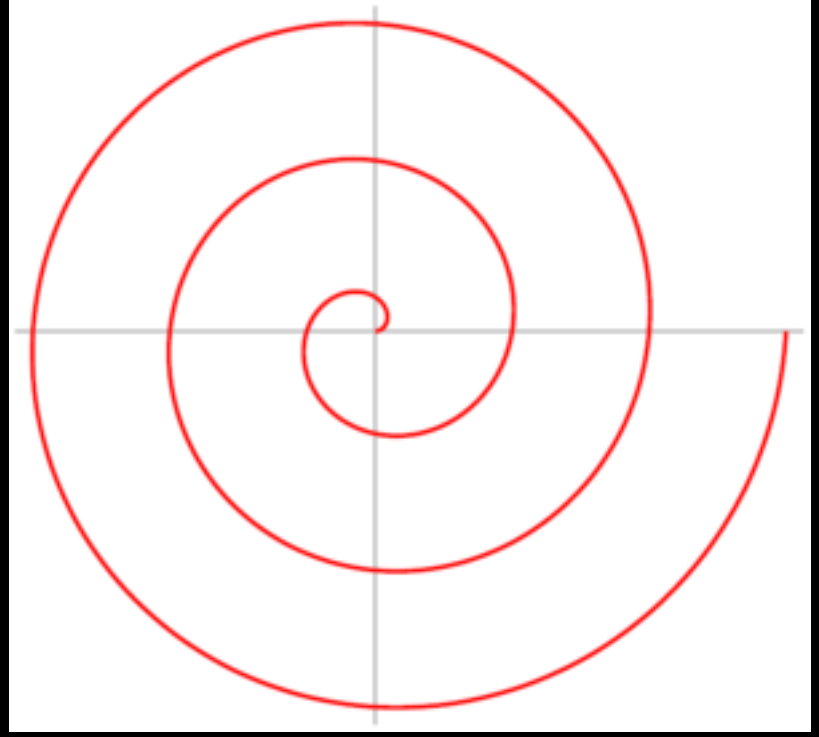






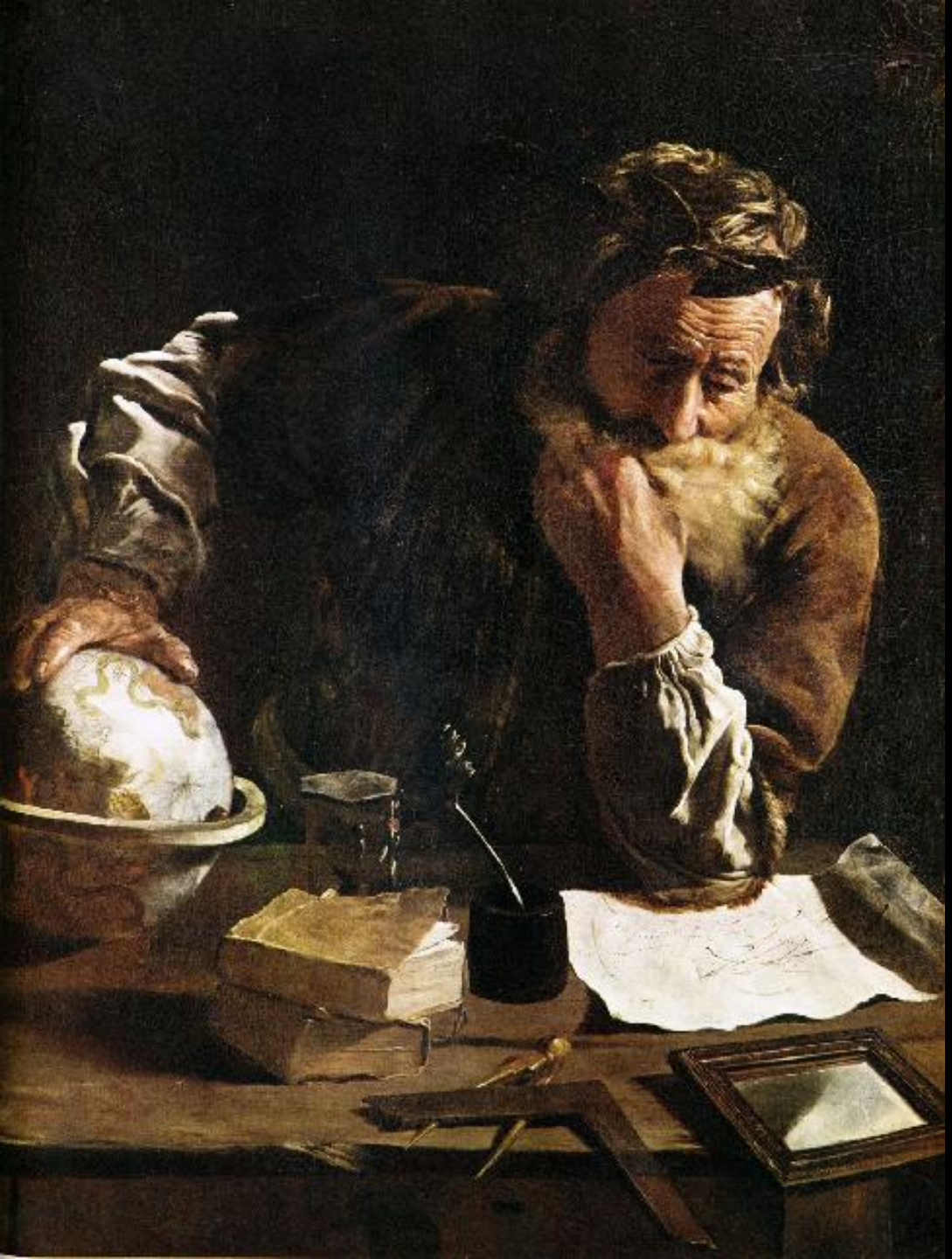



Spirals in Circles



This type of spiral is called an Archimedean spiral after the Greek mathematician Archimedes.

In an Archimedean spiral the gap between the curves of the spiral stays the same.



Archimedes was a mathematician who lived in Greece from 287 BC to 212 BC.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Glasgow
Belfast
Dublin
Isle of Man (U.K.)
Manchester
London
North Sea
Amsterdam
NETH.
Brussels
Celtic Sea
Guernsey (U.K.)
Jersey (U.K.)
Lille
BELGIUM
LUX.
Paris
FRANCE
Hamburg
Cologne
Berlin
GERMANY
Luxembourg
Munich
LIECH.
SWITZ.
Bern
Lyon
Bordeaux
MONACO
Marseille
Turin
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HUNGARY
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CROATIA
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Sarajevo
SER. & MONT.
Belgrade
ROMANIA
Bucharest
Sofia
BULGARIA
Skopje
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L'viv
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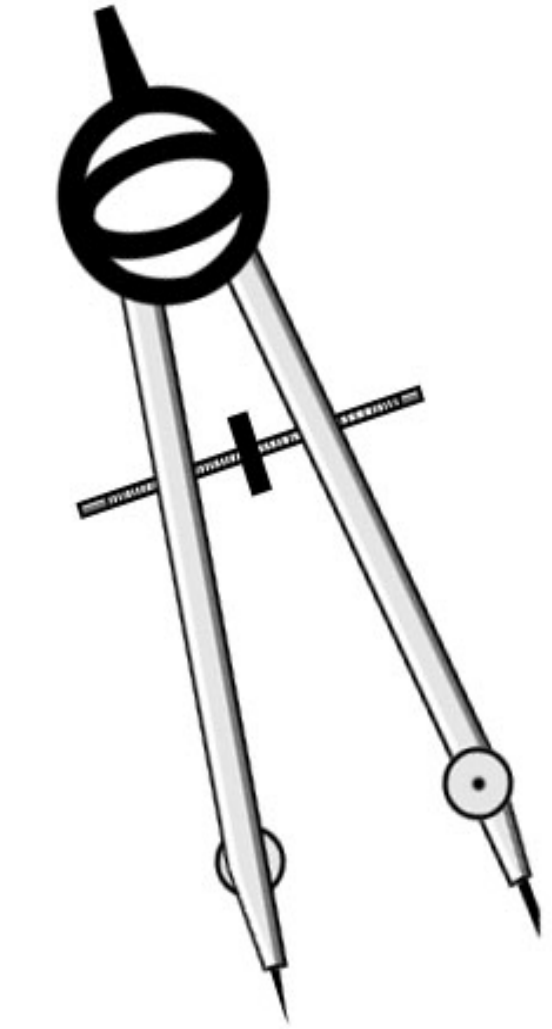
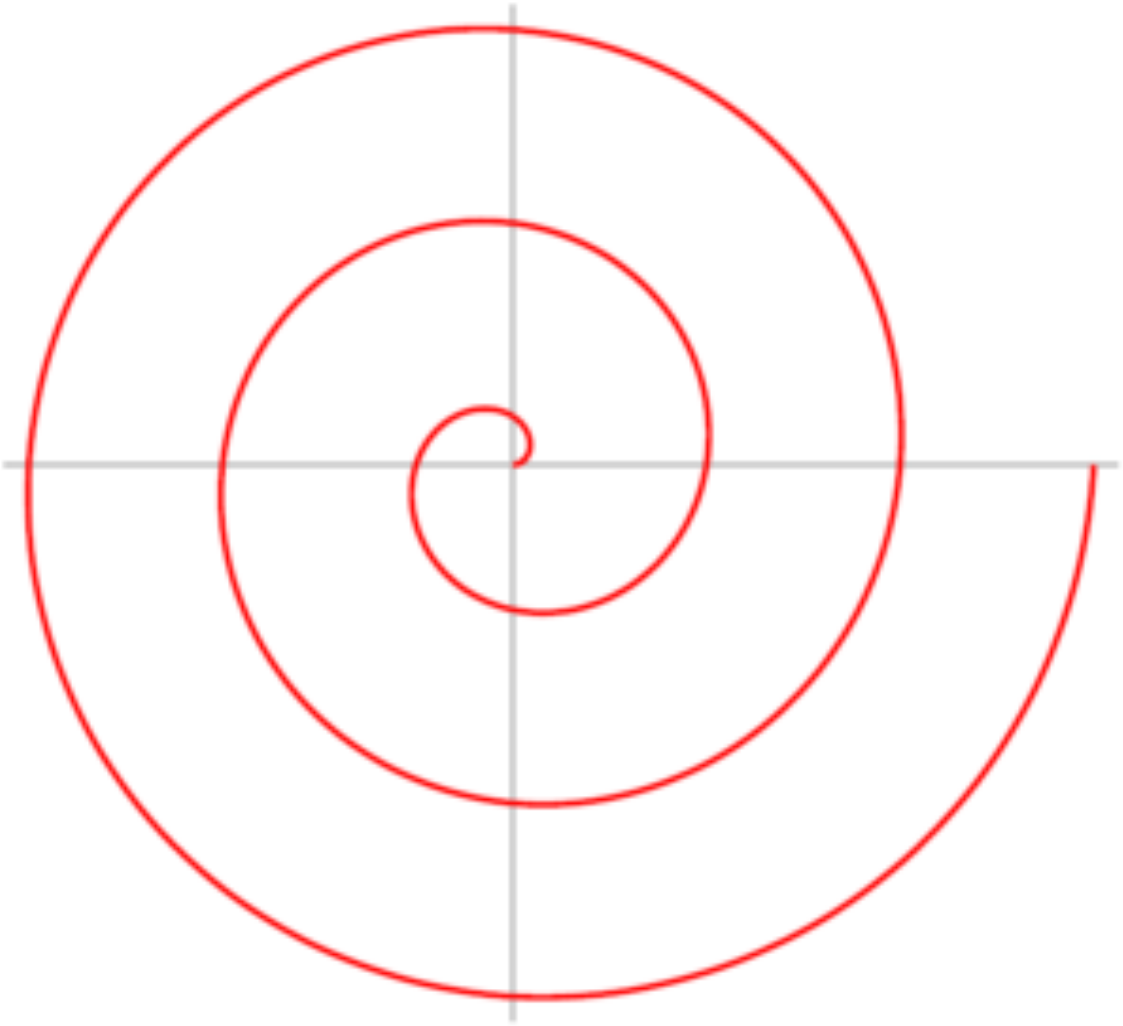
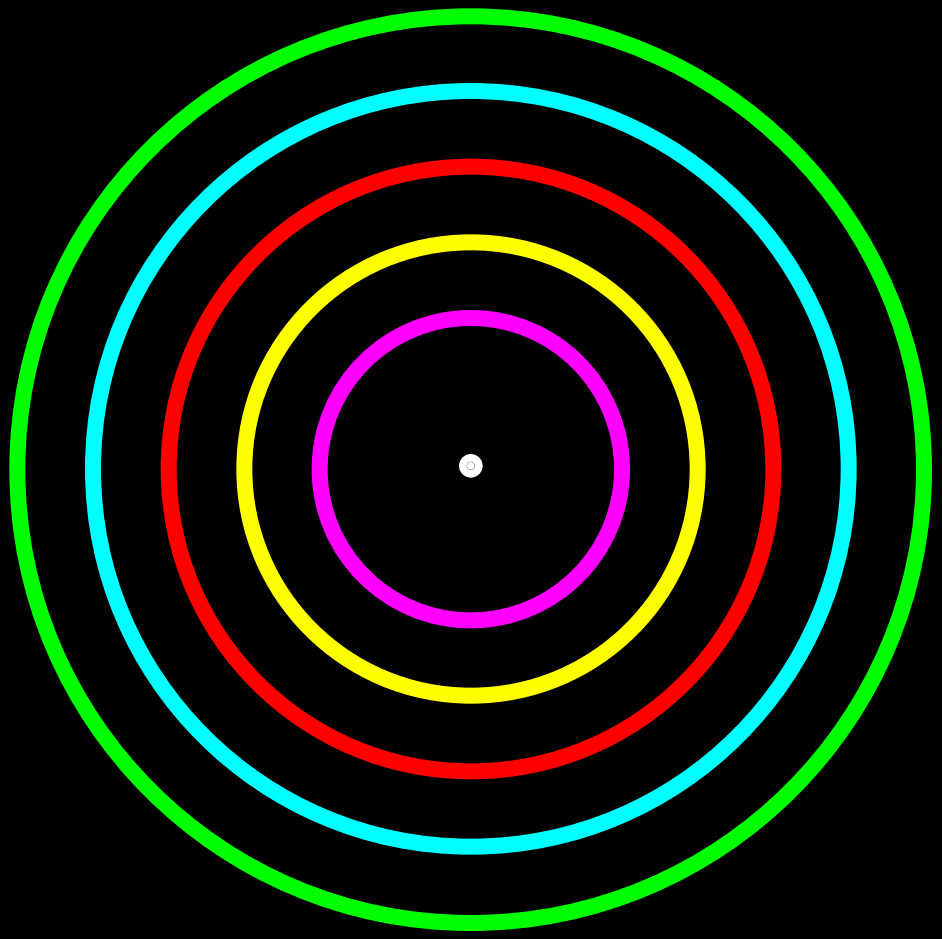
Kharkiv
Donets'k
MOLDOVA
Chisinau
Odesa
Black Sea

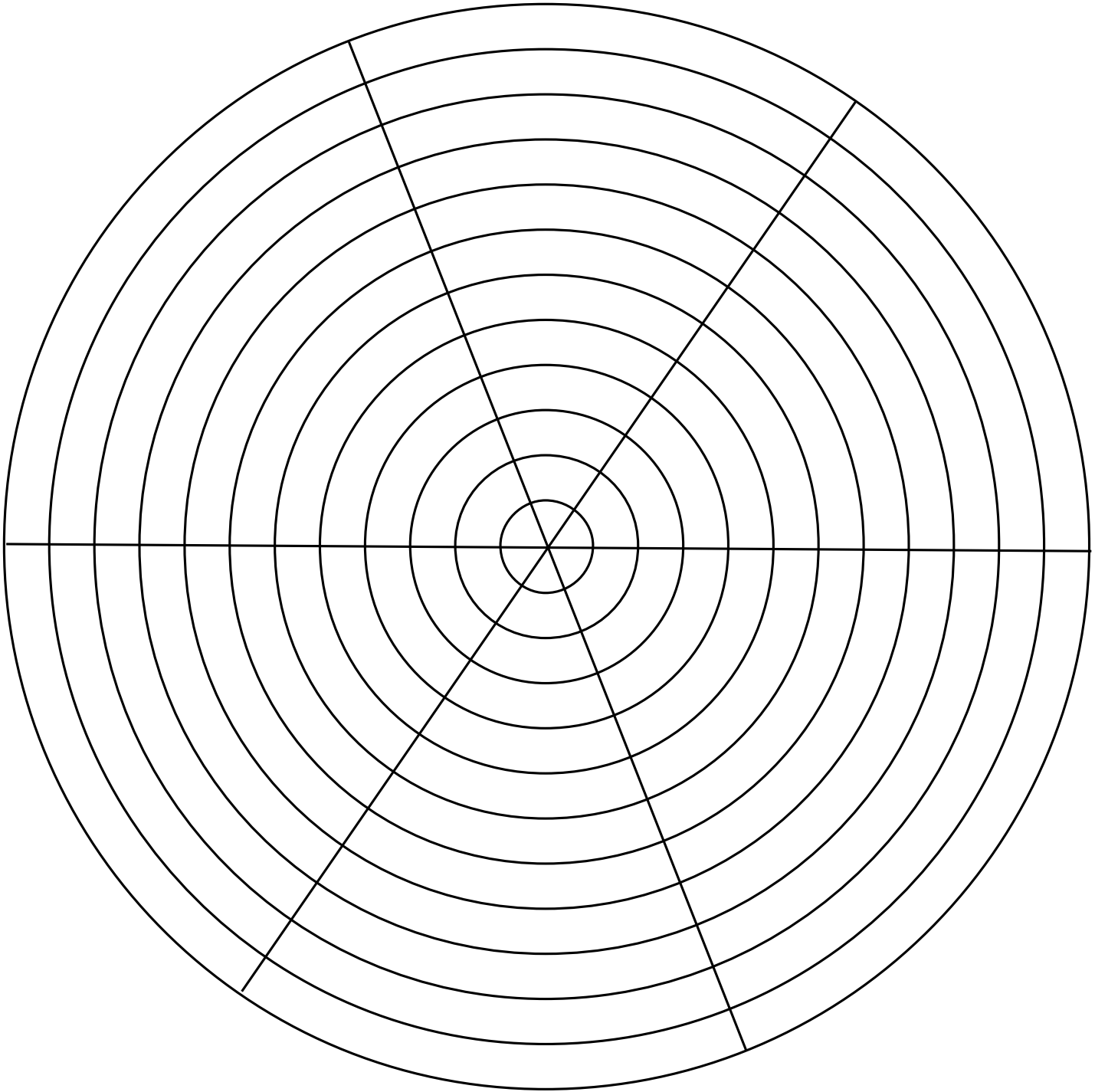
Archimedes drew a special spiral by pulling the legs of a pair of compasses apart while turning the compasses.

