RELATIONSHIP OF MATHEMATICS AND ART

PAINTINGS AND MUSIC

INTRODUCTION