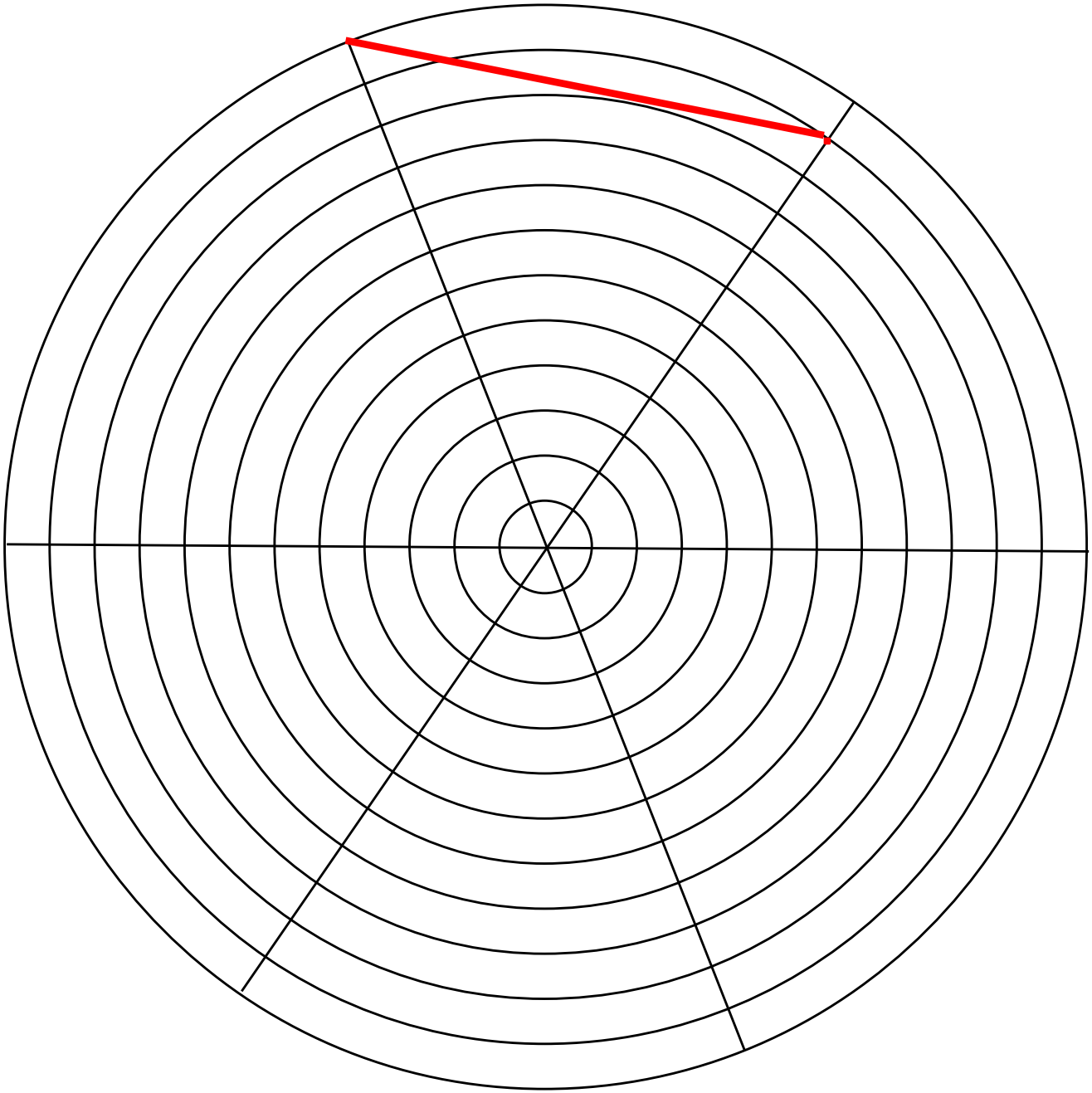


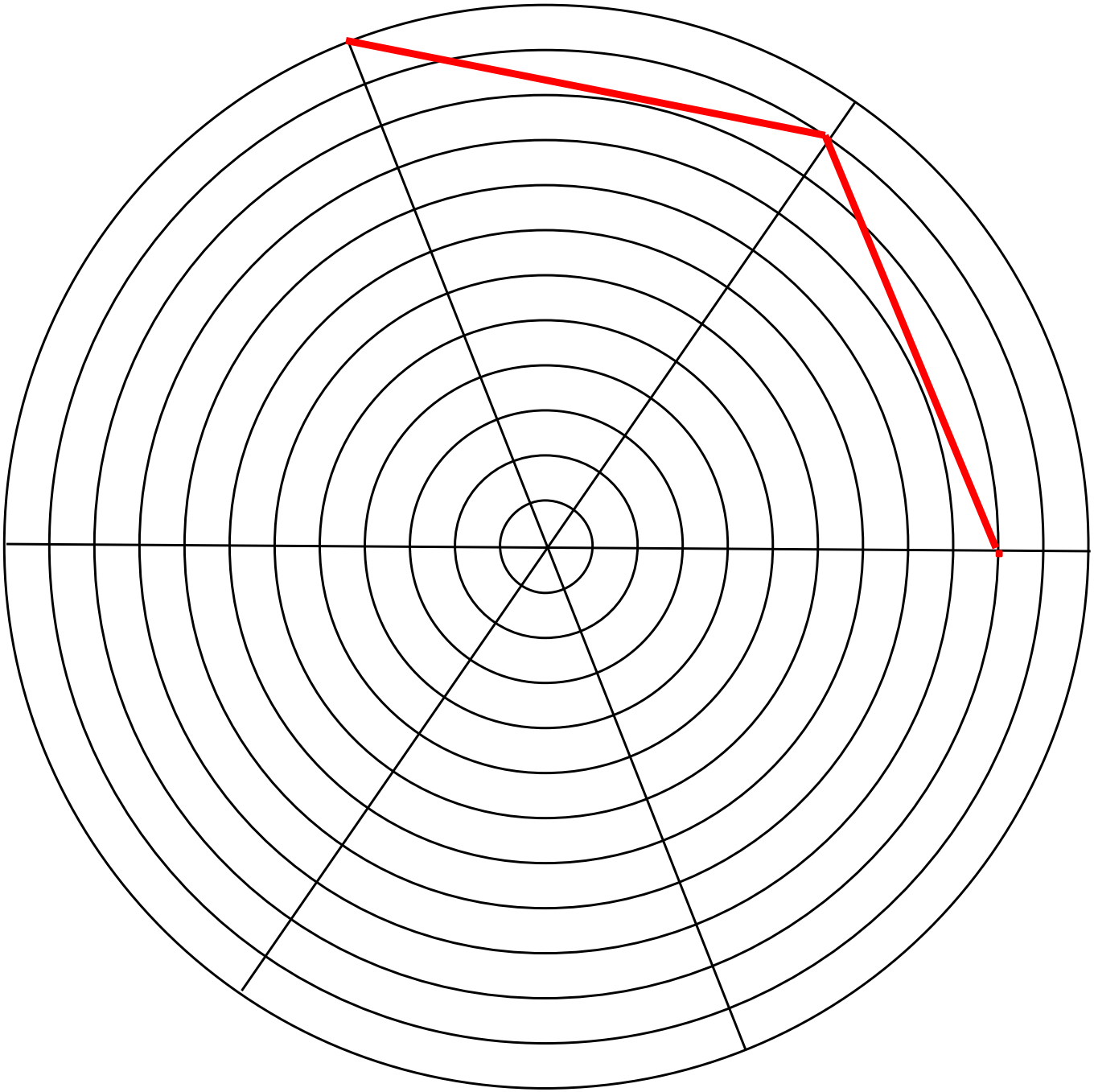


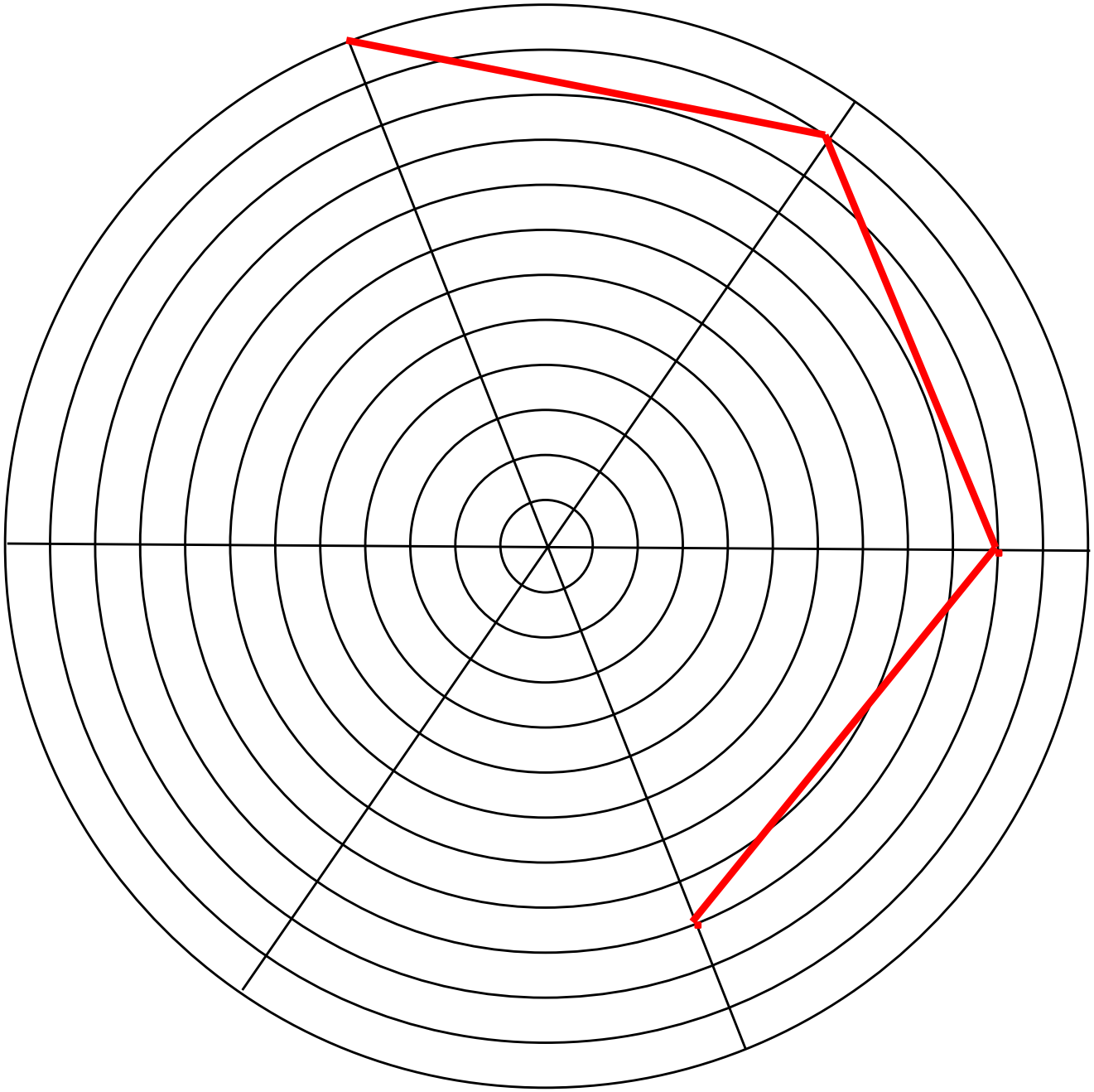


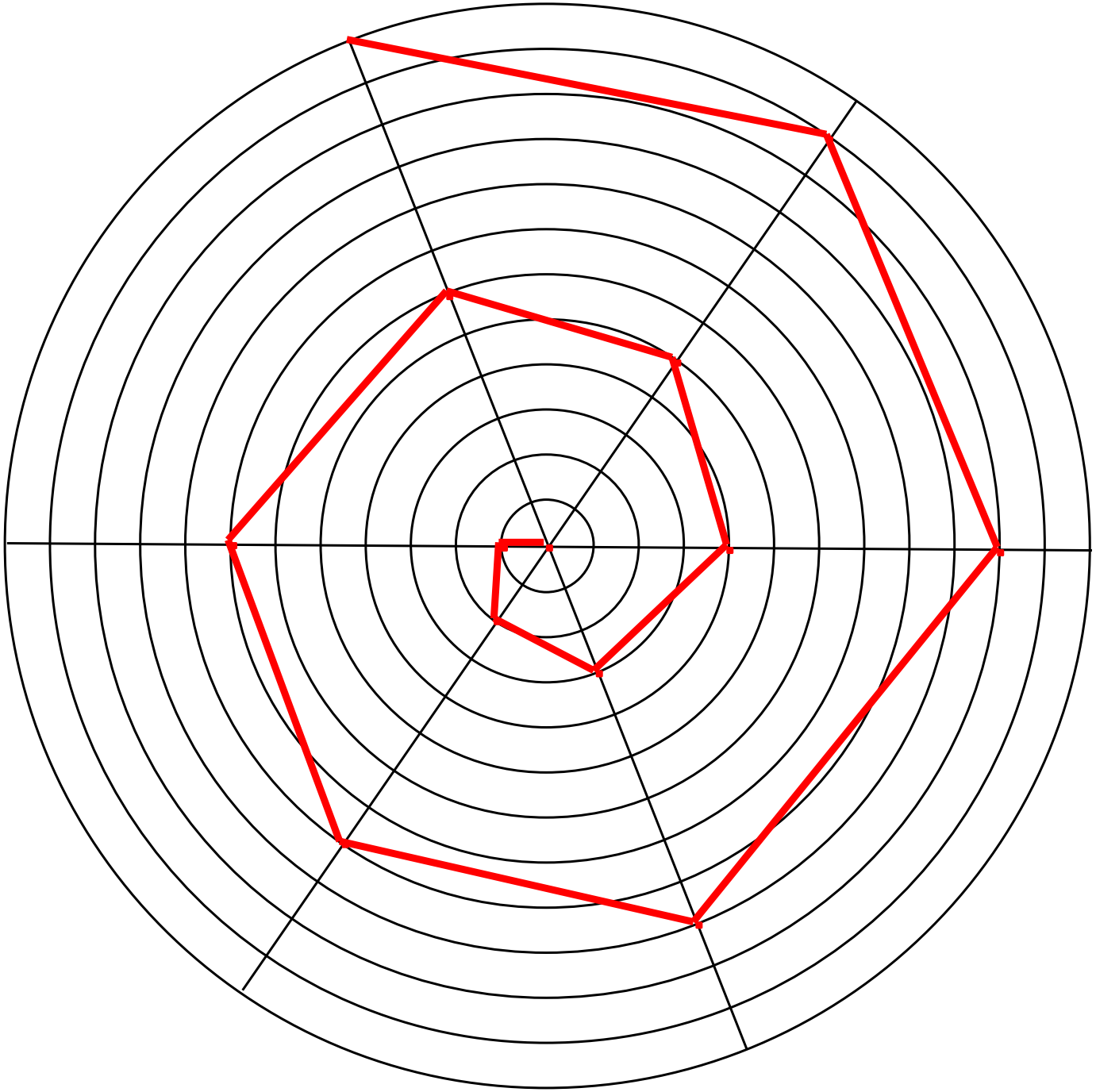
Circles that are one inside the other and have the same centre are called concentric circles.

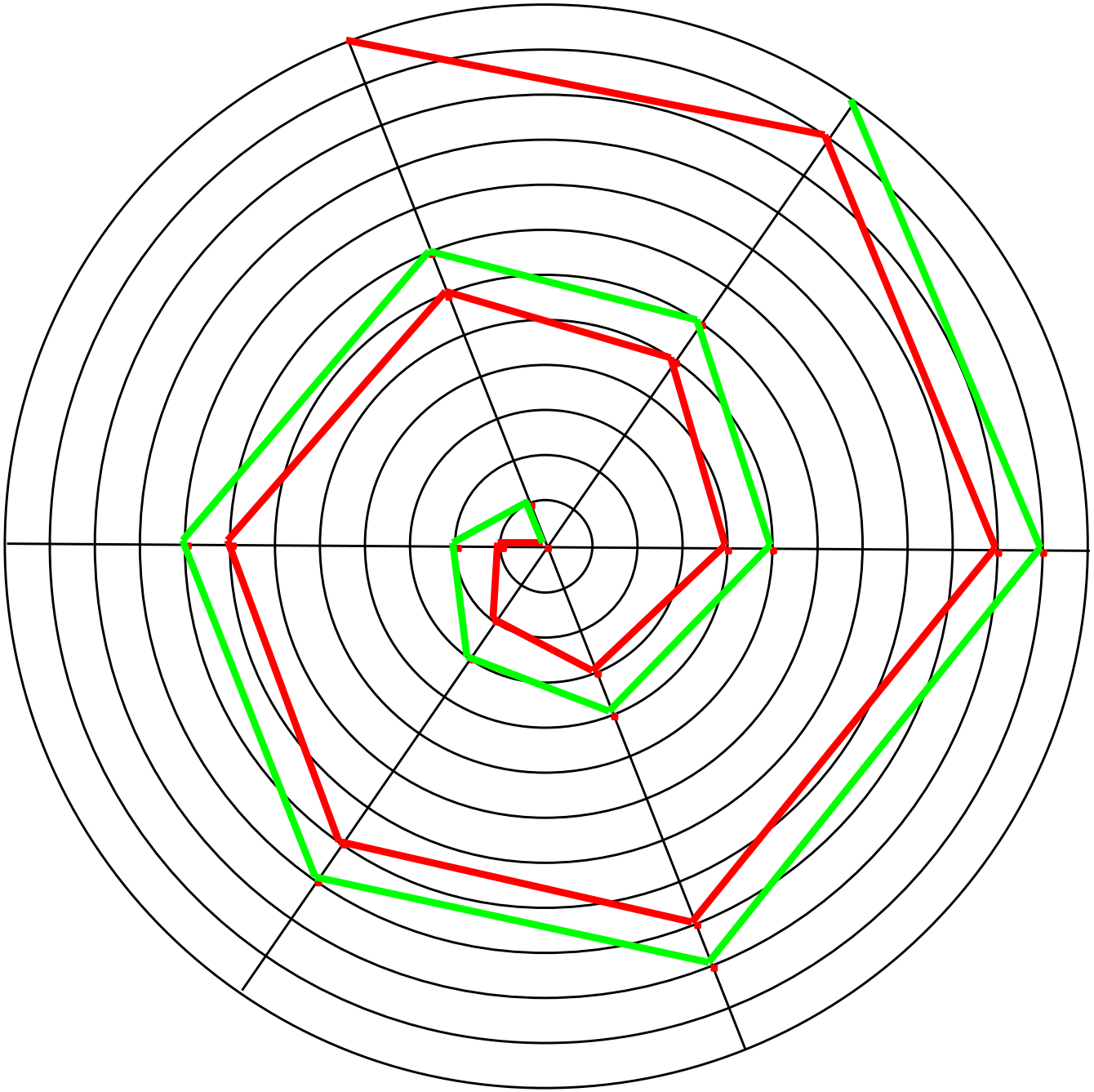


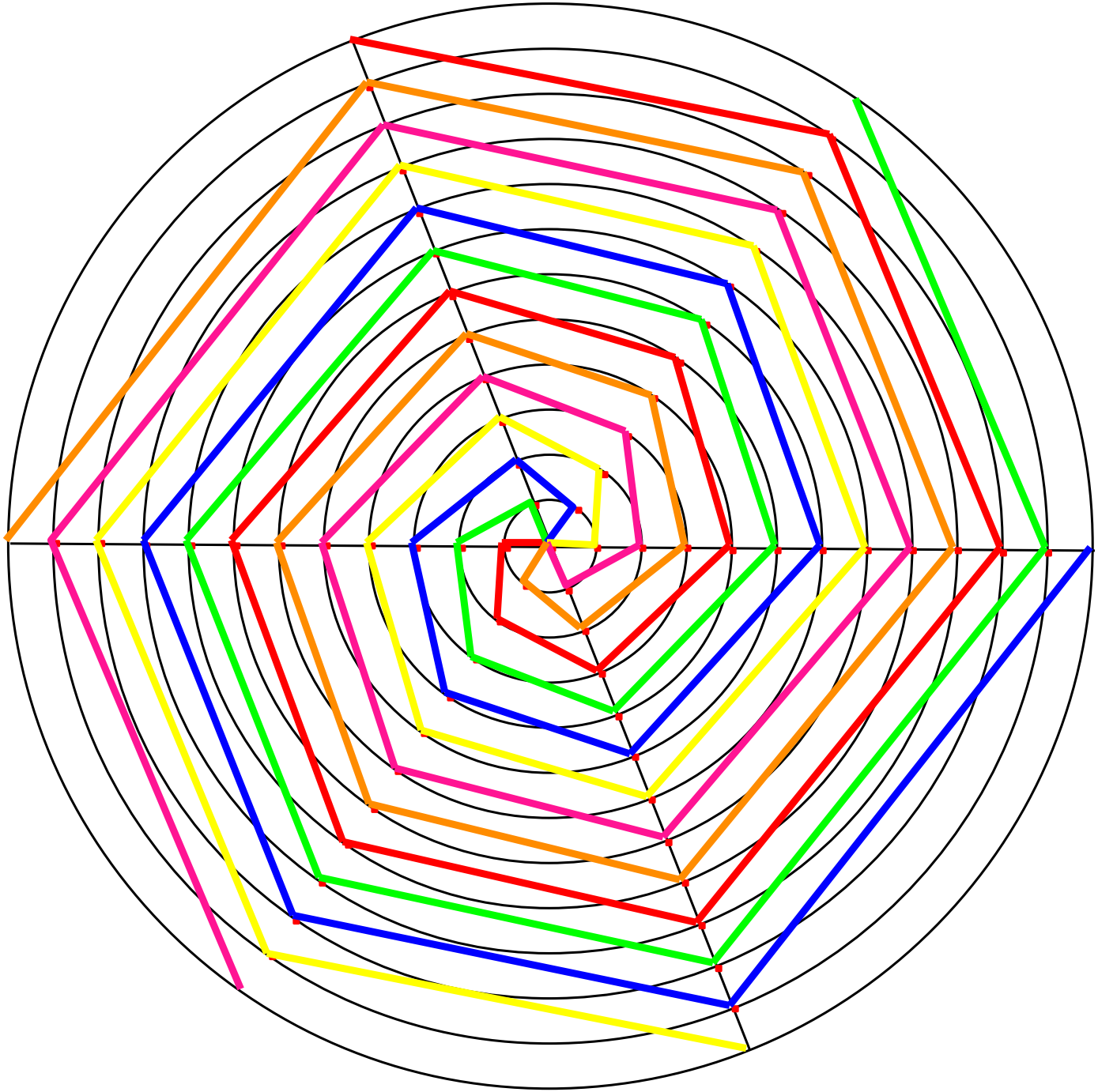


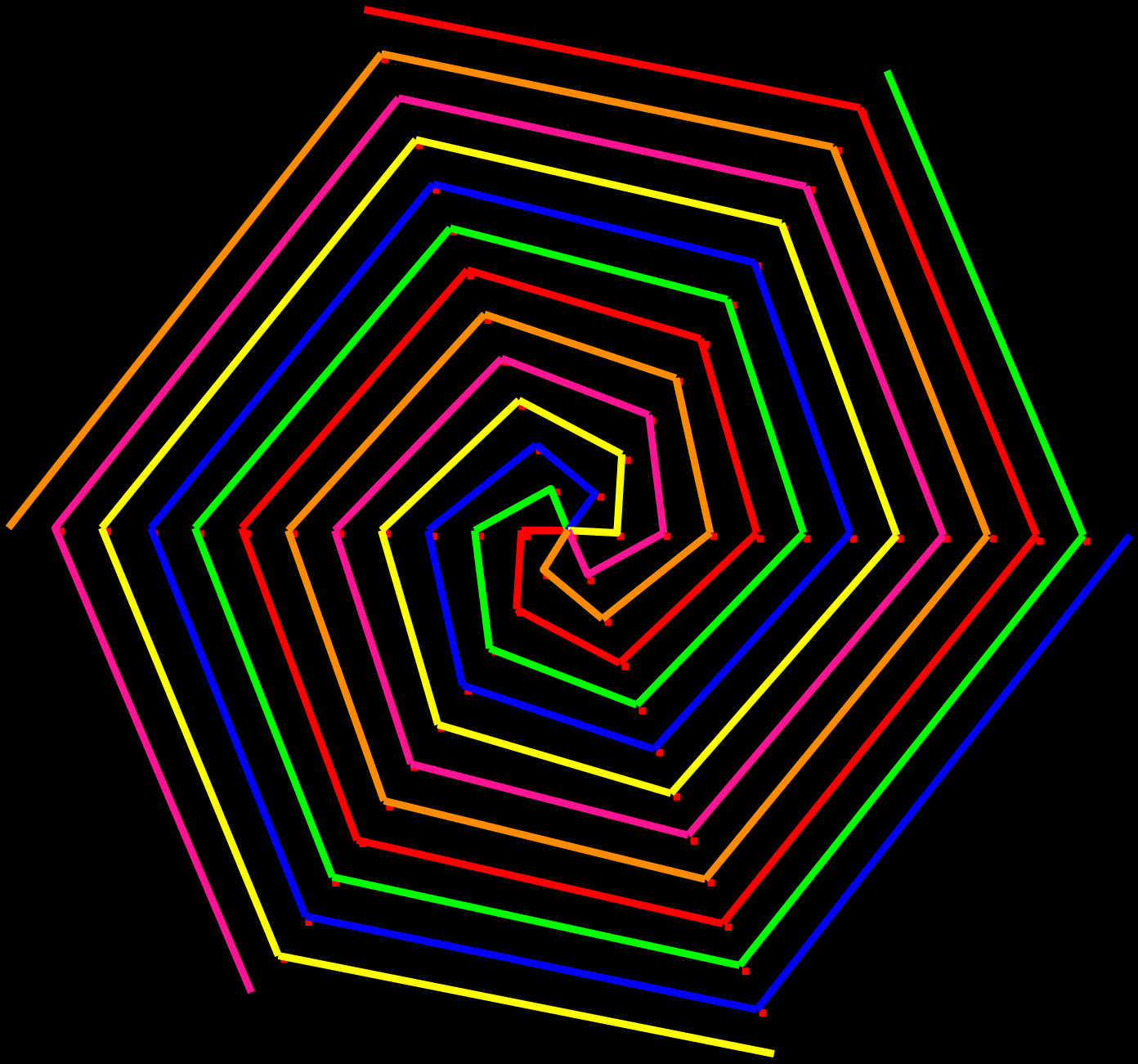


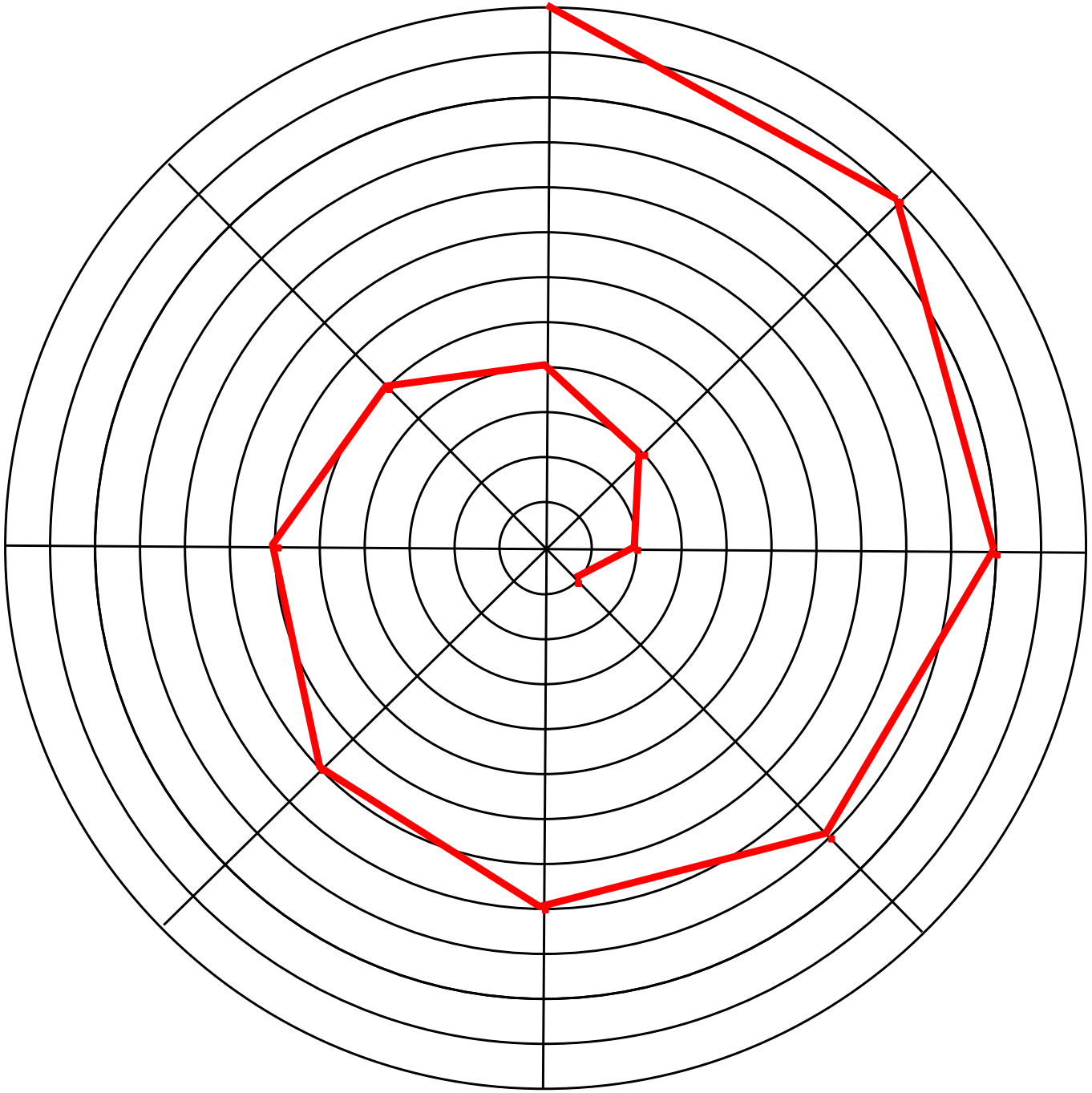


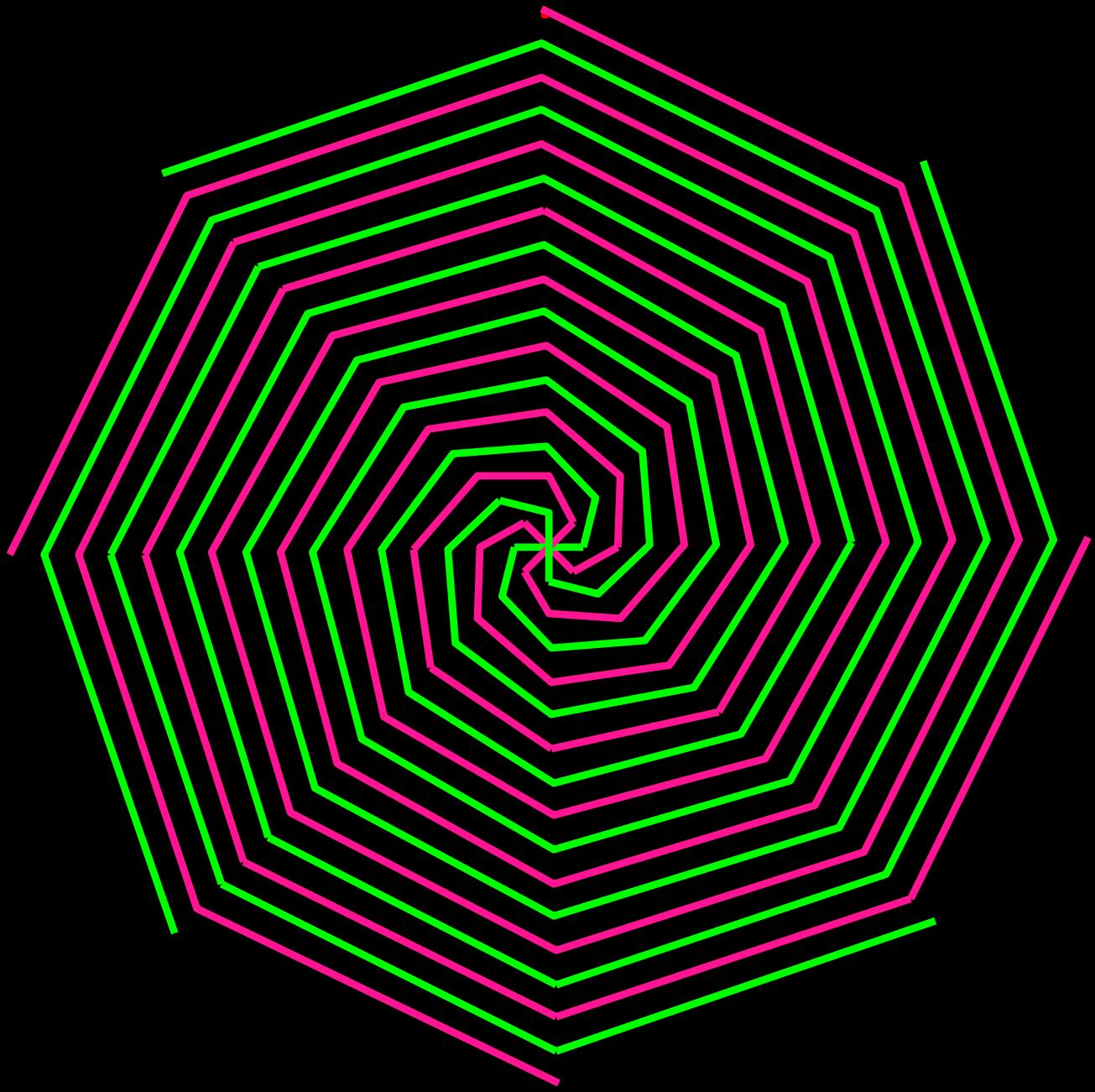


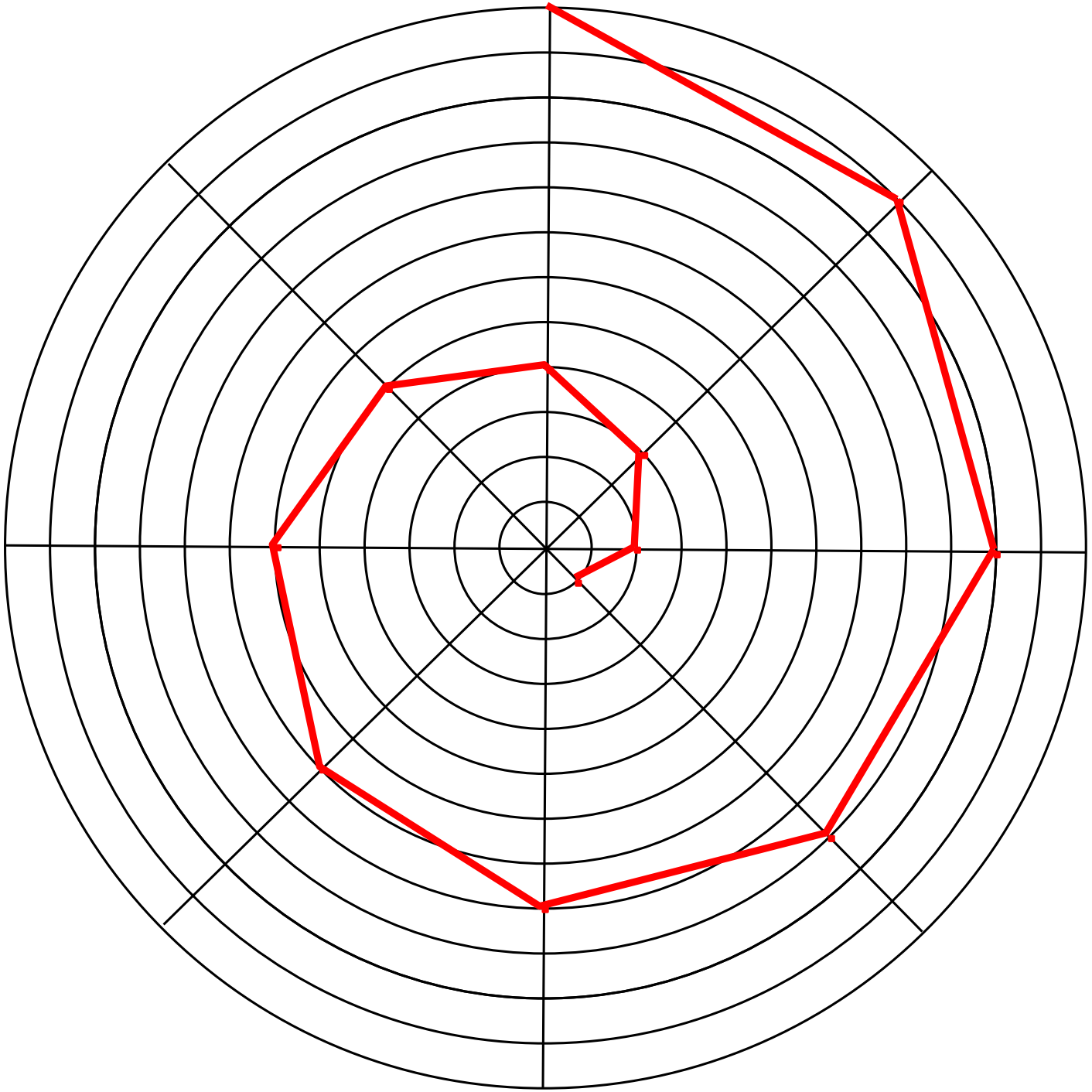


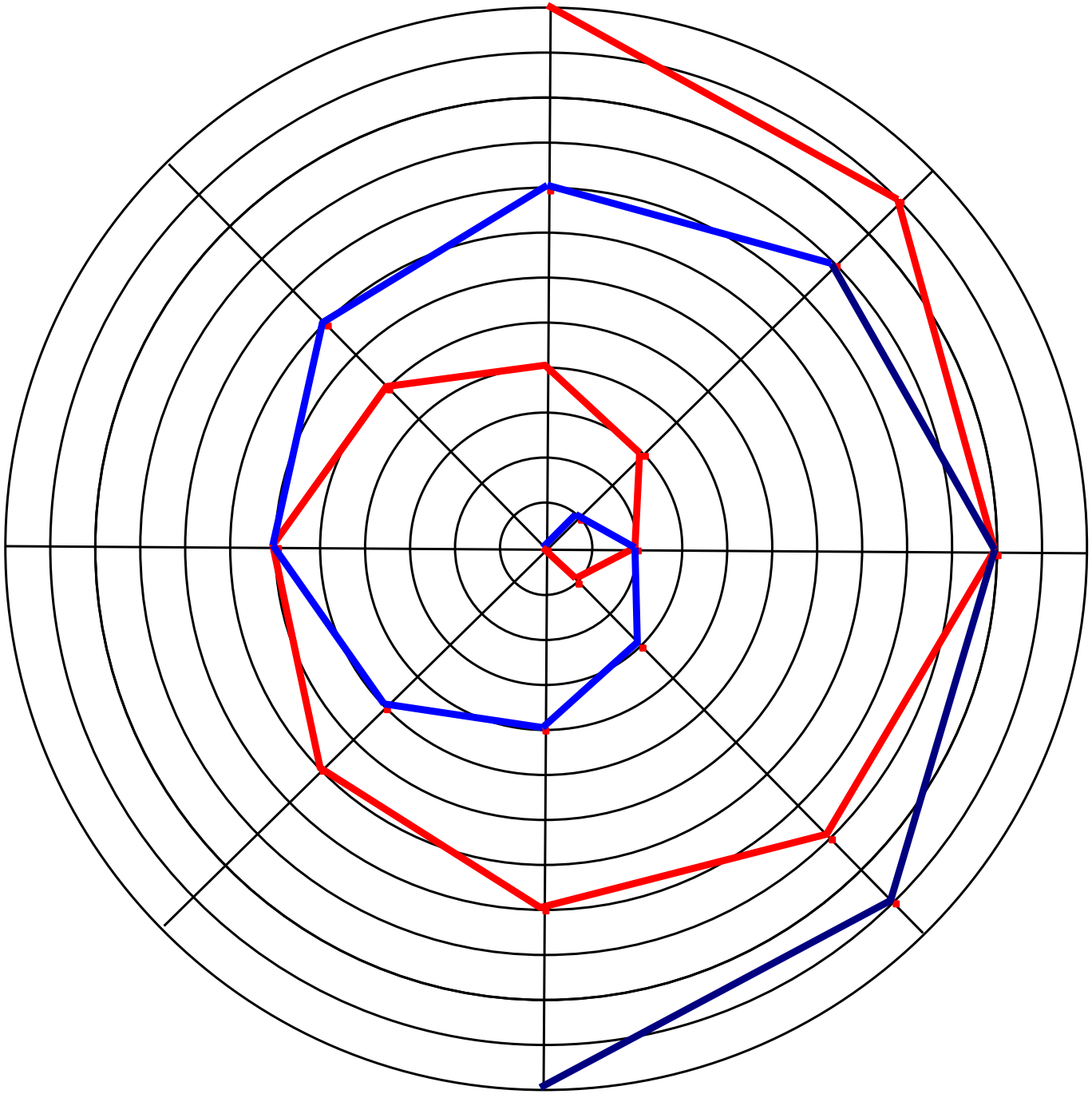


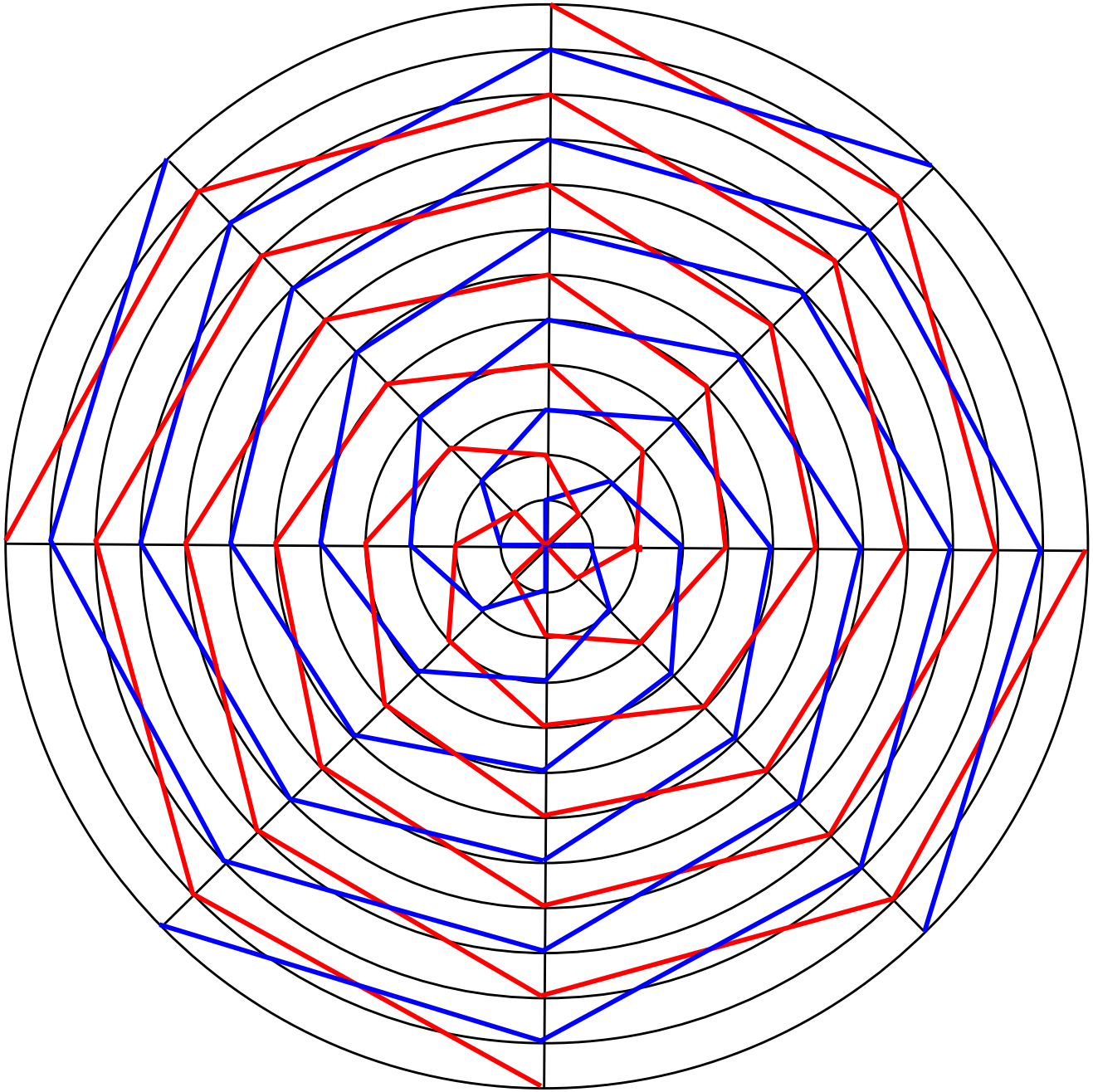


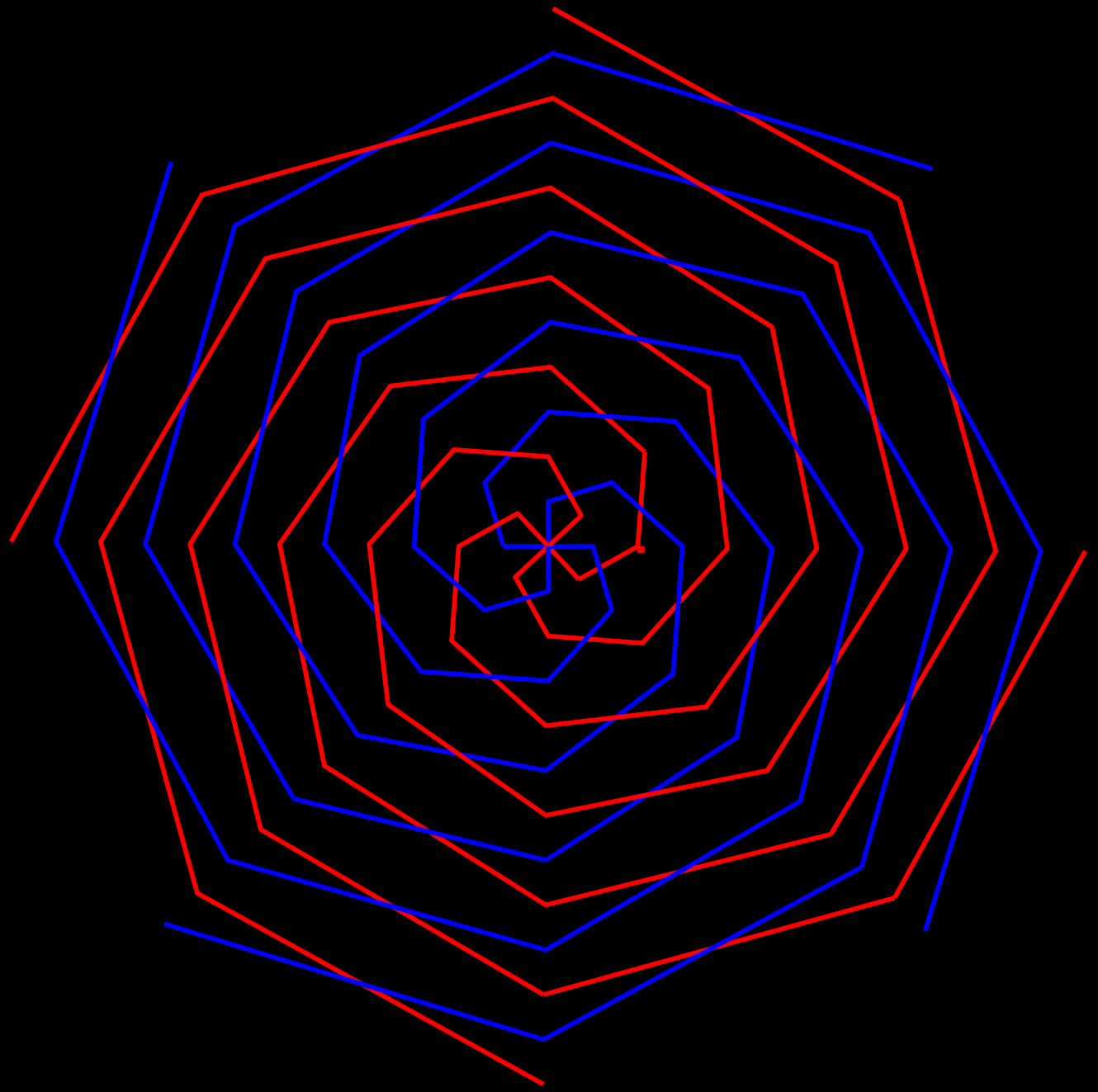


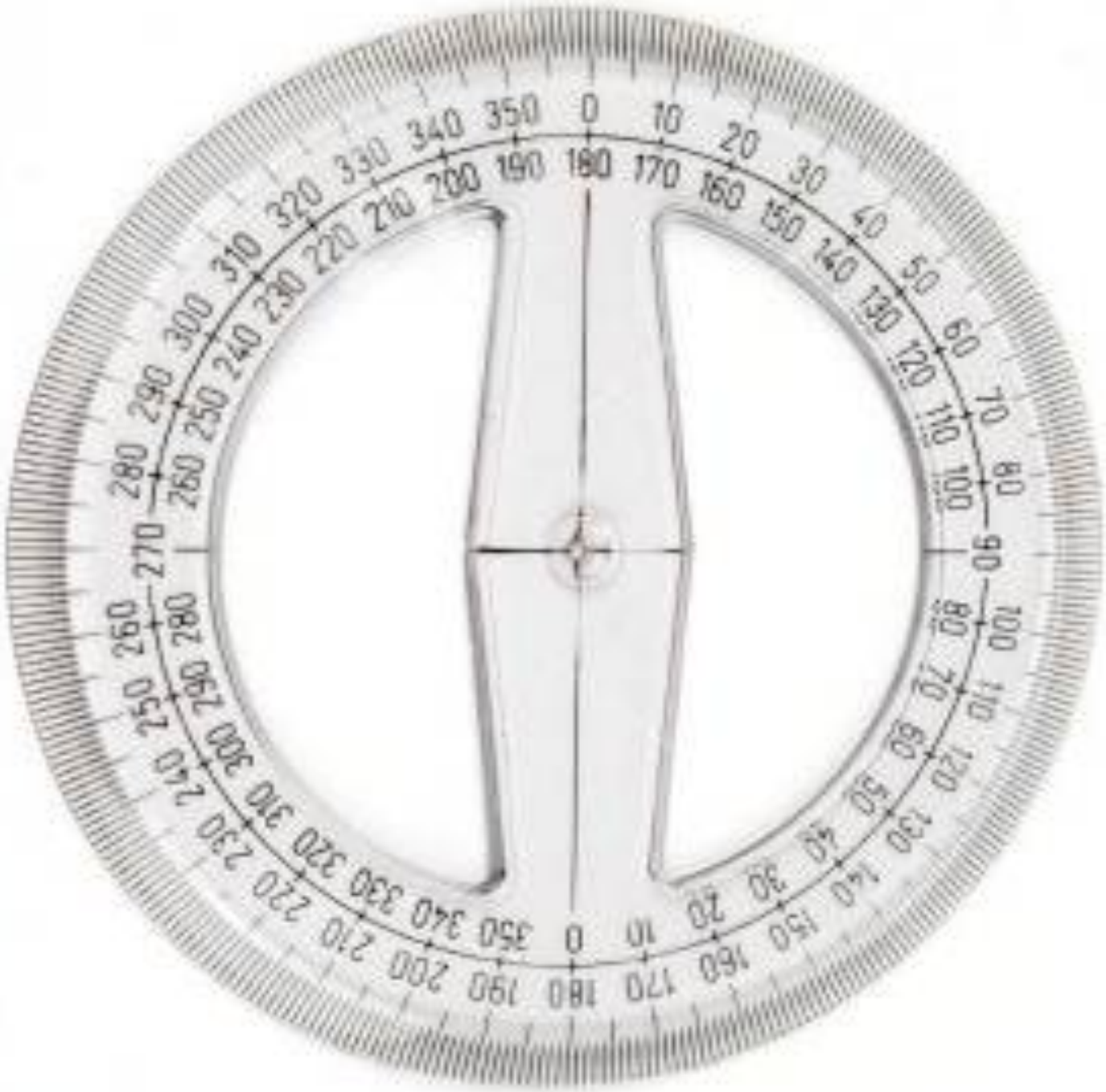








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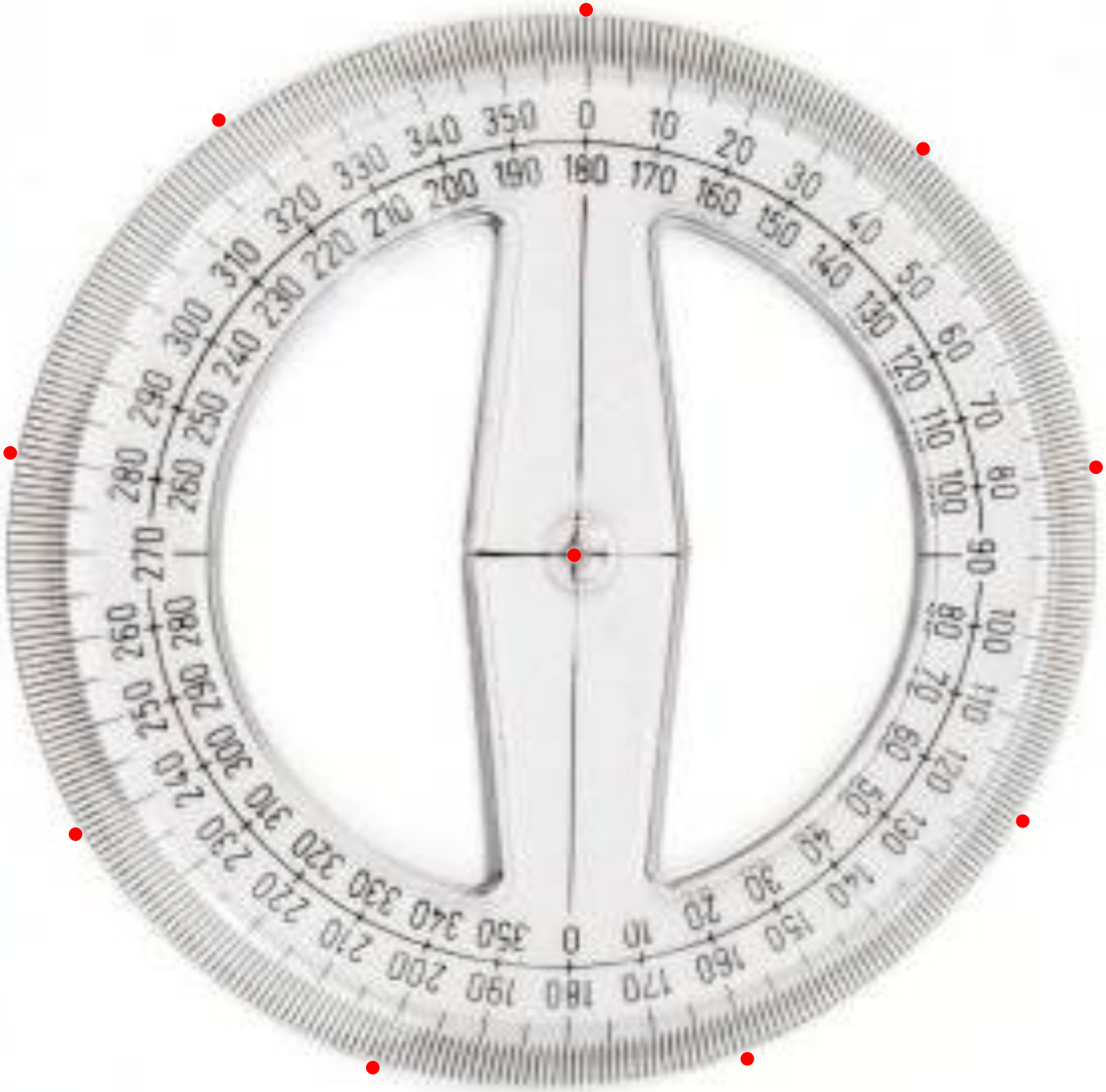
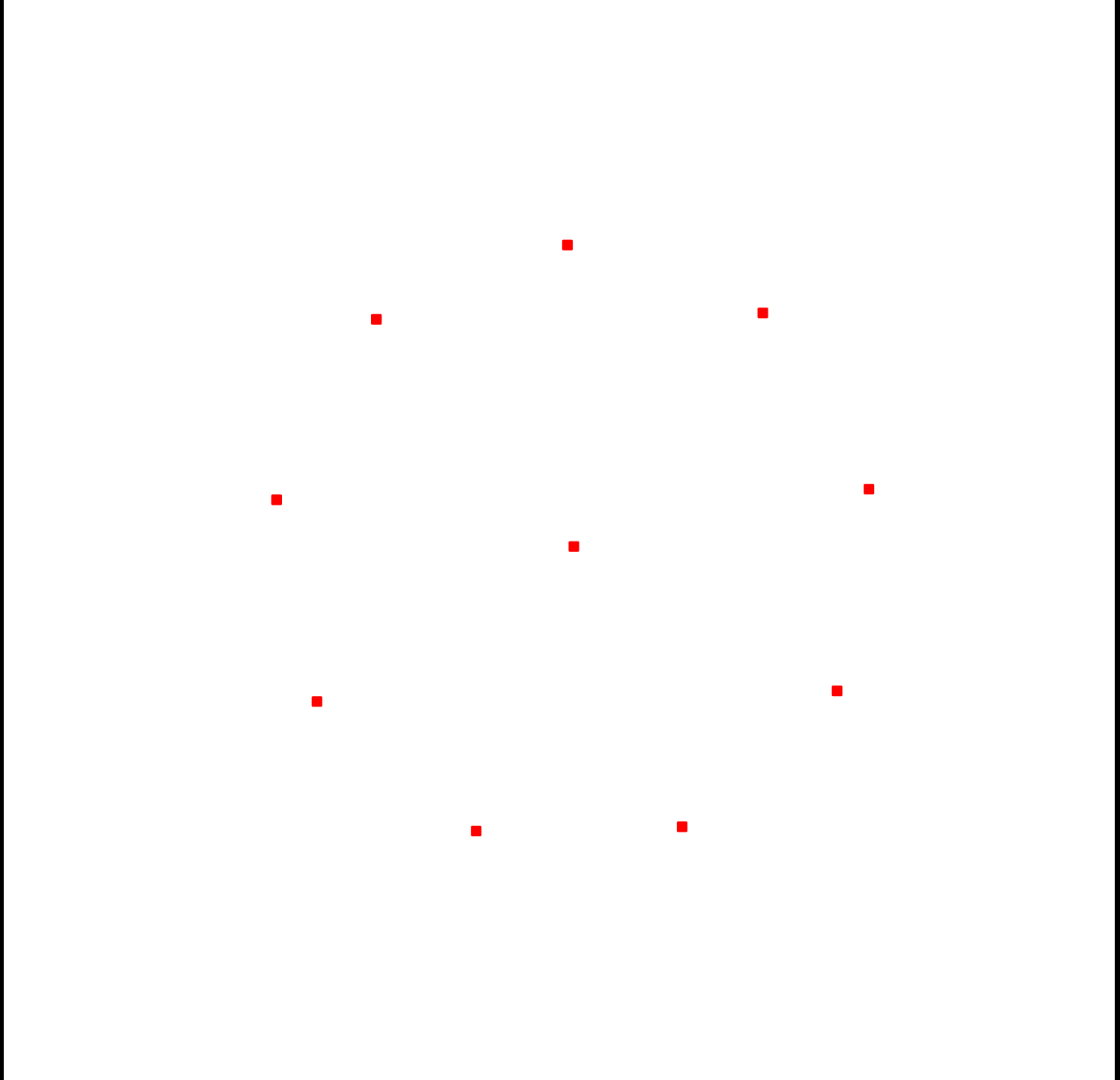
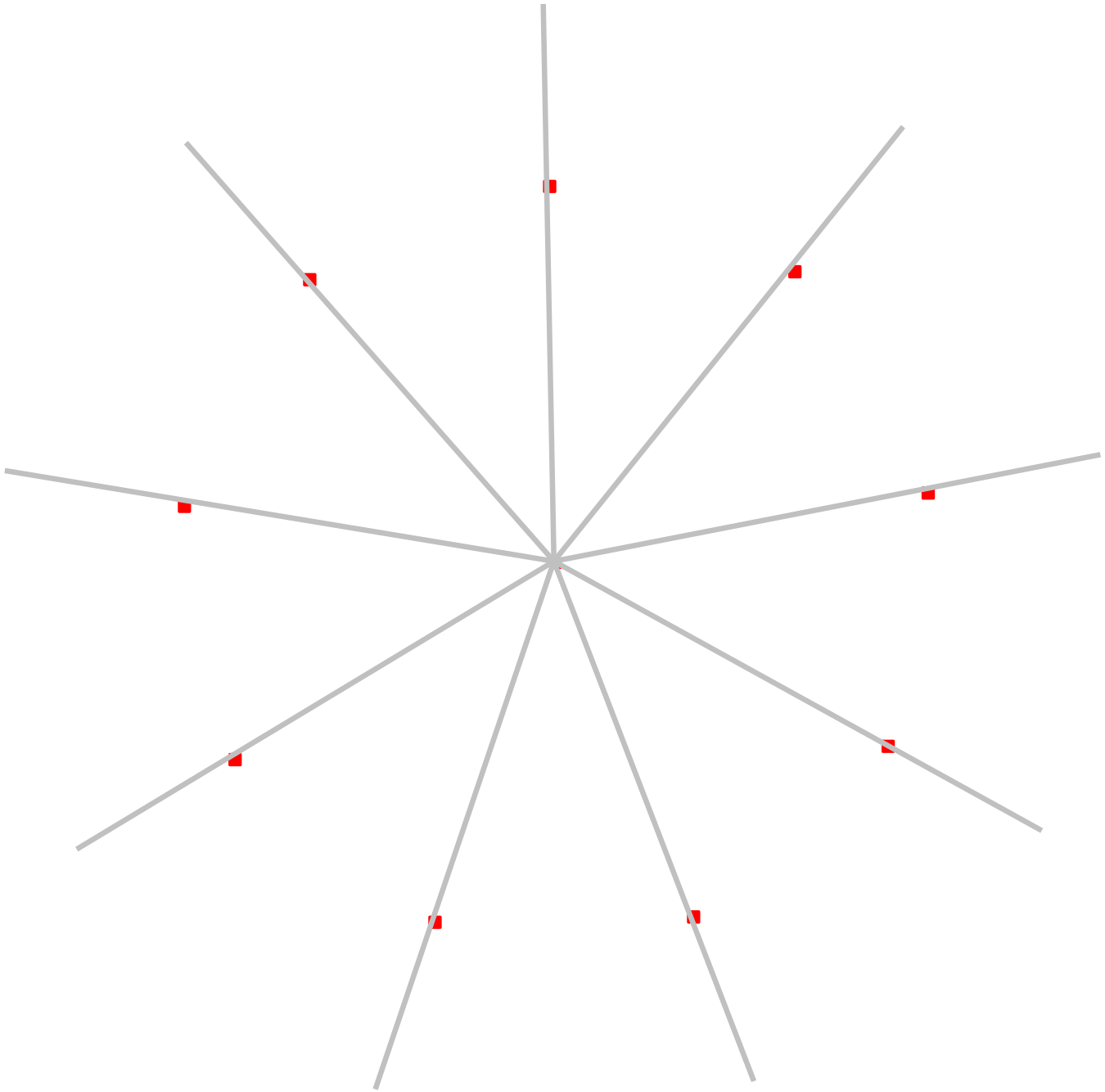
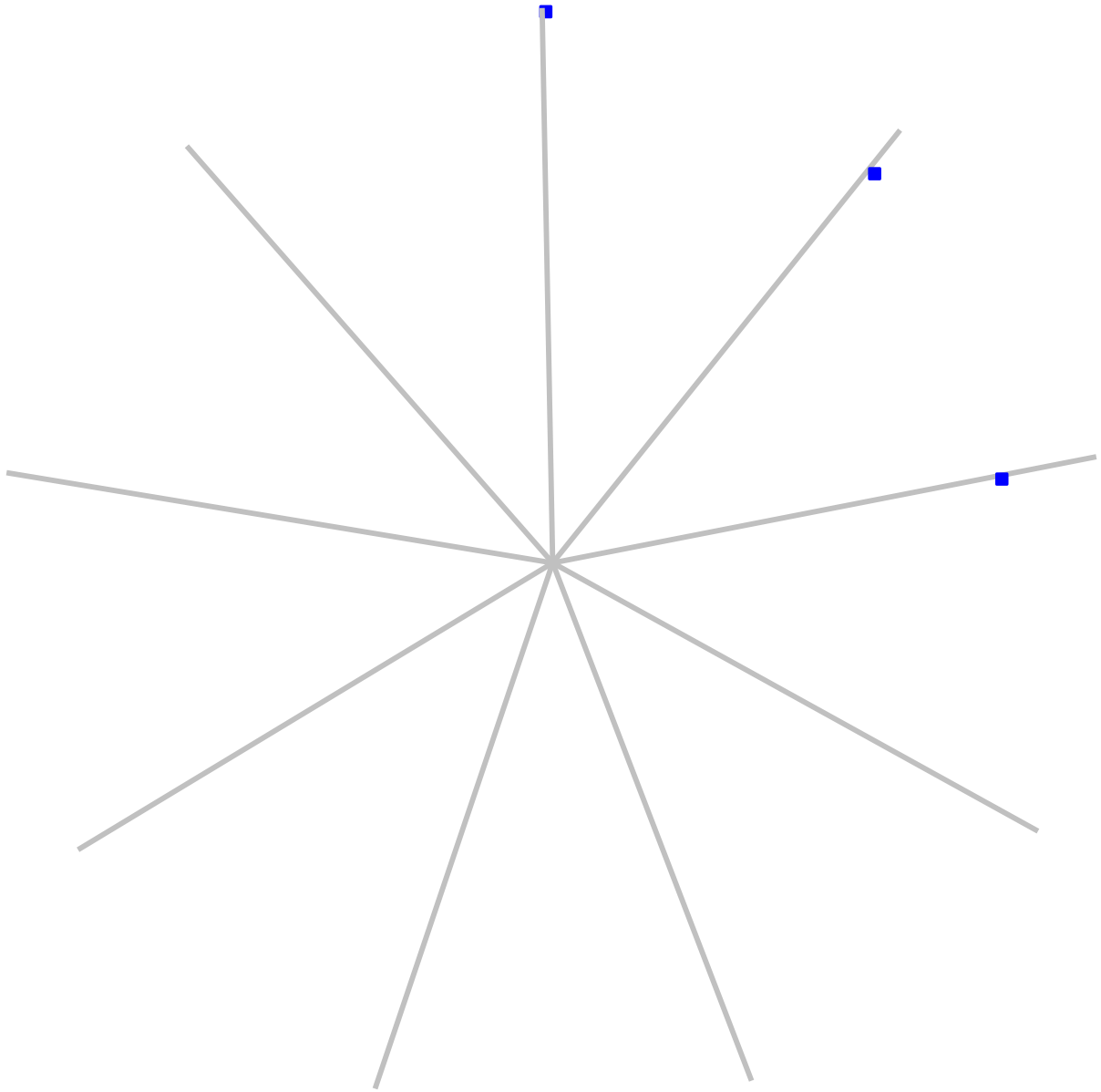
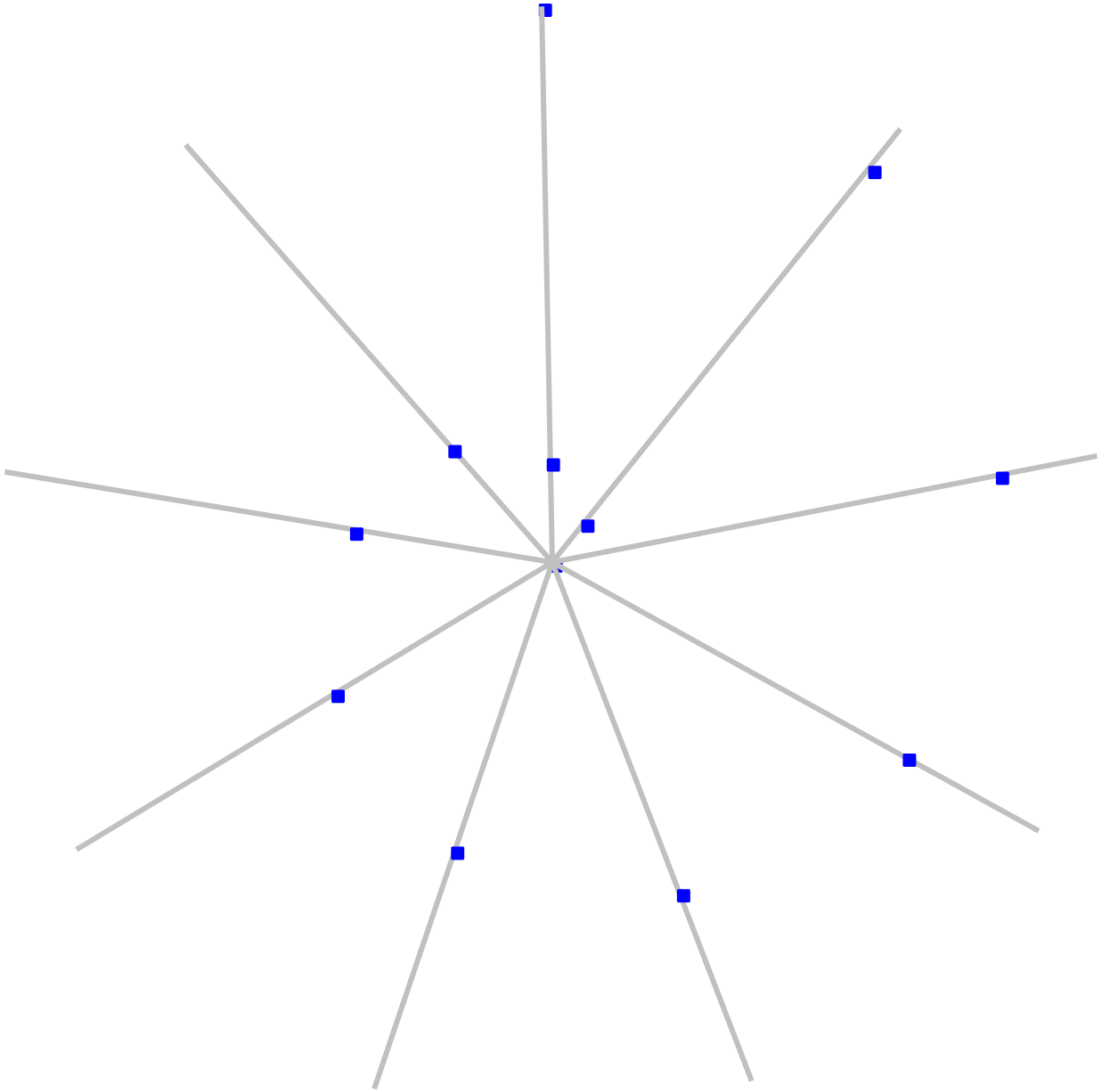
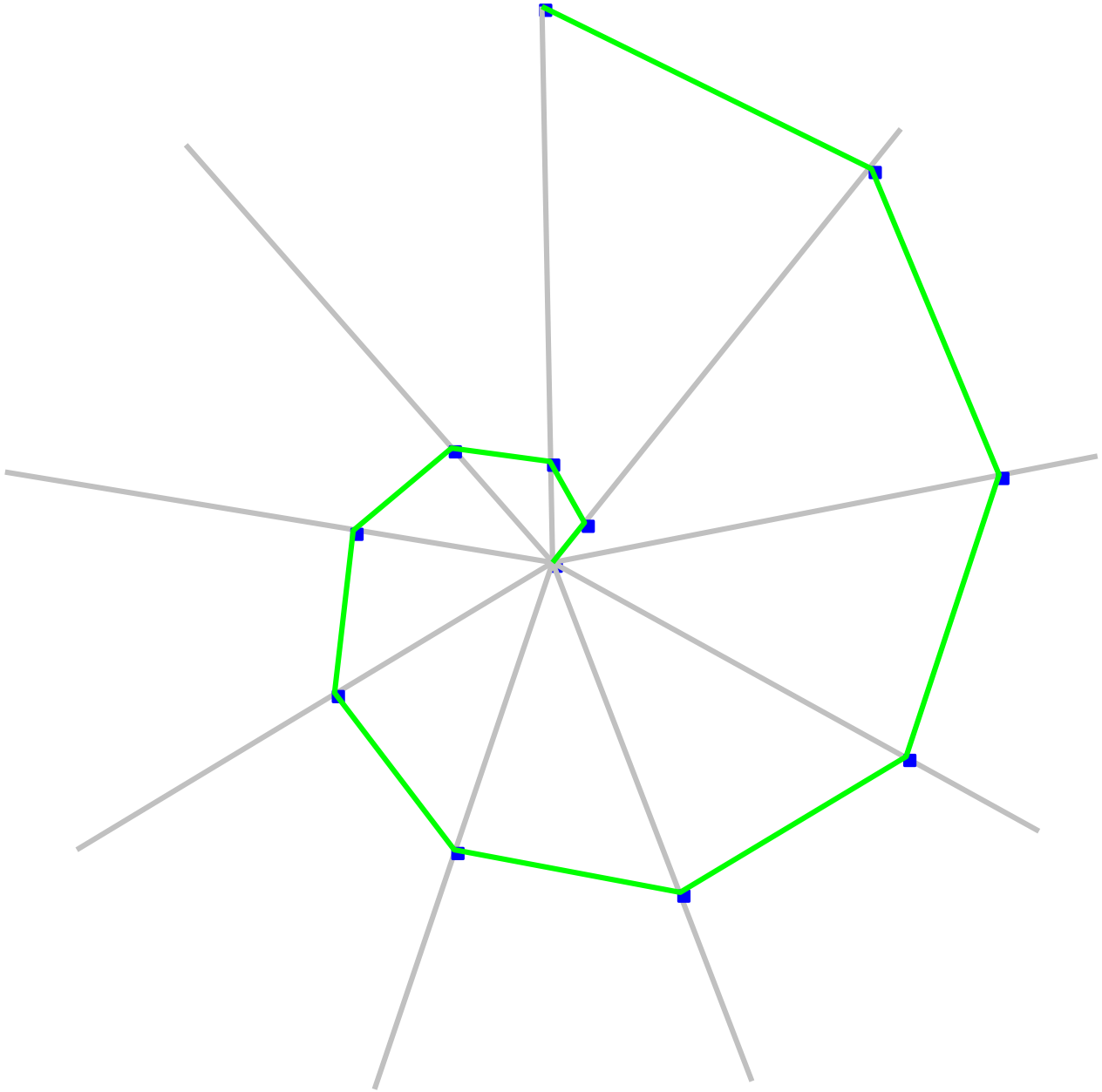


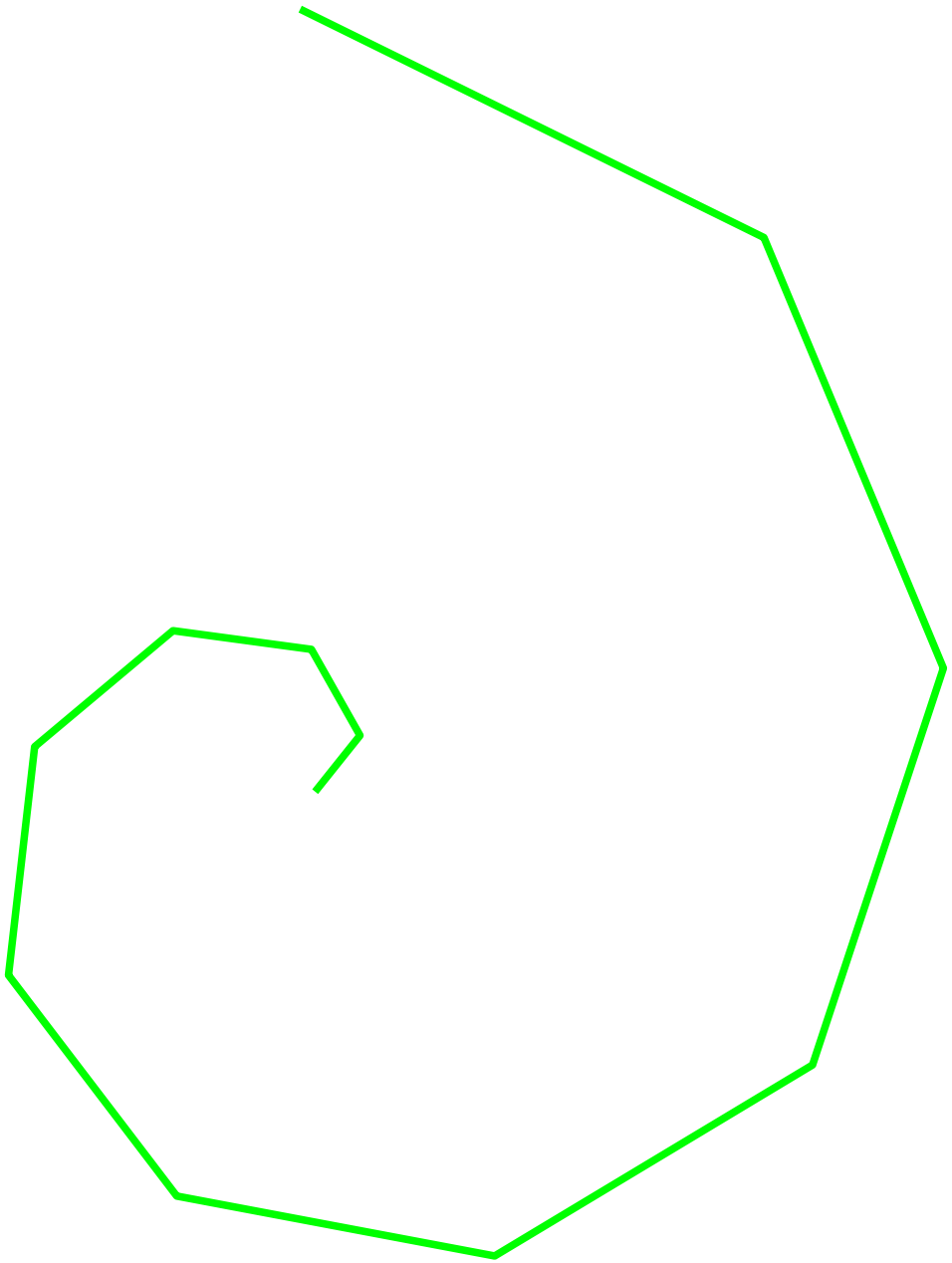






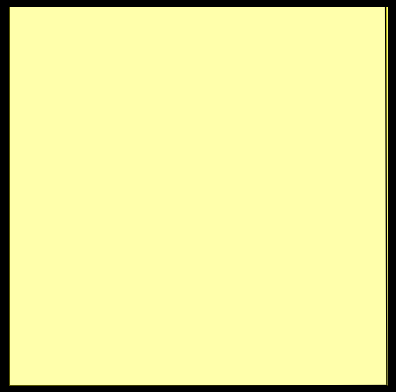




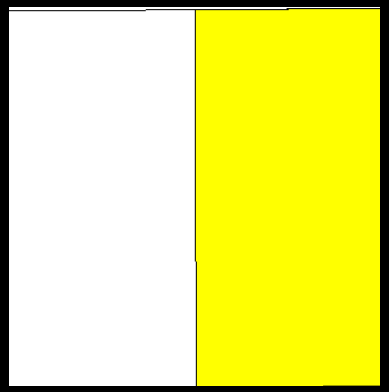



Spirals in squares

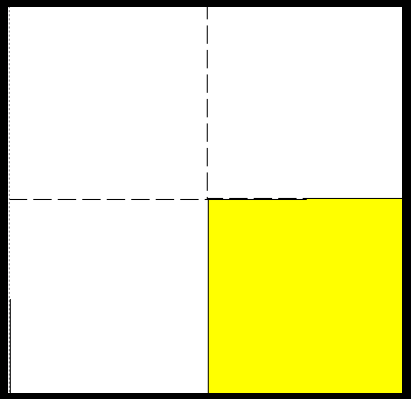
How much of the square is yellow?



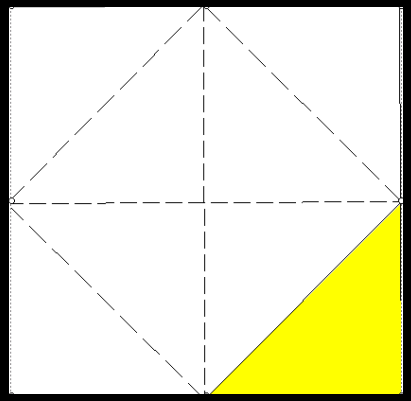
1 whole



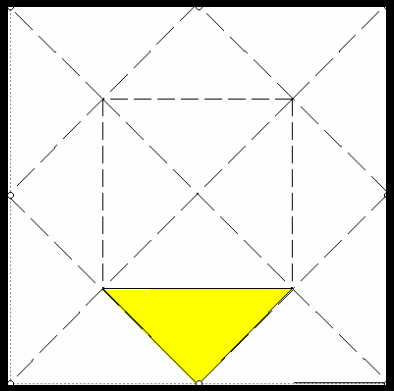
$\frac{1}{2}$



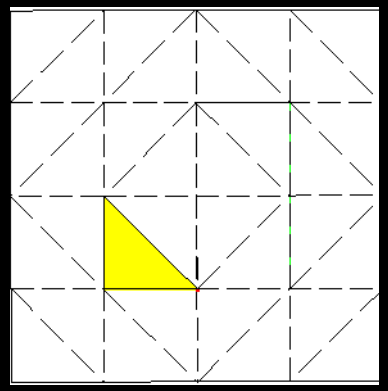
$\frac{1}{4}$



$\frac{1}{8}$



$\frac{1}{16}$

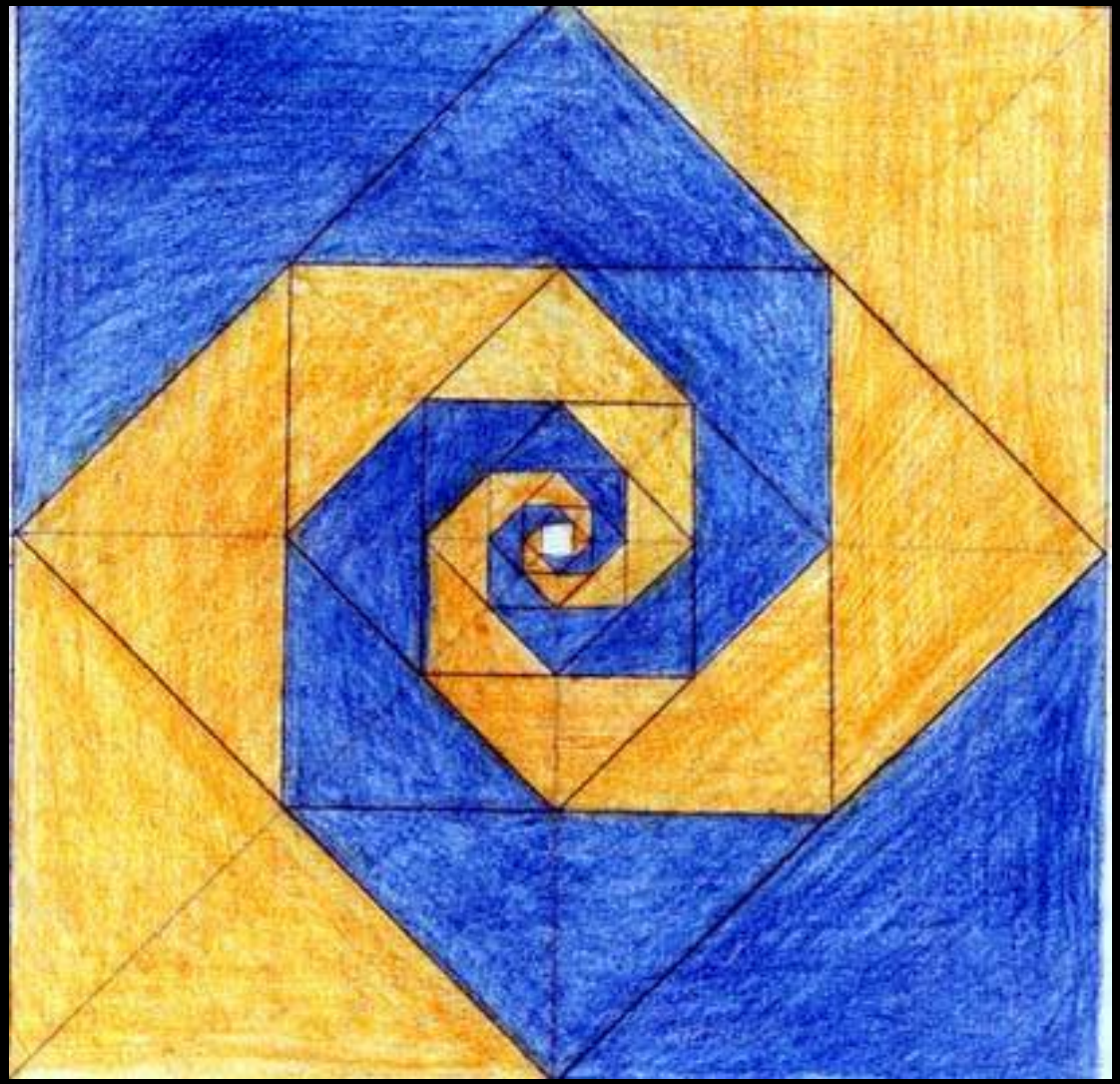


$\frac{1}{32}$

Copy these numbers and continue the pattern.

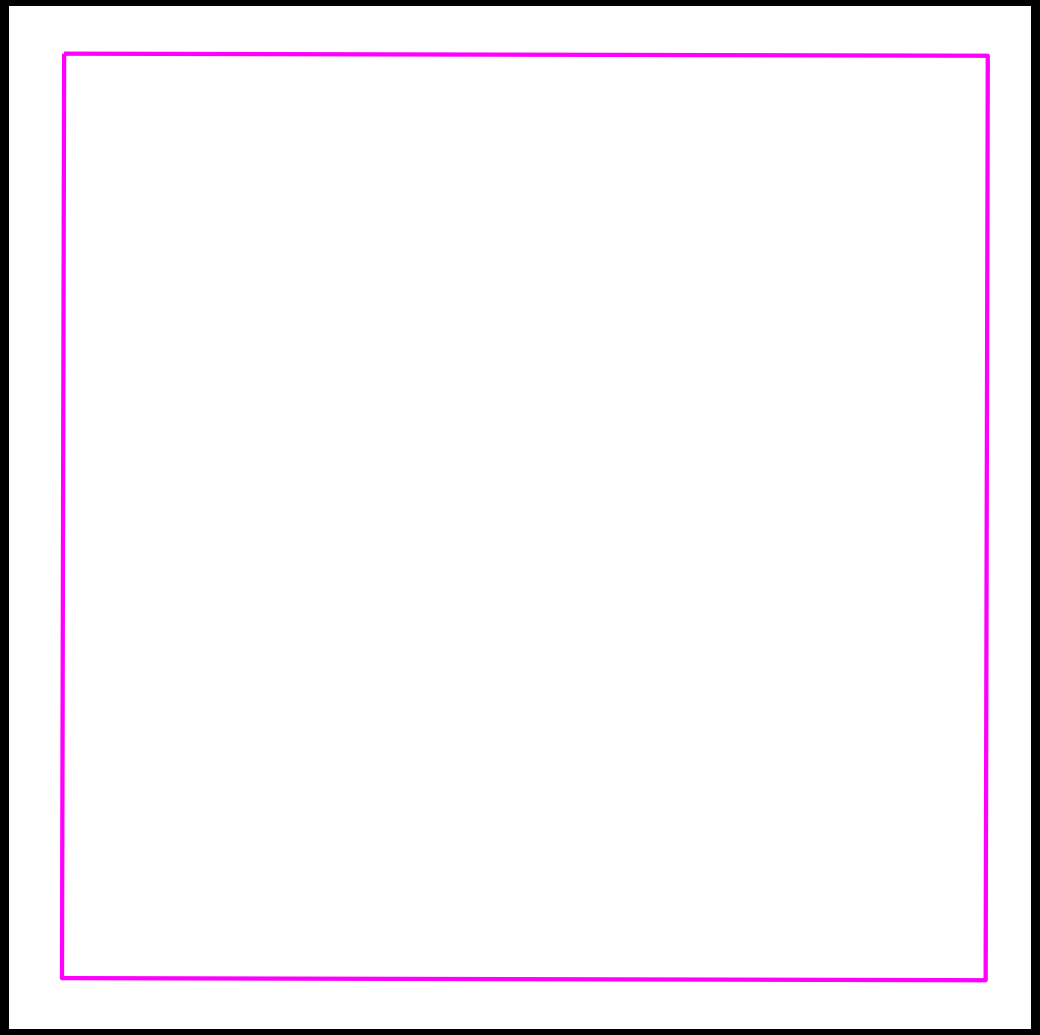
$$1 \quad \frac{1}{2} \quad \frac{1}{4} \quad \frac{1}{8} \quad \frac{1}{16} \quad \frac{1}{32} \quad \frac{1}{64} \quad \frac{1}{128} \quad \frac{1}{256}$$

Write down a rule that explains how to find the next number.



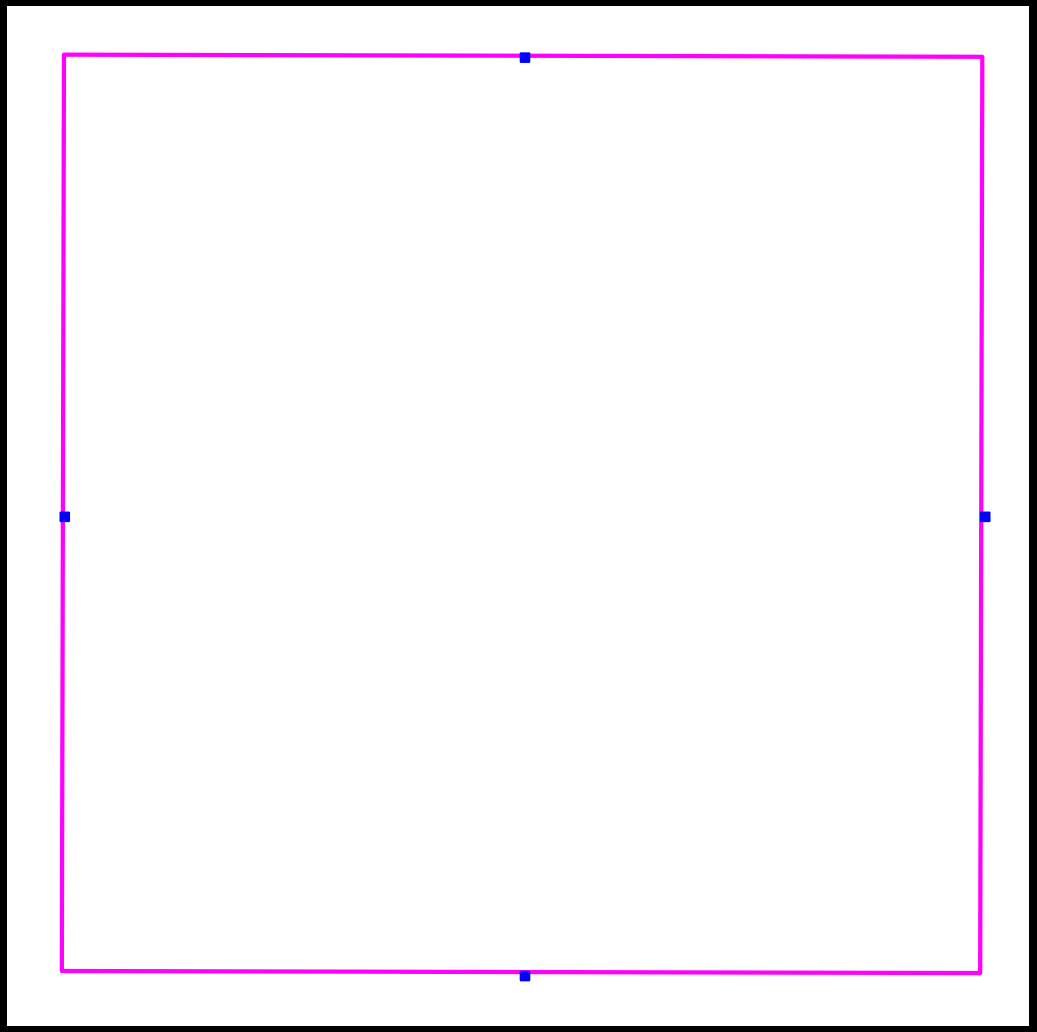
These spirals are called Baravelle spirals.

Baravelle spirals are made with triangles

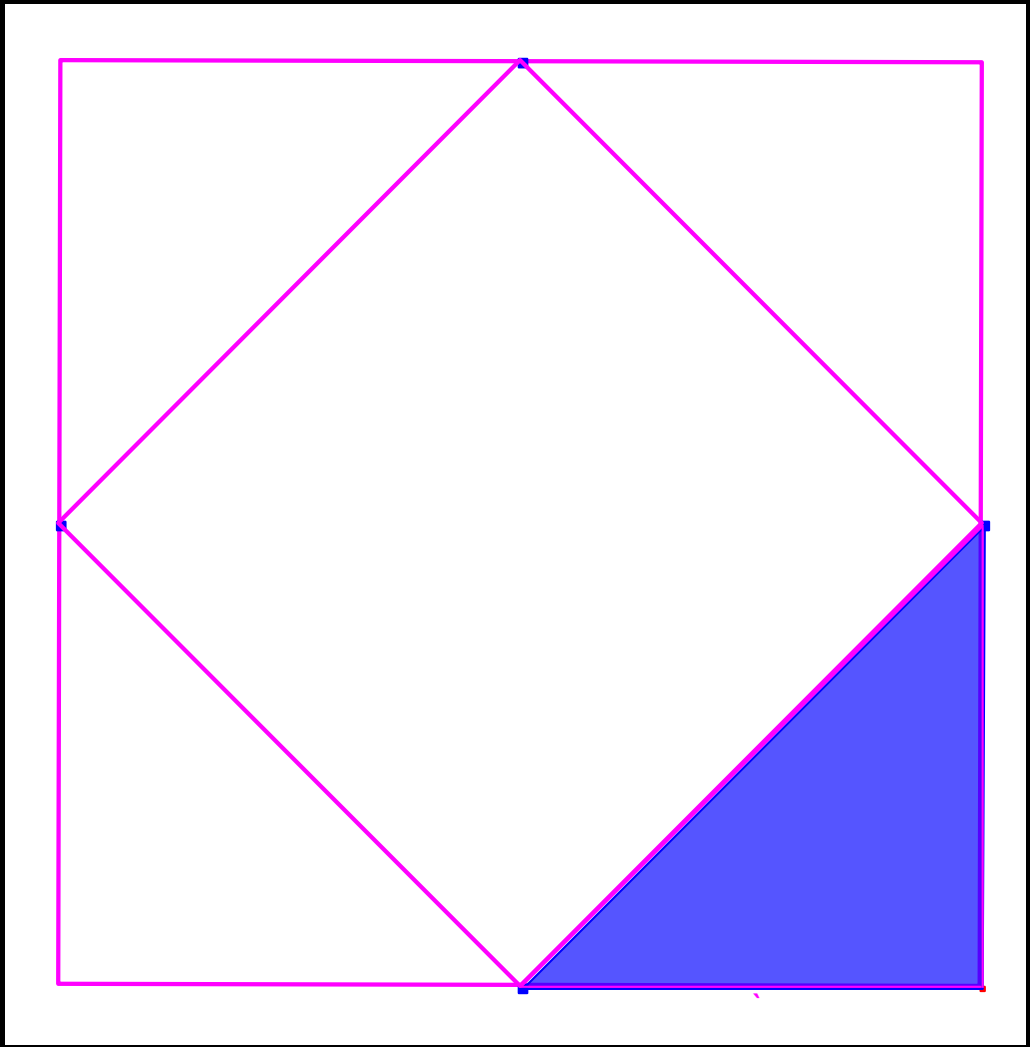


Draw a square with sides 16 cm long?

What is the area of the square?

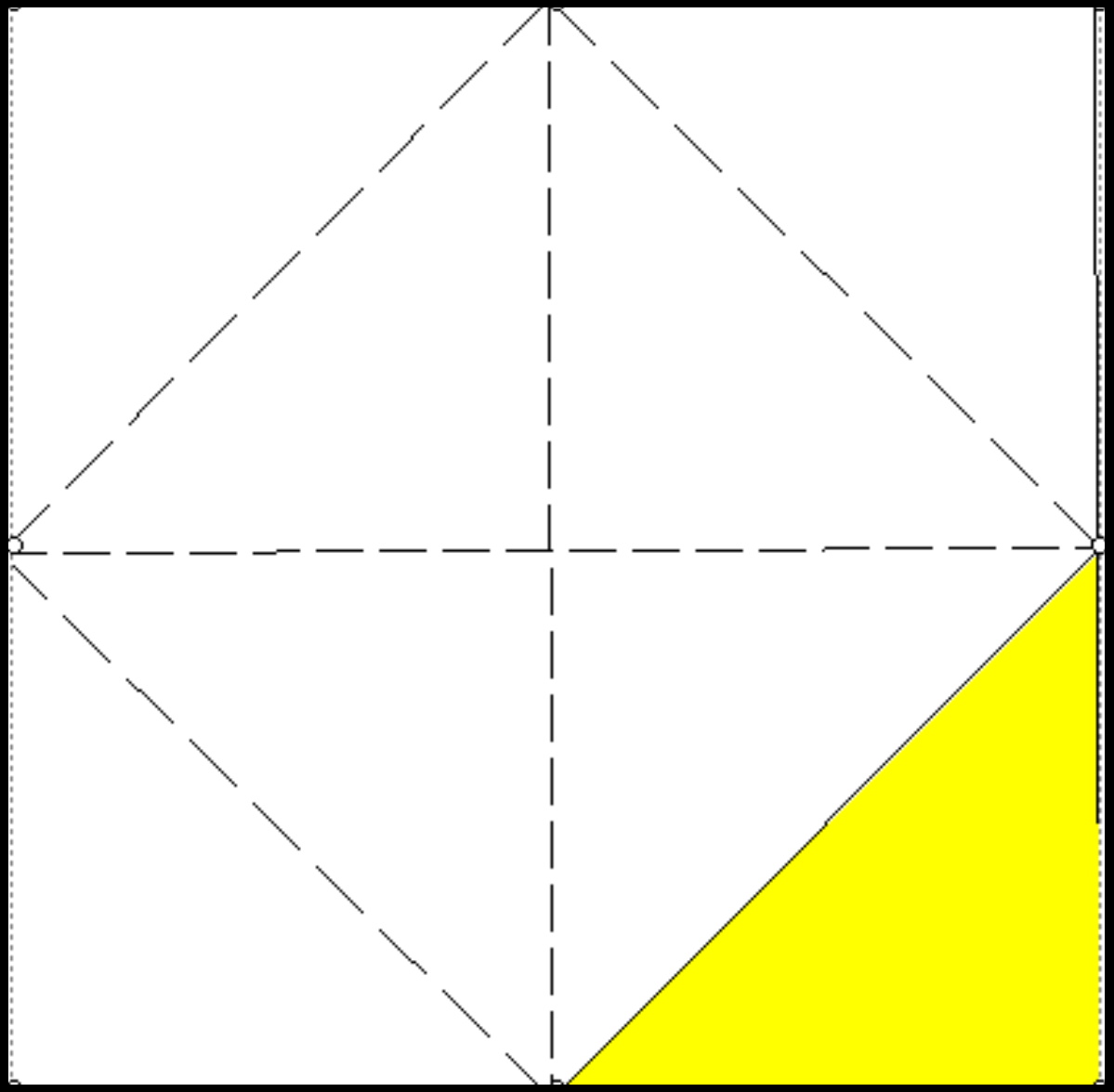


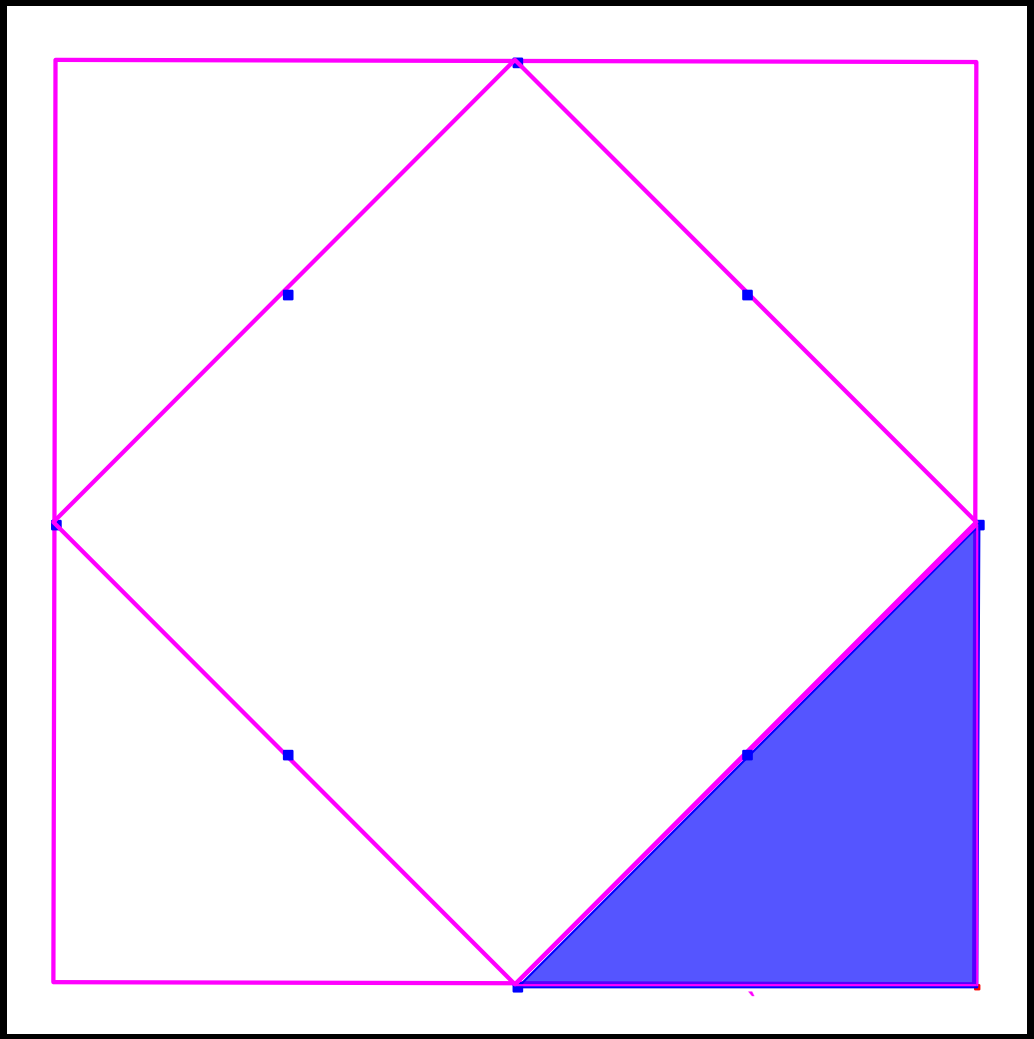
Mark the midpoint of each side of the square



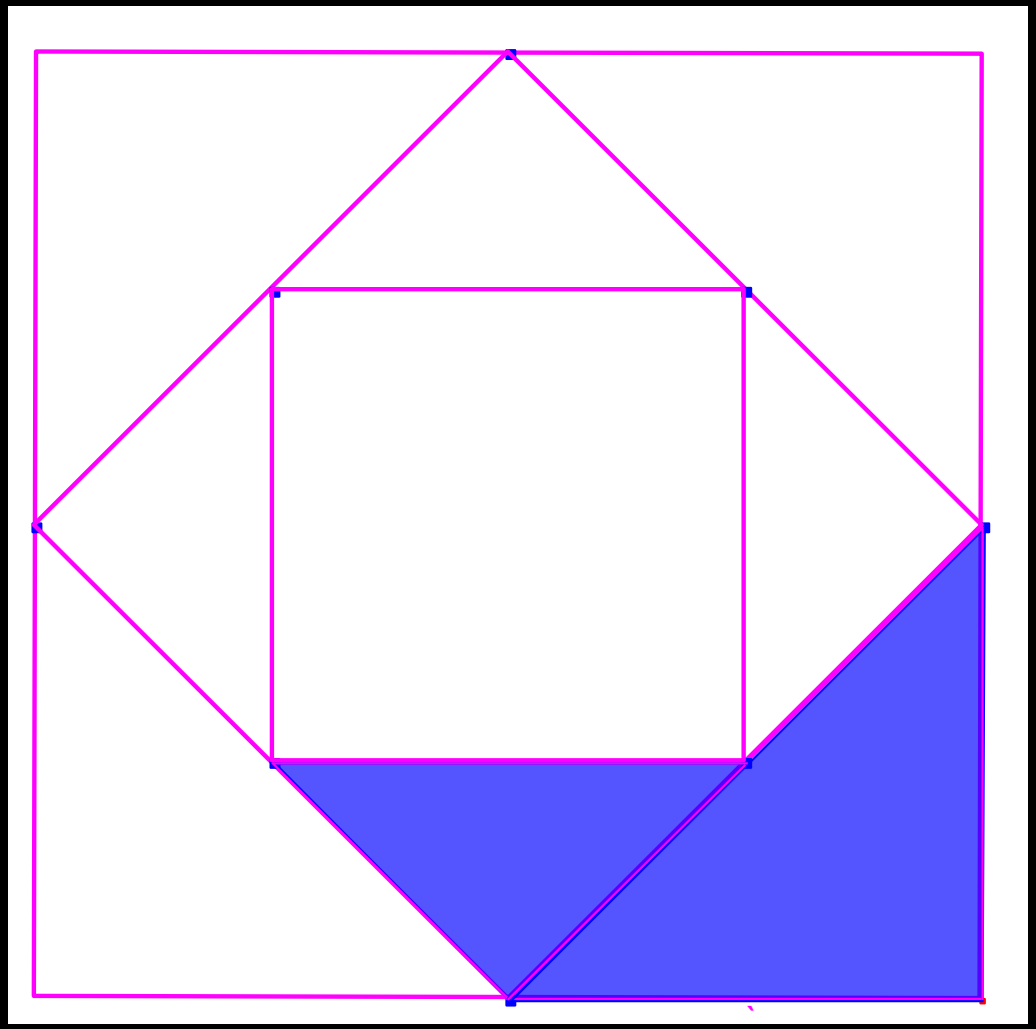
Joint the midpoints to make a new square

Colour the bottom right triangle.

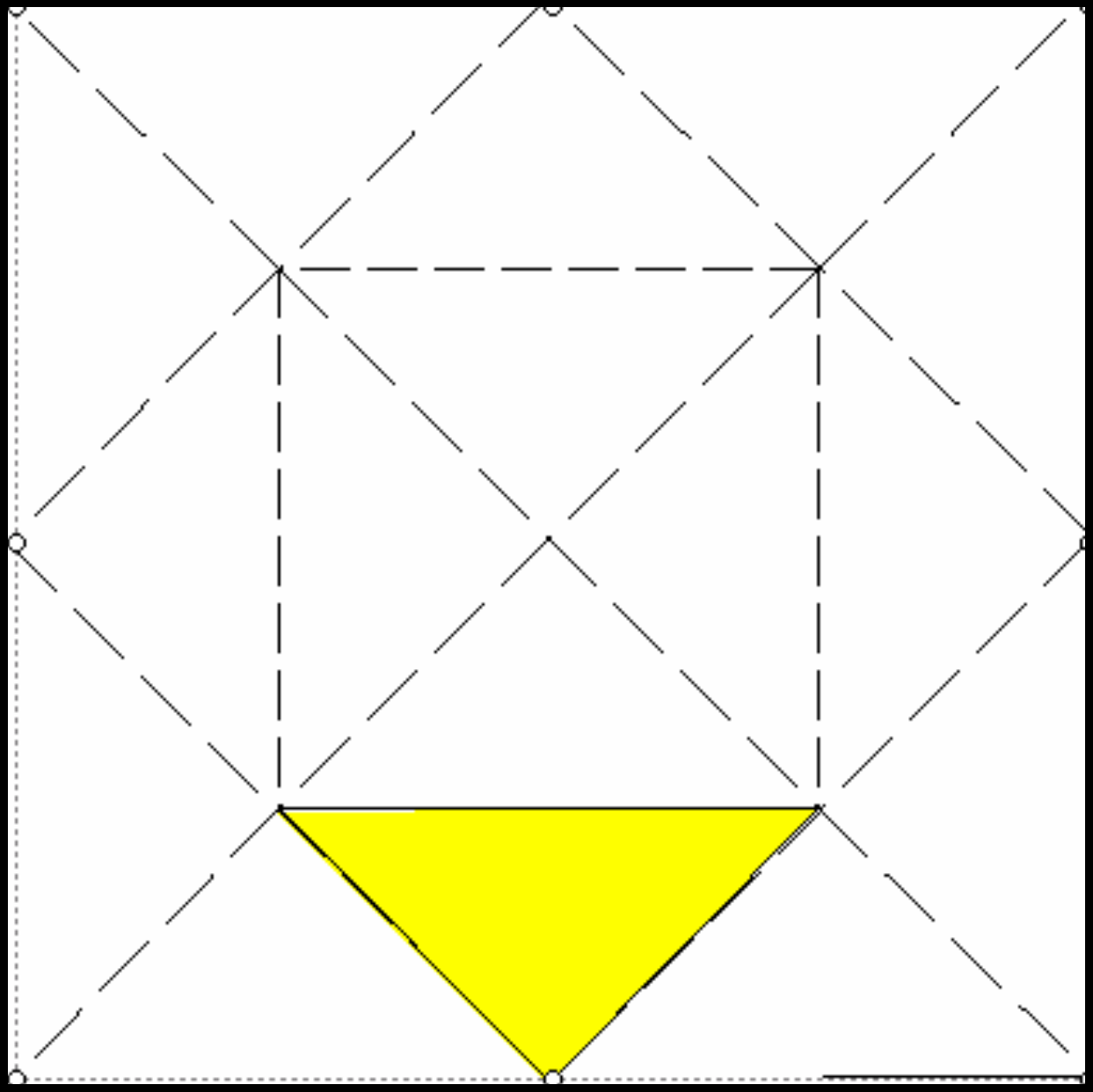


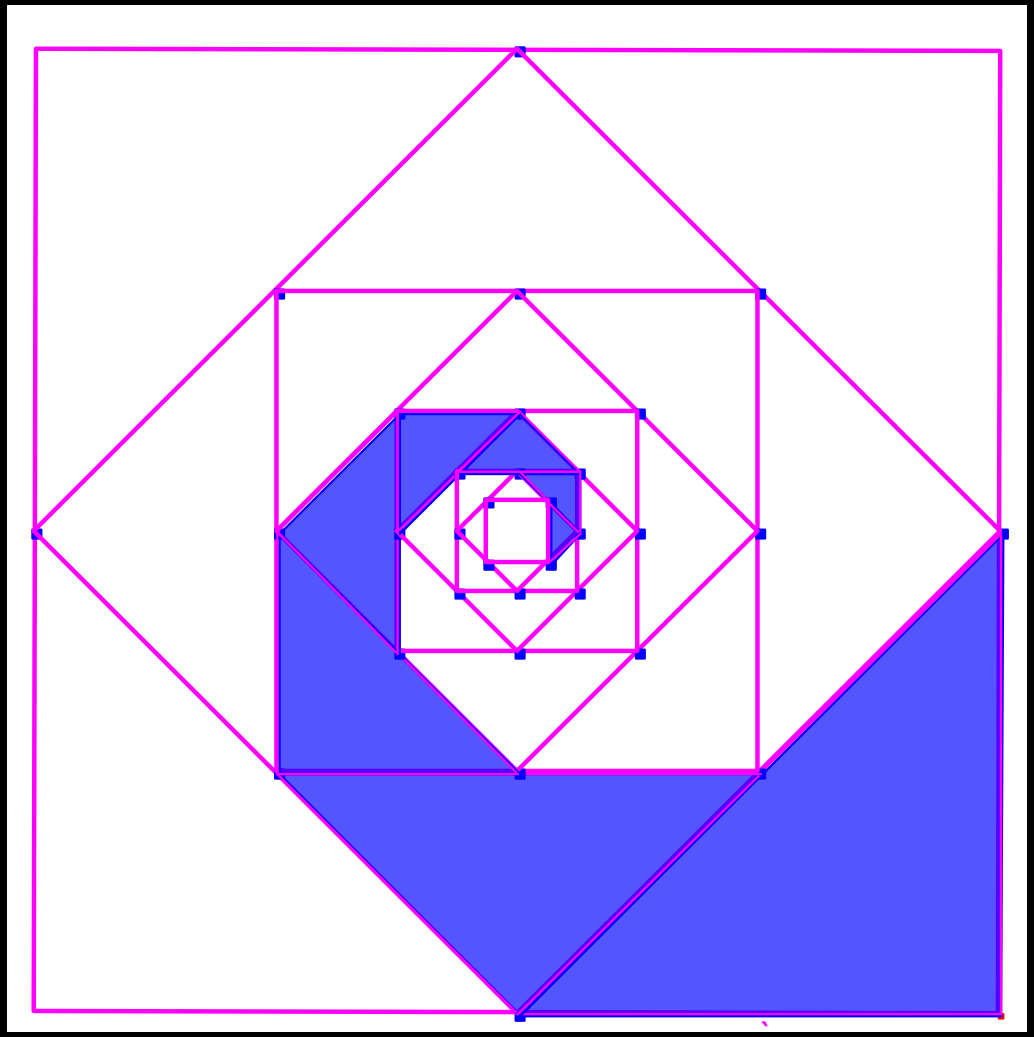


Mark the midpoint of each side of the new square.

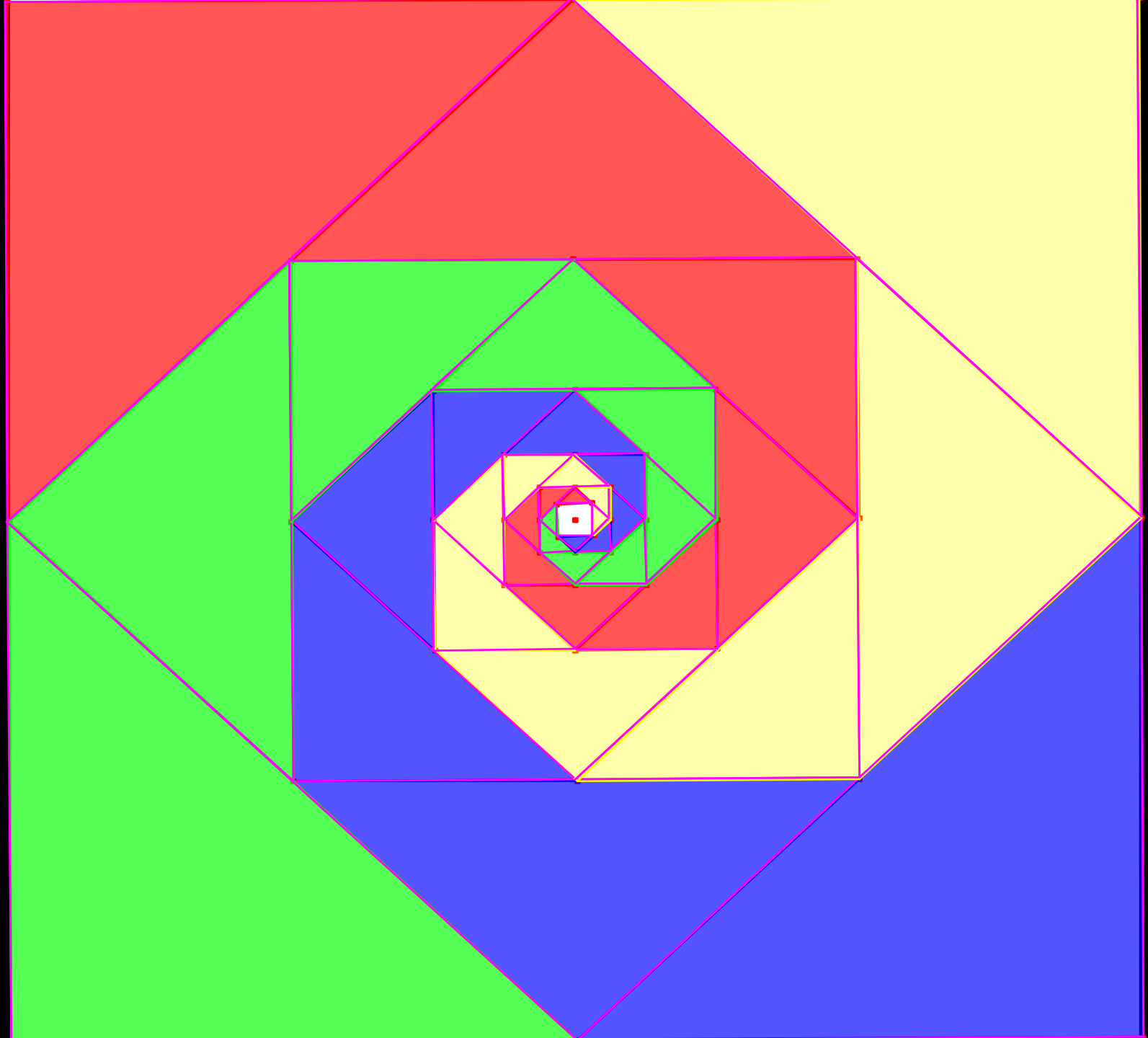


Join the midpoints to make a new square. Colour the triangle underneath the new square.

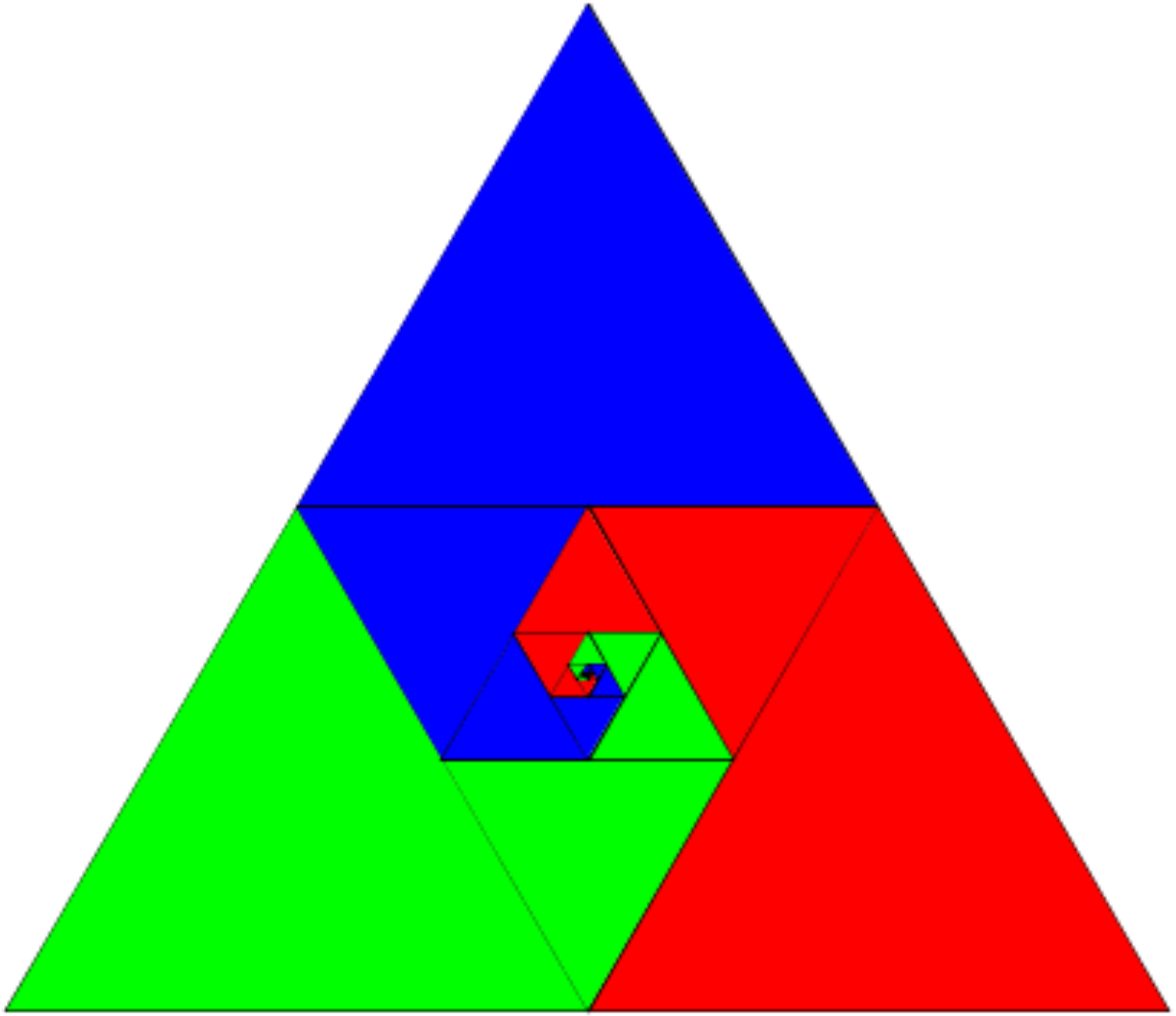


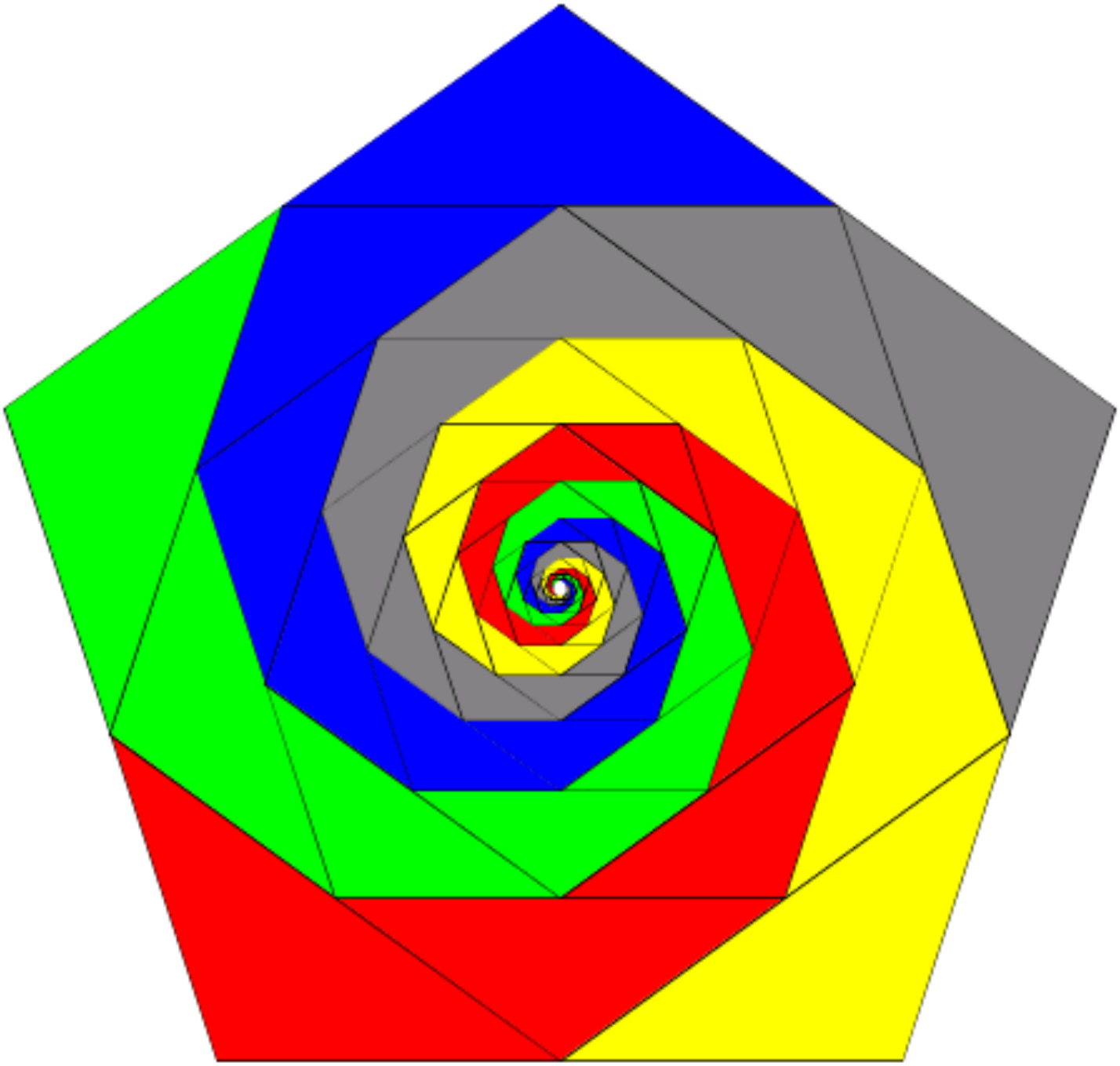


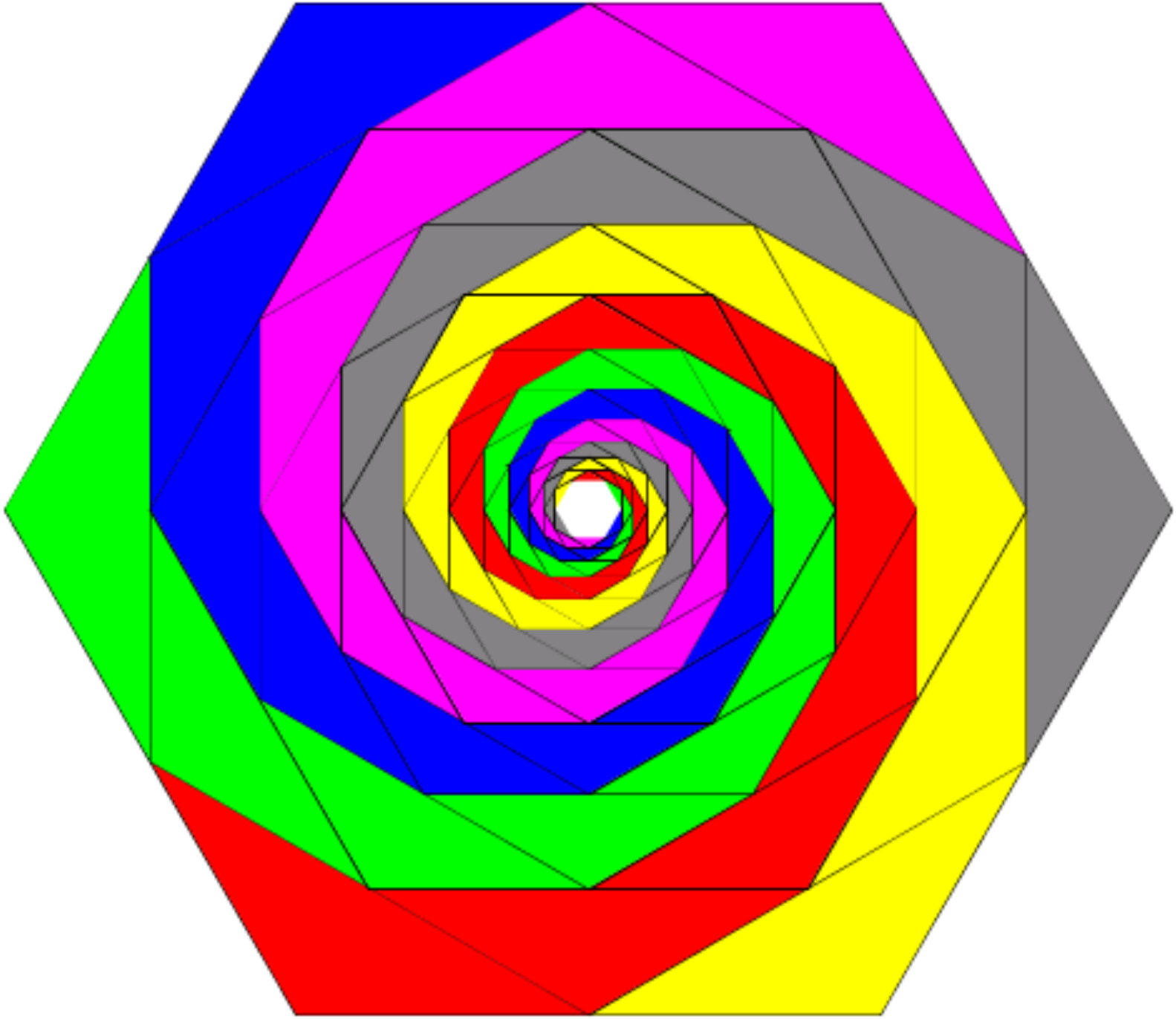
Continue to draw new squares and colour triangles until the square is too small to divide again.

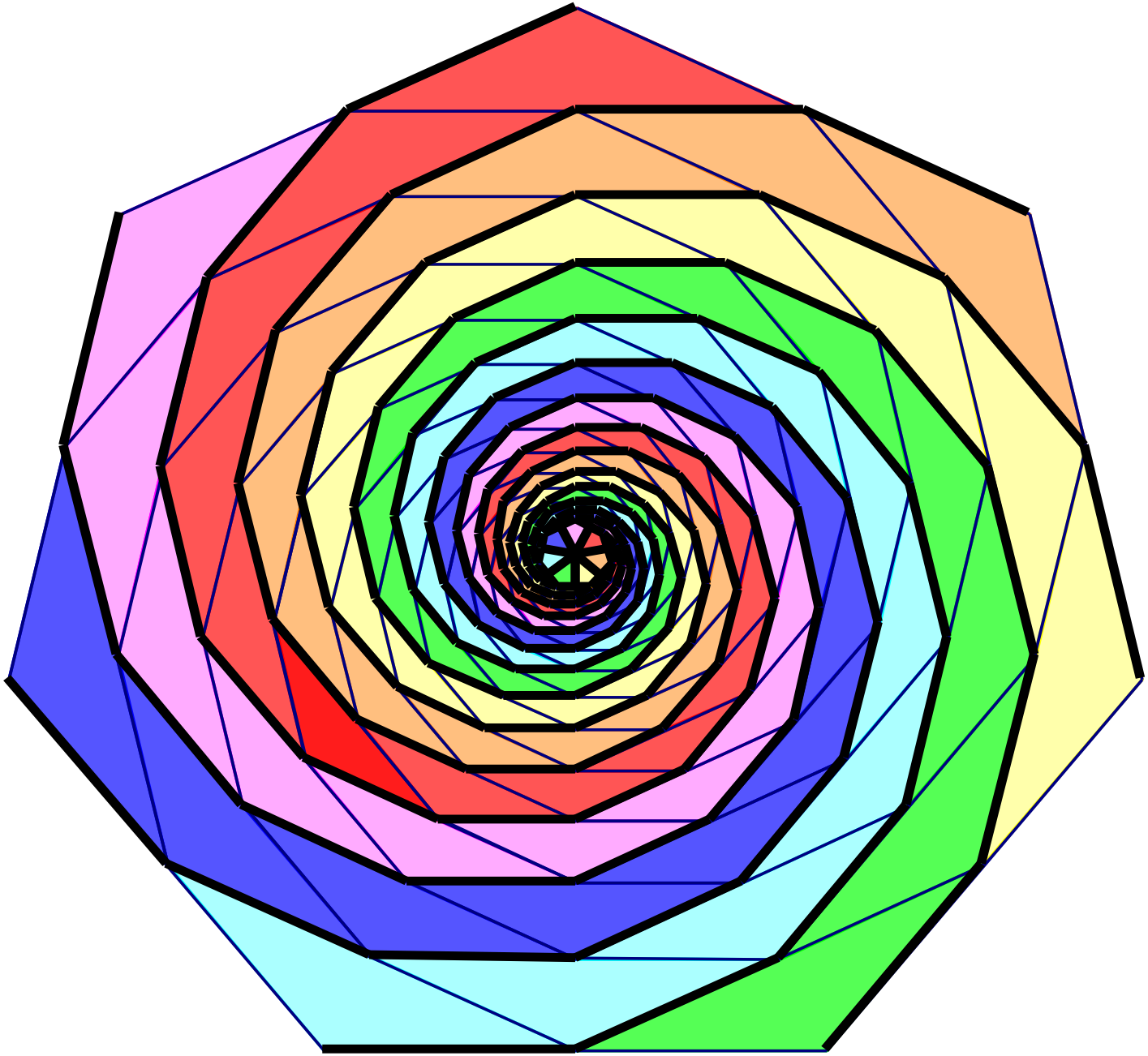


Knitted wall hanging made from Baravelle spirals










The Golden Spiral

Leonardo of Pisa (1170 – 1250 AD) was an Italian mathematician. He is sometimes called Fibonacci.

Fibonacci is famous for helping to spread the Hindu Arabic numbers in Europe. These numbers replaced the Roman number system.


Italy
UNITED KINGDOM
IRELAND
Dublin
Belfast
Glasgow
Manchester
London
North Sea
Celtic Sea
DENMARK
Copenhagen
Amsterdam
NETH.
Hamburg
Berlin
Cologne
GERMANY
Brussels
BELGIUM
LUX.
Luxembourg
Lille
Paris
FRANCE
Bordeaux
Lyon
Marseille
MONACO
Bilbao
ANDORRA
Madrid
SPAIN
PORTUGAL
Barcelona
Valencia
Sevilla
BALEARIC ISLANDS (SP.)
Gibraltar (U.K.)
Ceuta (SP.)
Melilla (SP.)
Rabat
Marrakech
MOROCCO
Algiers
Oran
ALGERIA
Tunis
TUNISIA
Tripoli
LIBYA
Banghazī
Mediterranean Sea
MALTA
Valletta
Sicily (IT.)
Palermo
Sardinia (IT.)
Corsica (FR.)
Naples
Rome
VATICAN CITY
SAN MARINO
Turin
Milan
ITALY
Munich
Prague
CZECH REP.
Vienna
AUSTRIA
SWITZ.
Bern
LIECH.
SLOVENIA
Ljubljana
Zagreb
CROATIA
Sarajevo
BOS. & HER.
SER. & MONT.
Belgrade
HUNGARY
Budapest
SLOVAKIA
Bratislava
POLAND
Warsaw
Łódź
Kraków
RUSSIA
Riga
LAT.
LITH.
Vilnius
Minsk
BELARUS
Baltic Sea
Yaroslavl'
Moscow
Voronezh
Kharkiv
Kiev
L'viv
UKRAINE
MOLDOVA
Chisinau
Donets'k
Odesa
ROMANIA
Bucharest
Black Sea
Sofia
BULGARIA
ALB.
Tirana
Skopje
THE FORMER YUGOSLAV REPUBLIC OF MACEDONIA
GREECE
Athens
İzmir
Istanbul
Bursa
Ankara
TURKEY
Konya
Adana
Nicosia
CYPRUS
Crete (GR.)
LEB.
Beirut
Tel Aviv-Yafo
ISRAEL
Jerusalem
Alexandria
Cairo
Al Jīzah

There is a special sequence of numbers called the Fibonacci sequence because Fibonacci wrote about this sequence.

0 , 1 , 1 , 2 , 3 , 5 , 8 , 13 , 21 …

Fibonacci numbers can be found in many places, for example the number of petals on a flower is often a Fibonacci number.

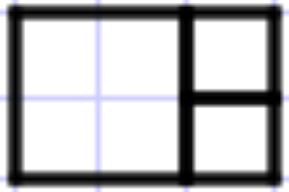
The numbers in the Fibonacci sequence can be used to form a spiral. This spiral can be found in natural things and is sometimes called the golden spiral.

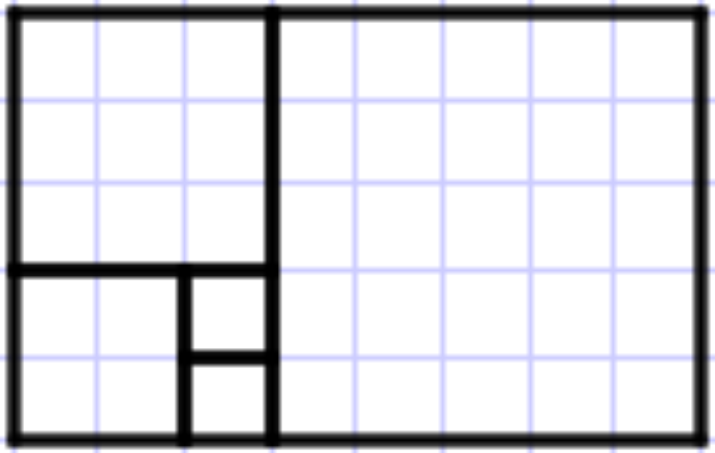
Chameleon's tail

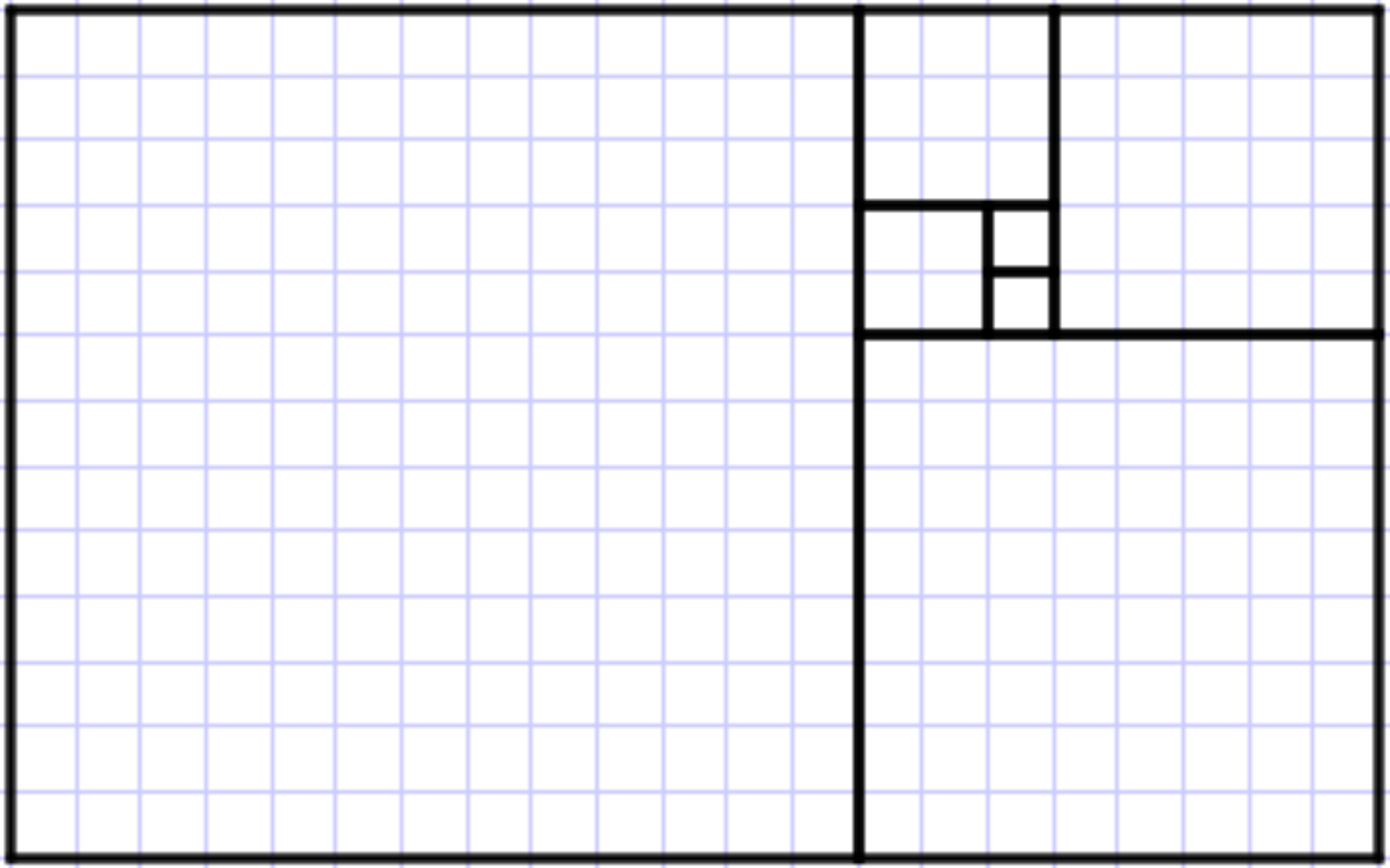
Nautilus Shell

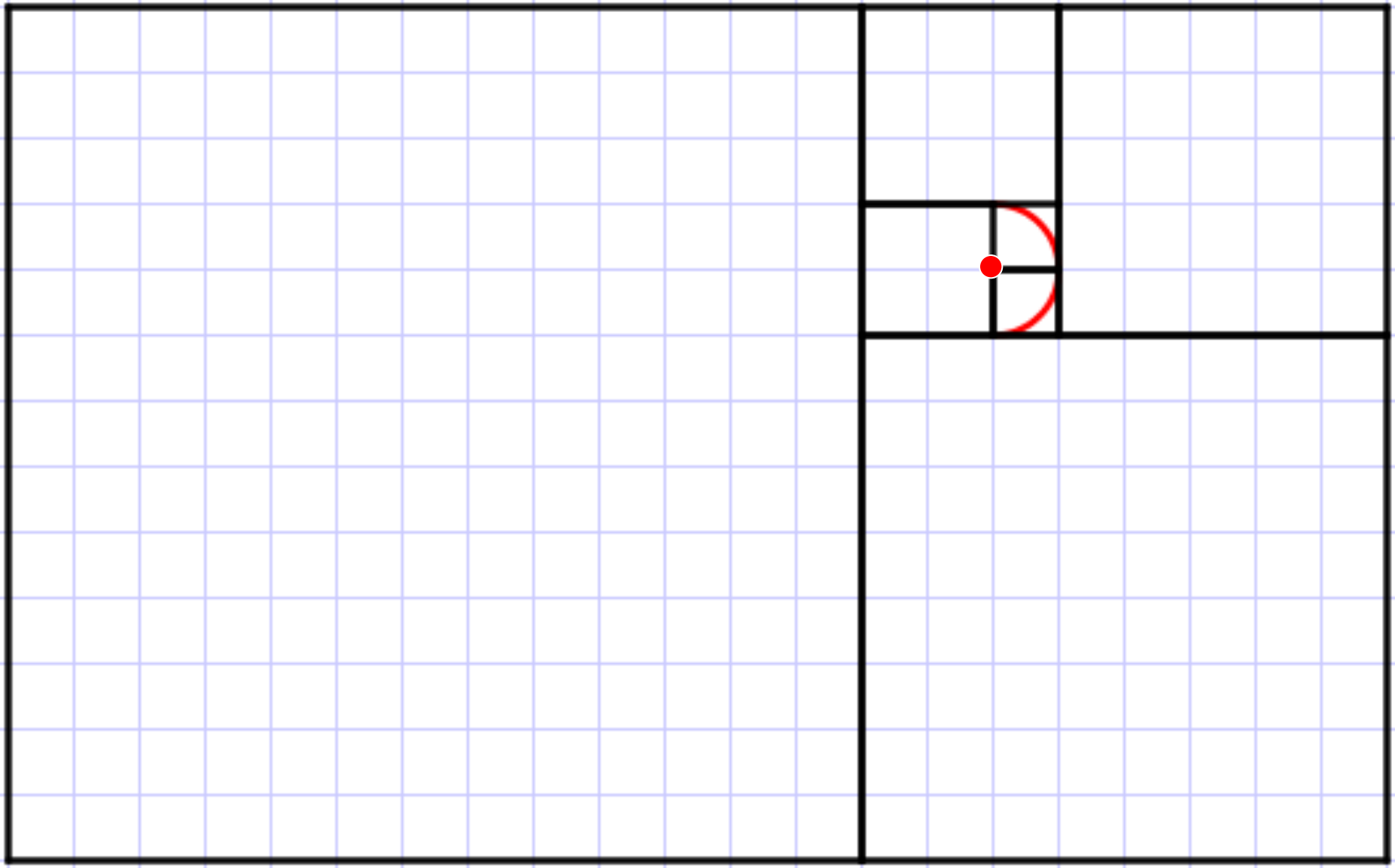
Fibonacci

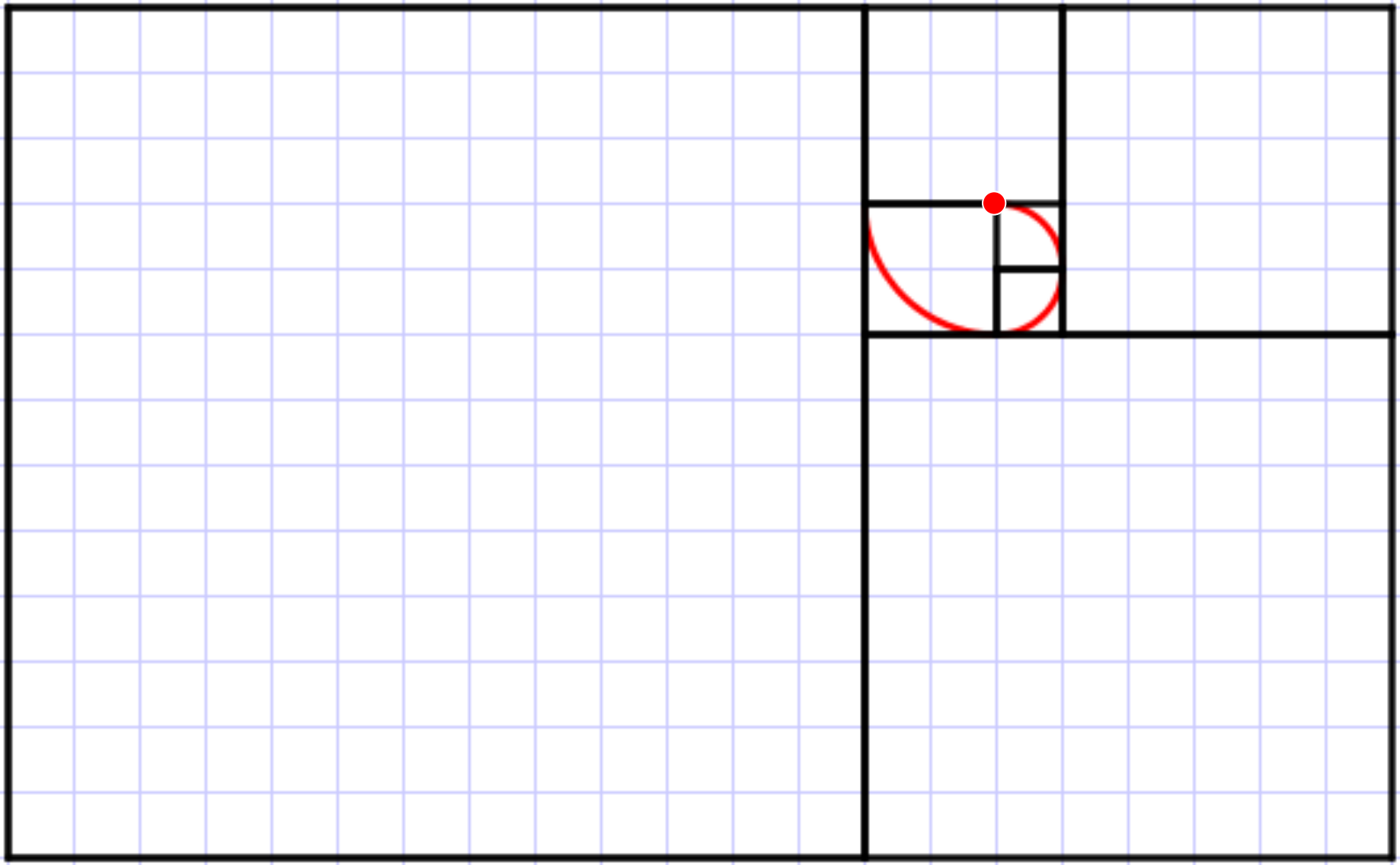
1 1 2 3 5 8 13 21 34 55 89 144 233 377 610 987 1597 2584 4181 6765 10946 17711 28657 46368 75025 121393 196418 317811 514229 832040

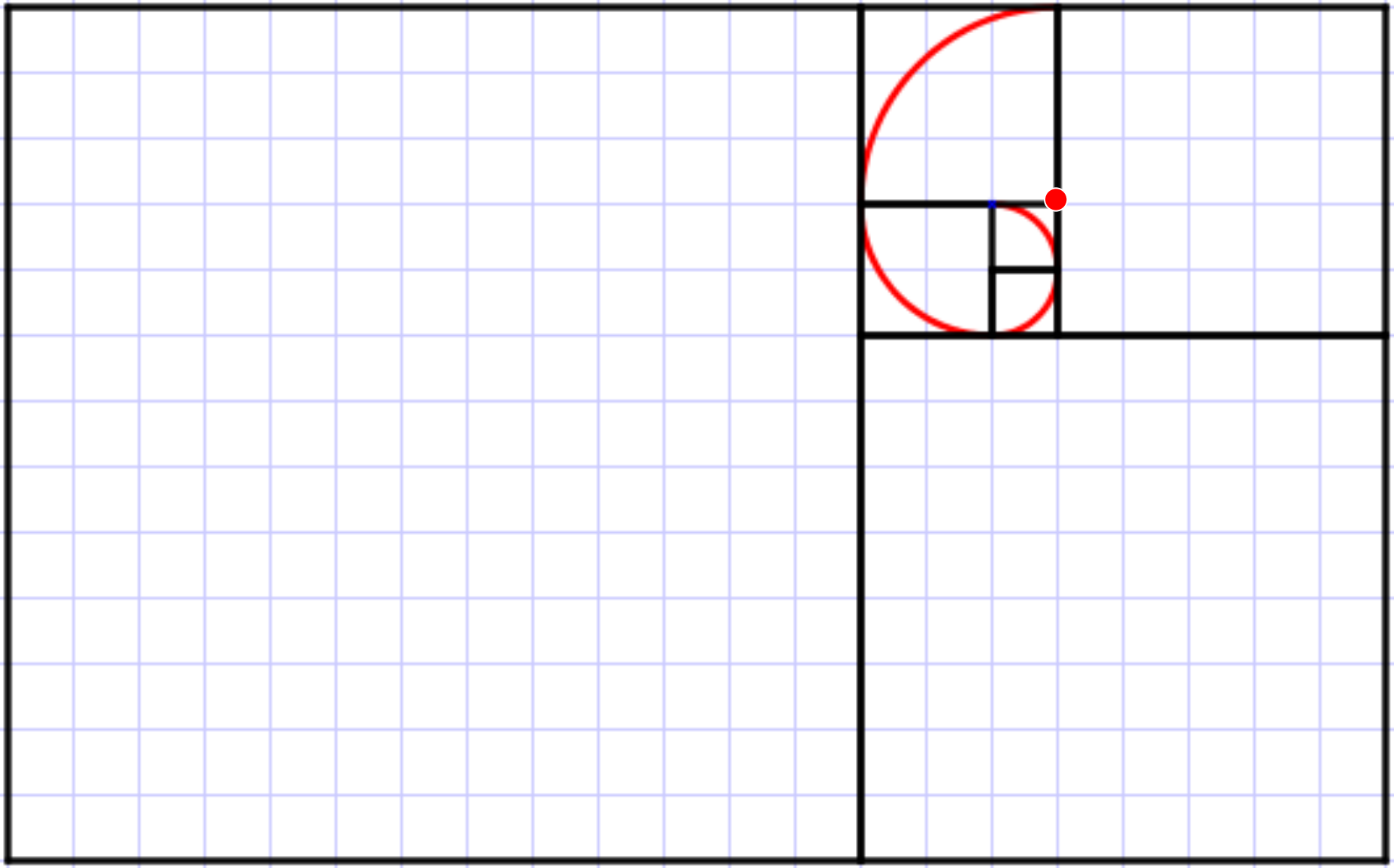


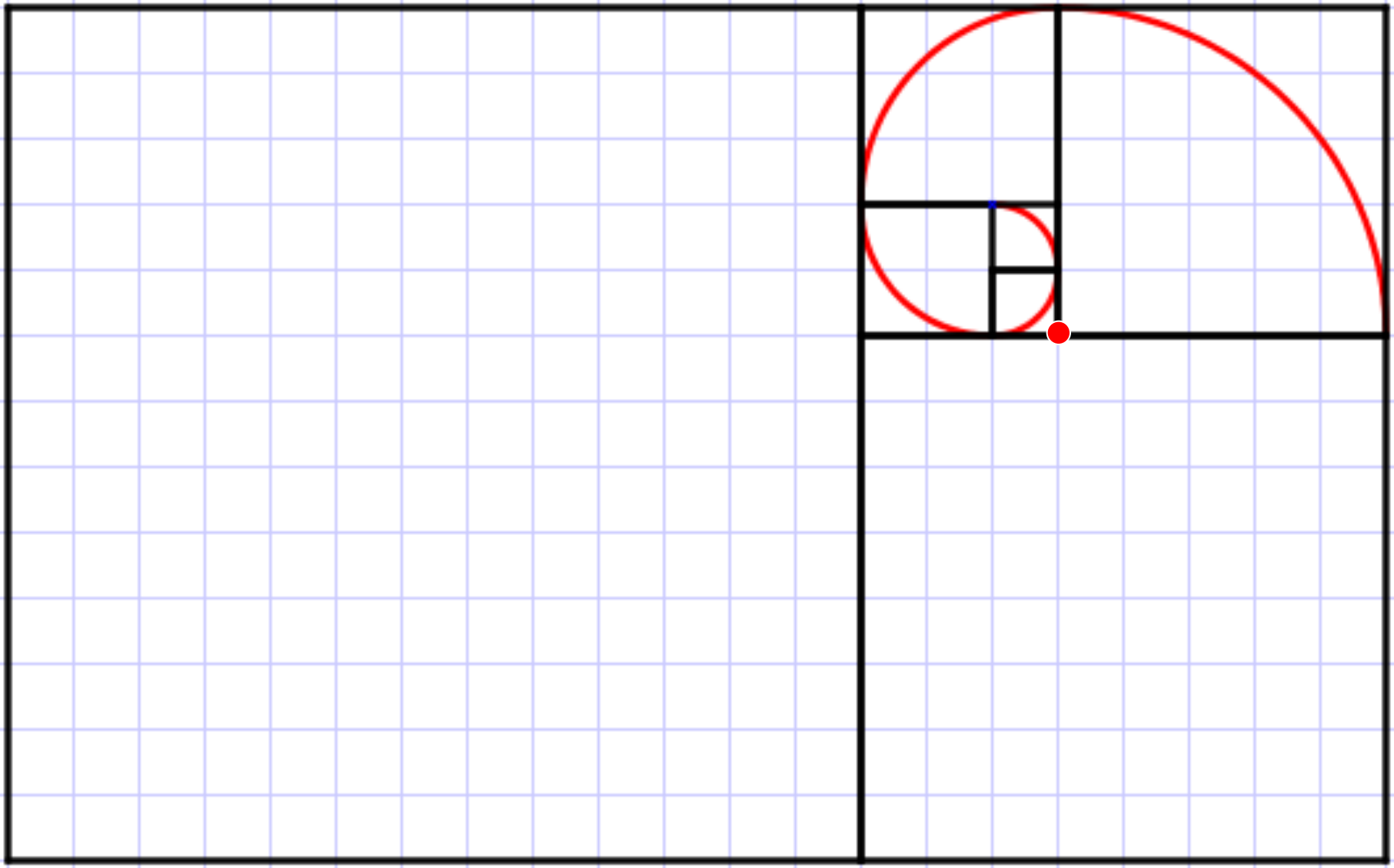


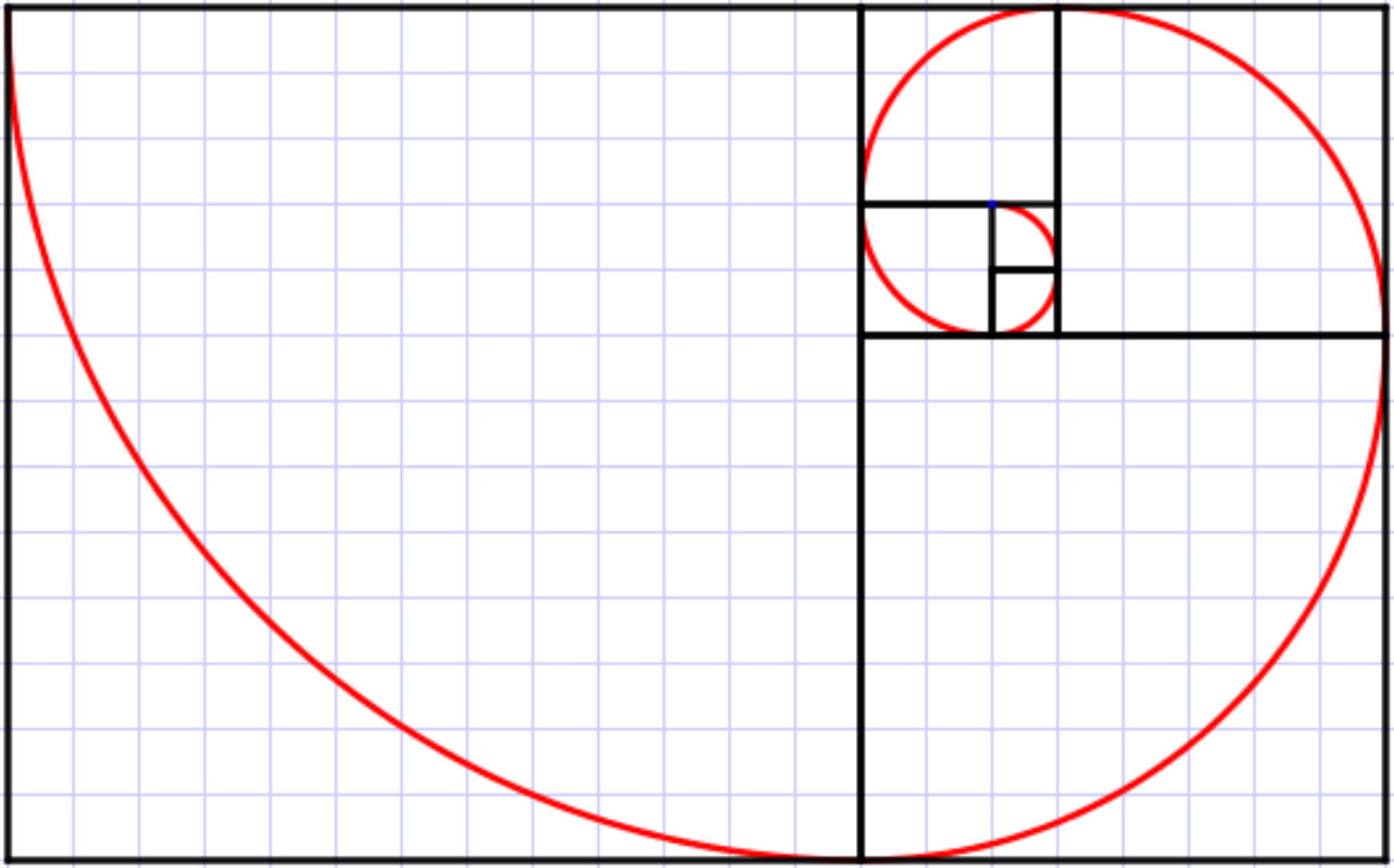


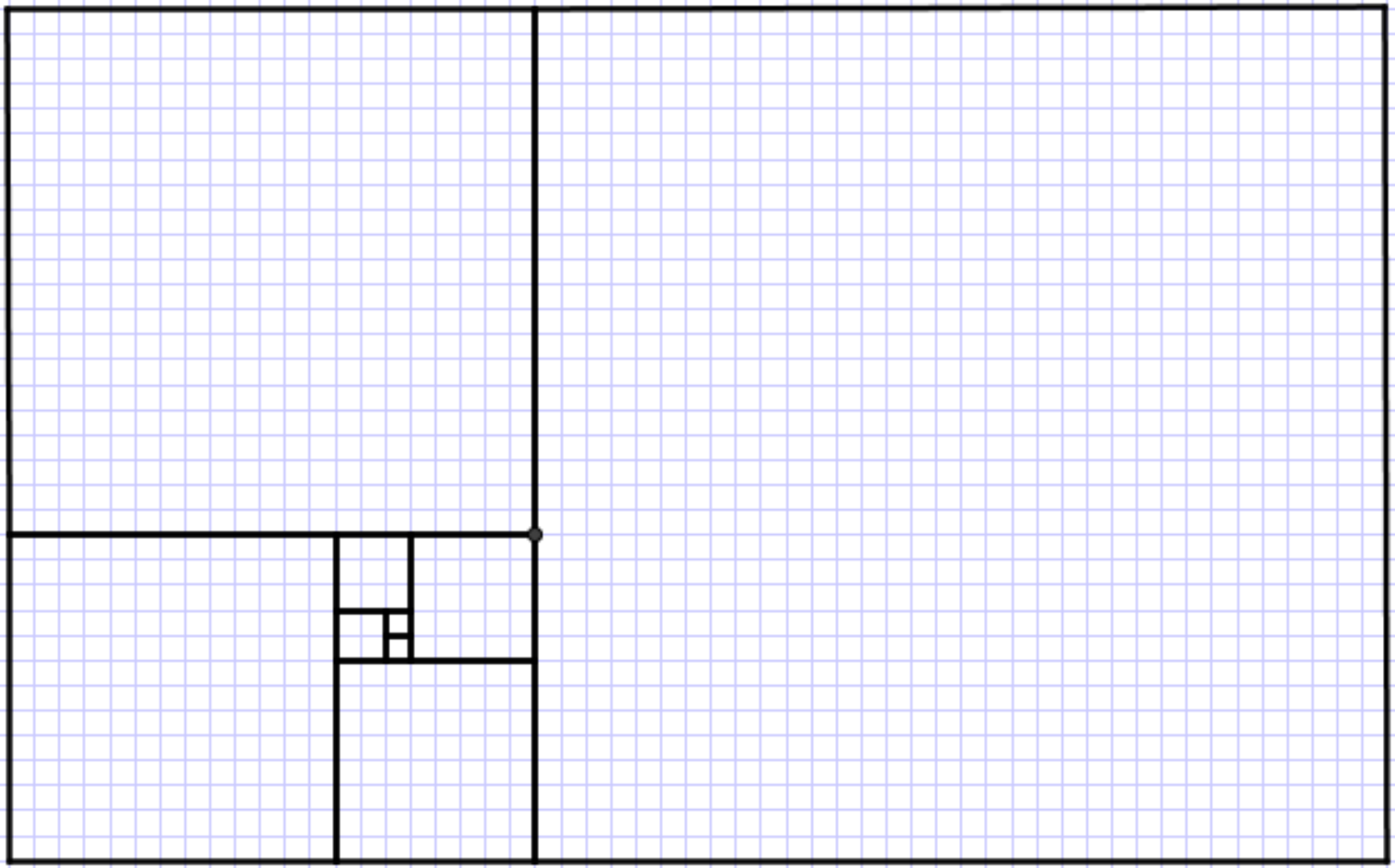


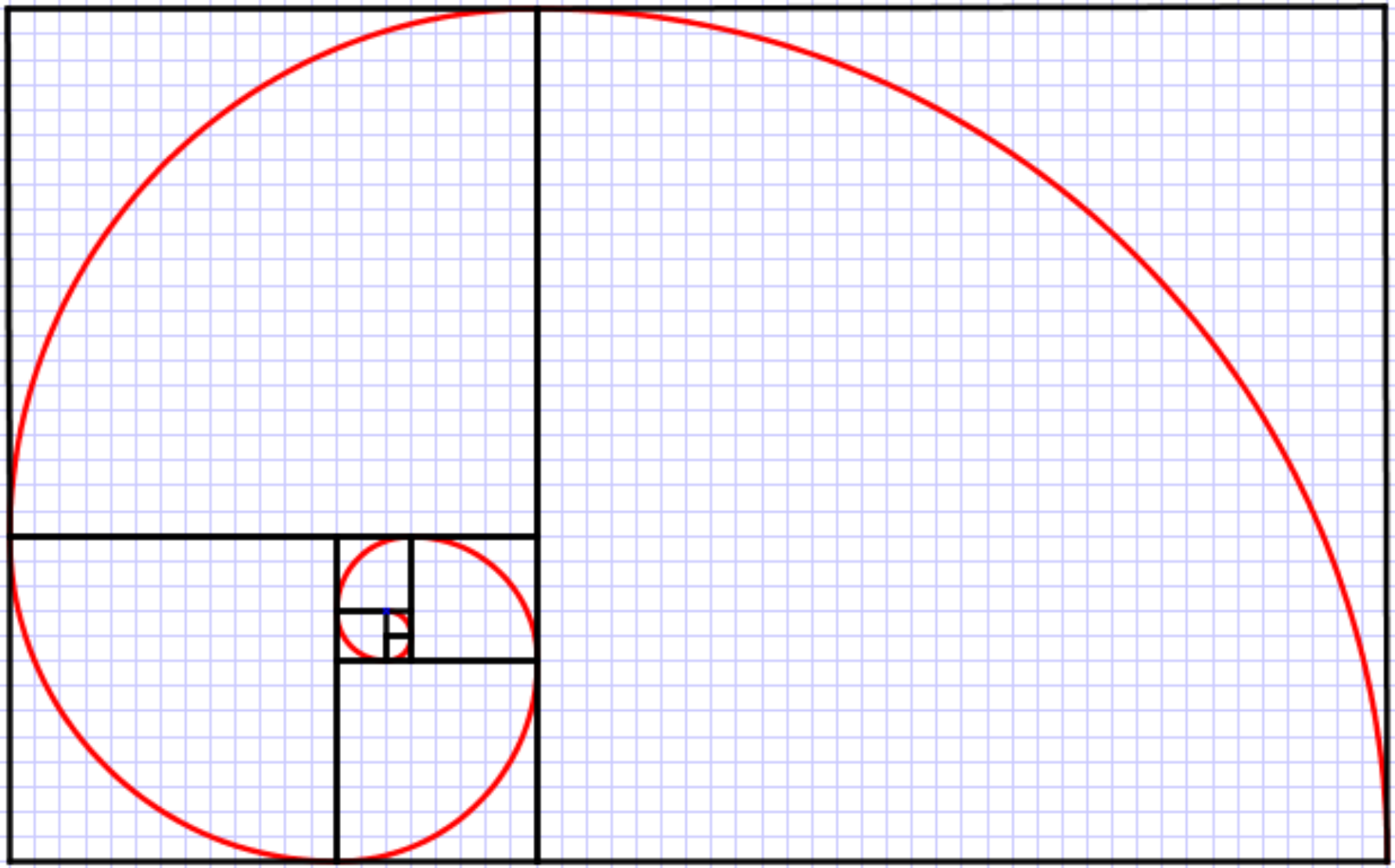


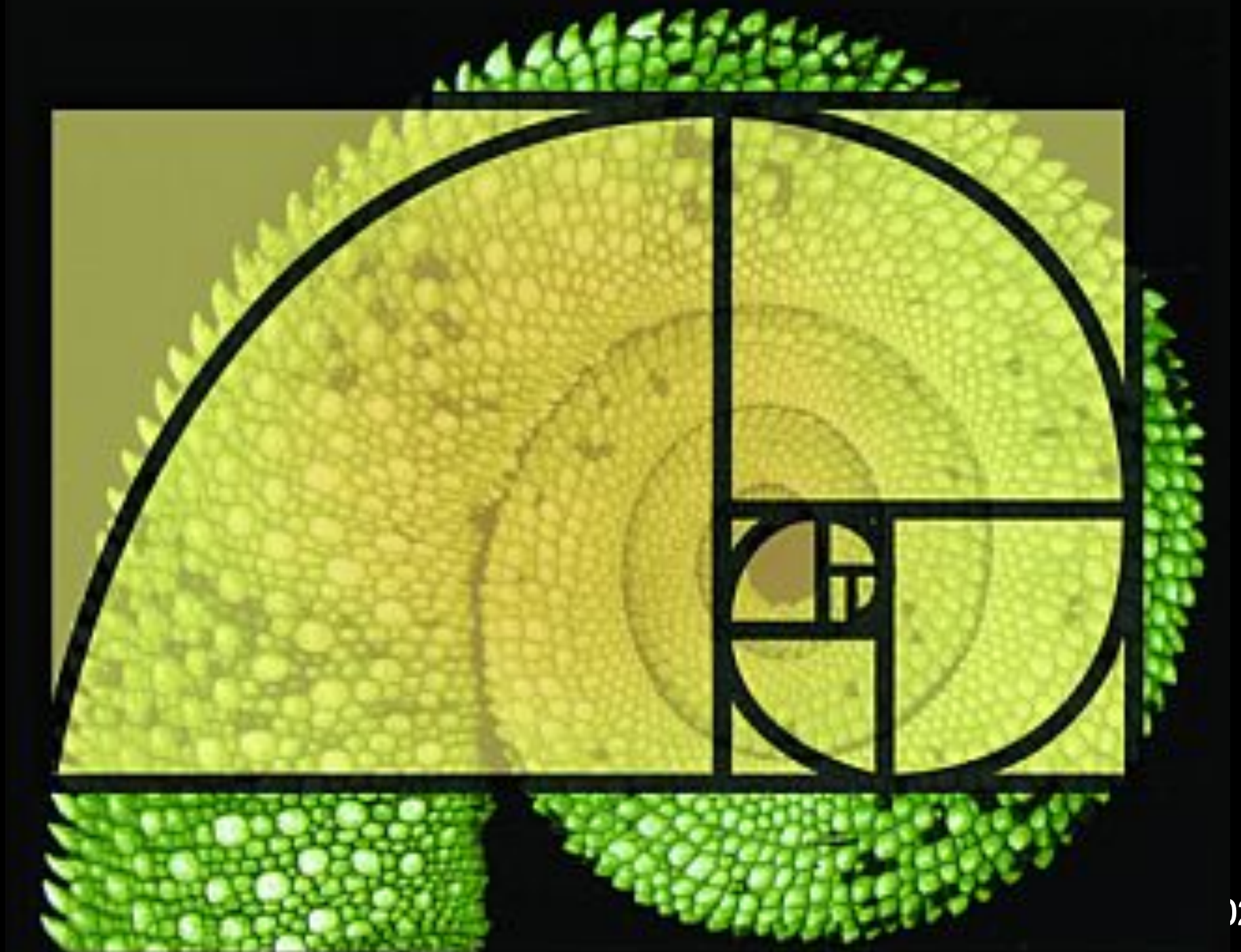


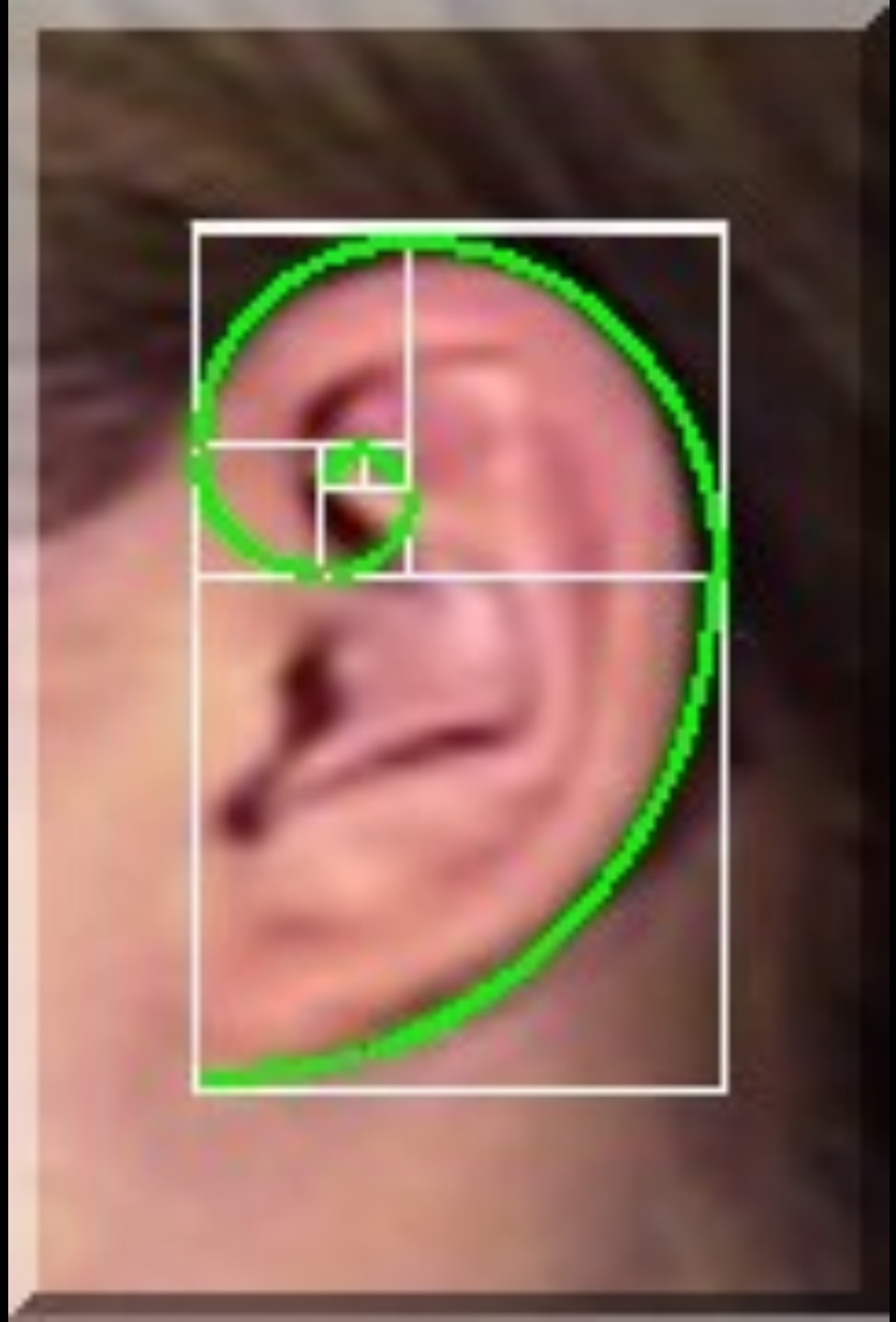


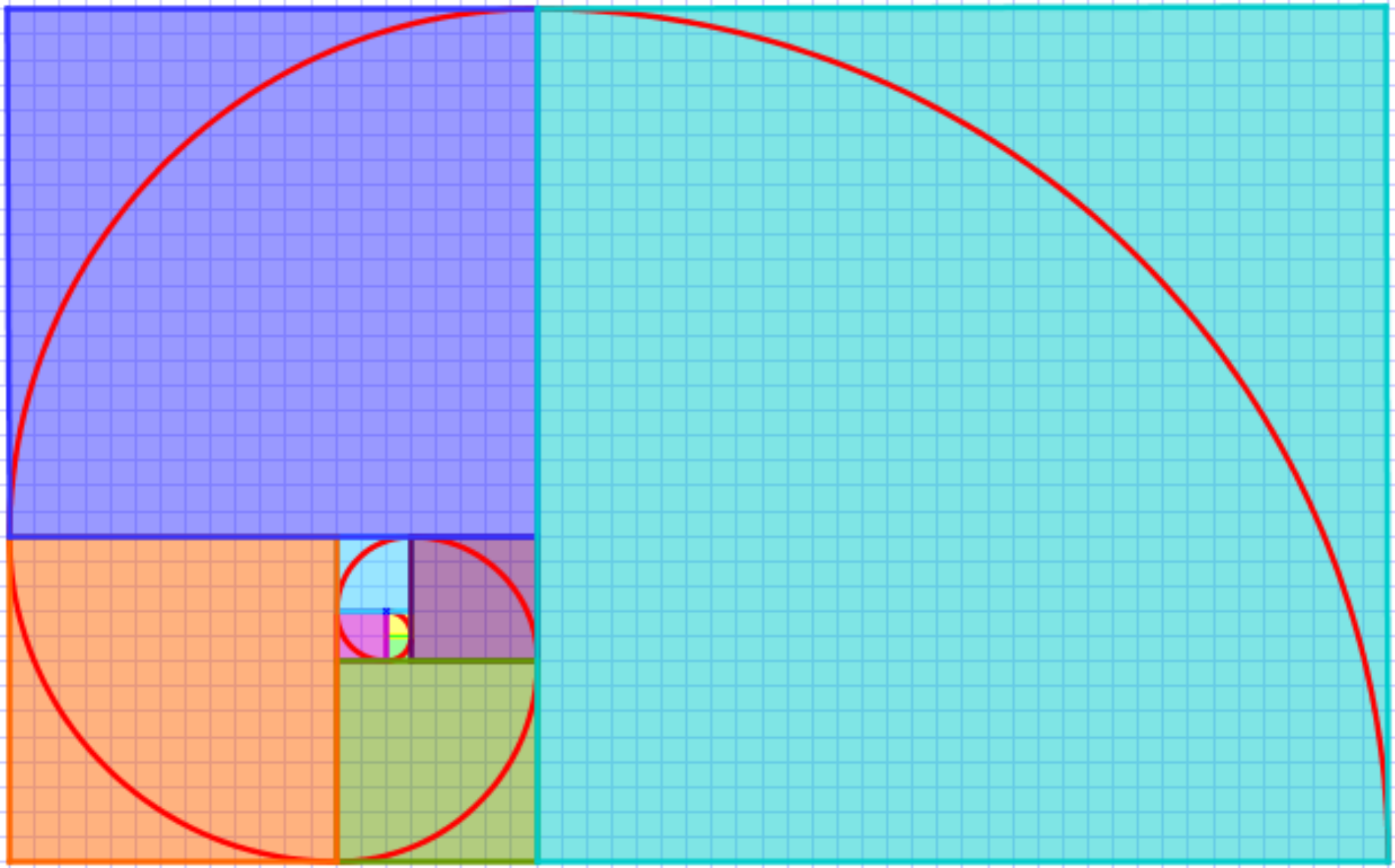


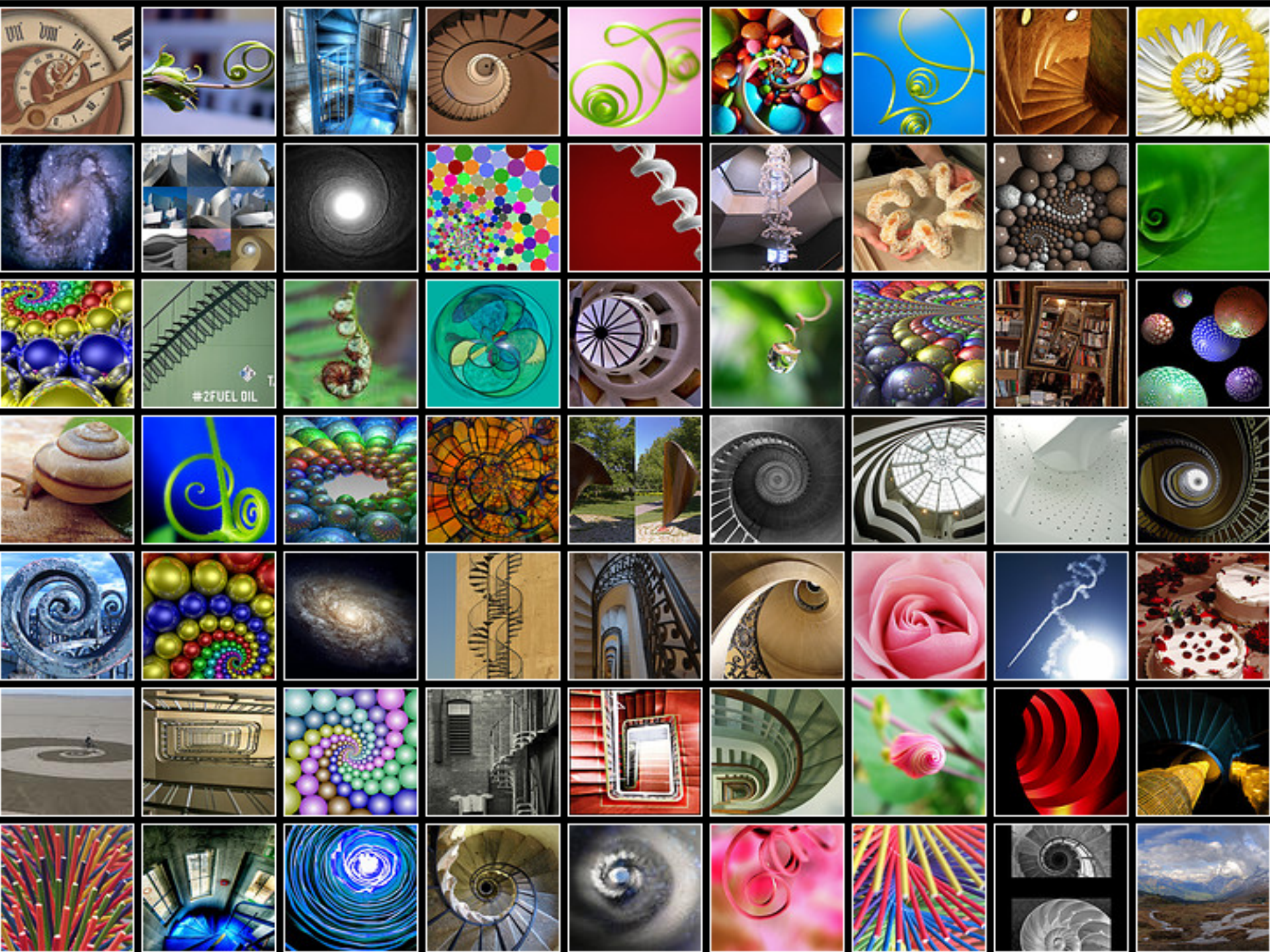


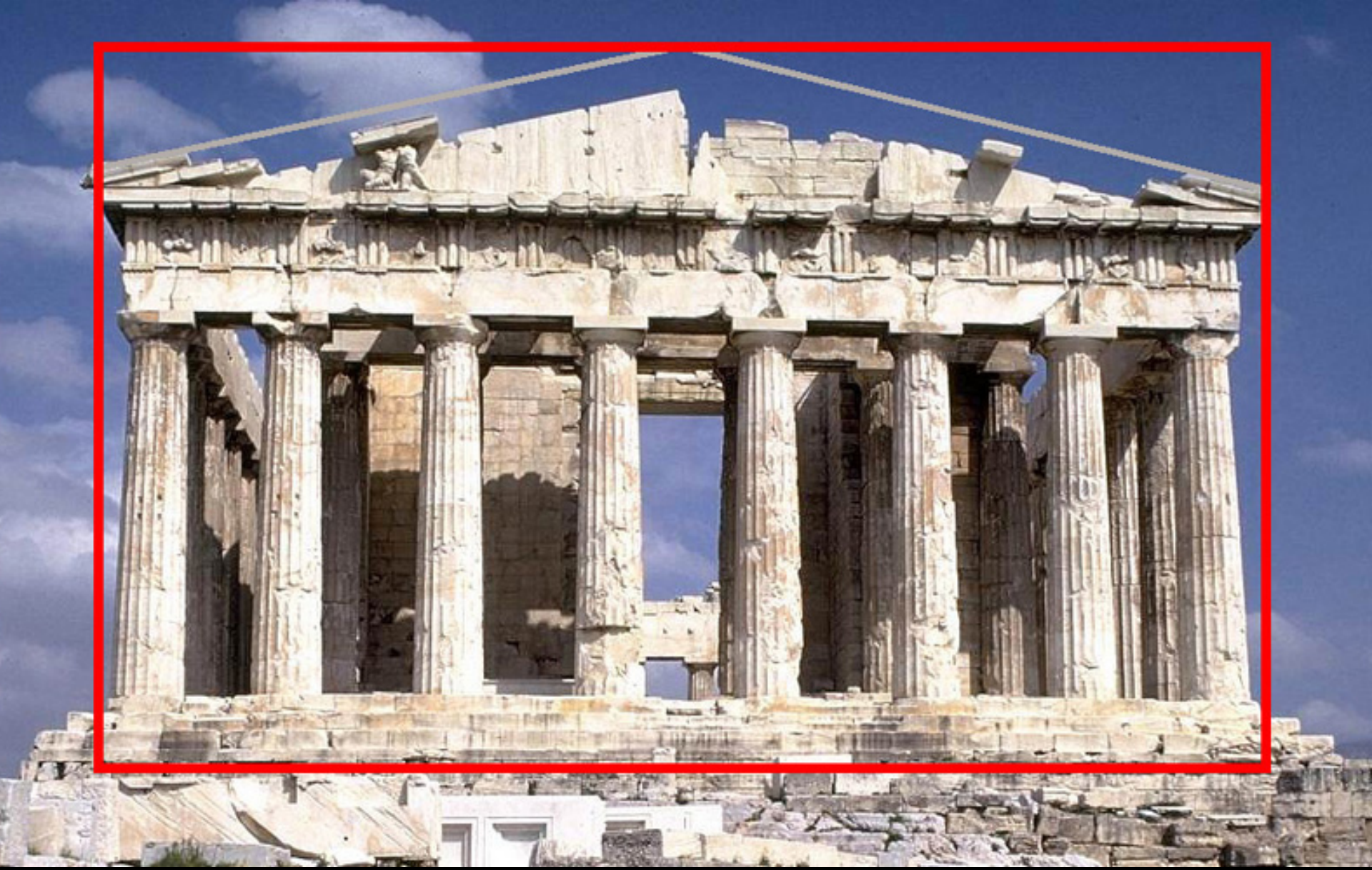


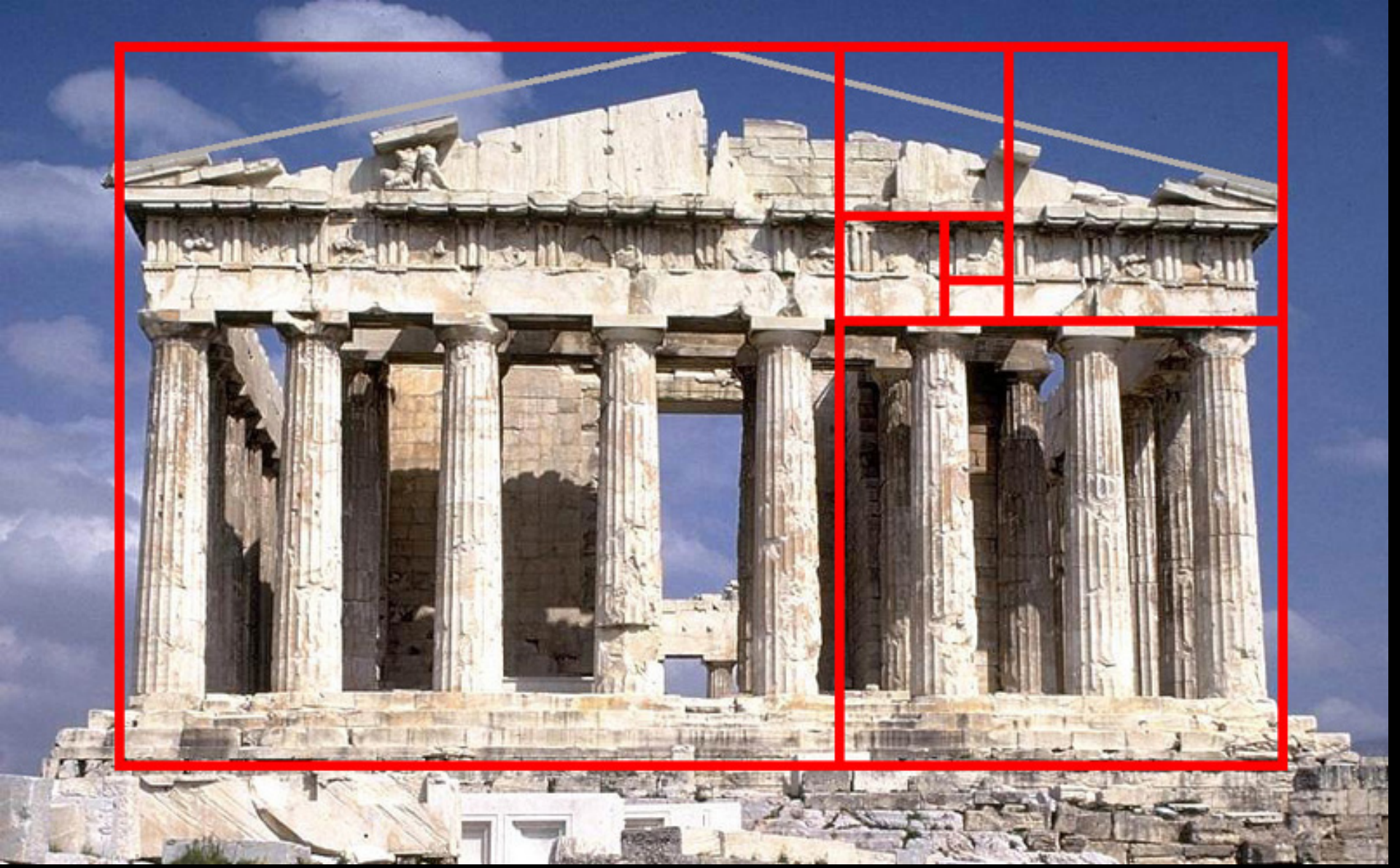







#2FUEL OIL



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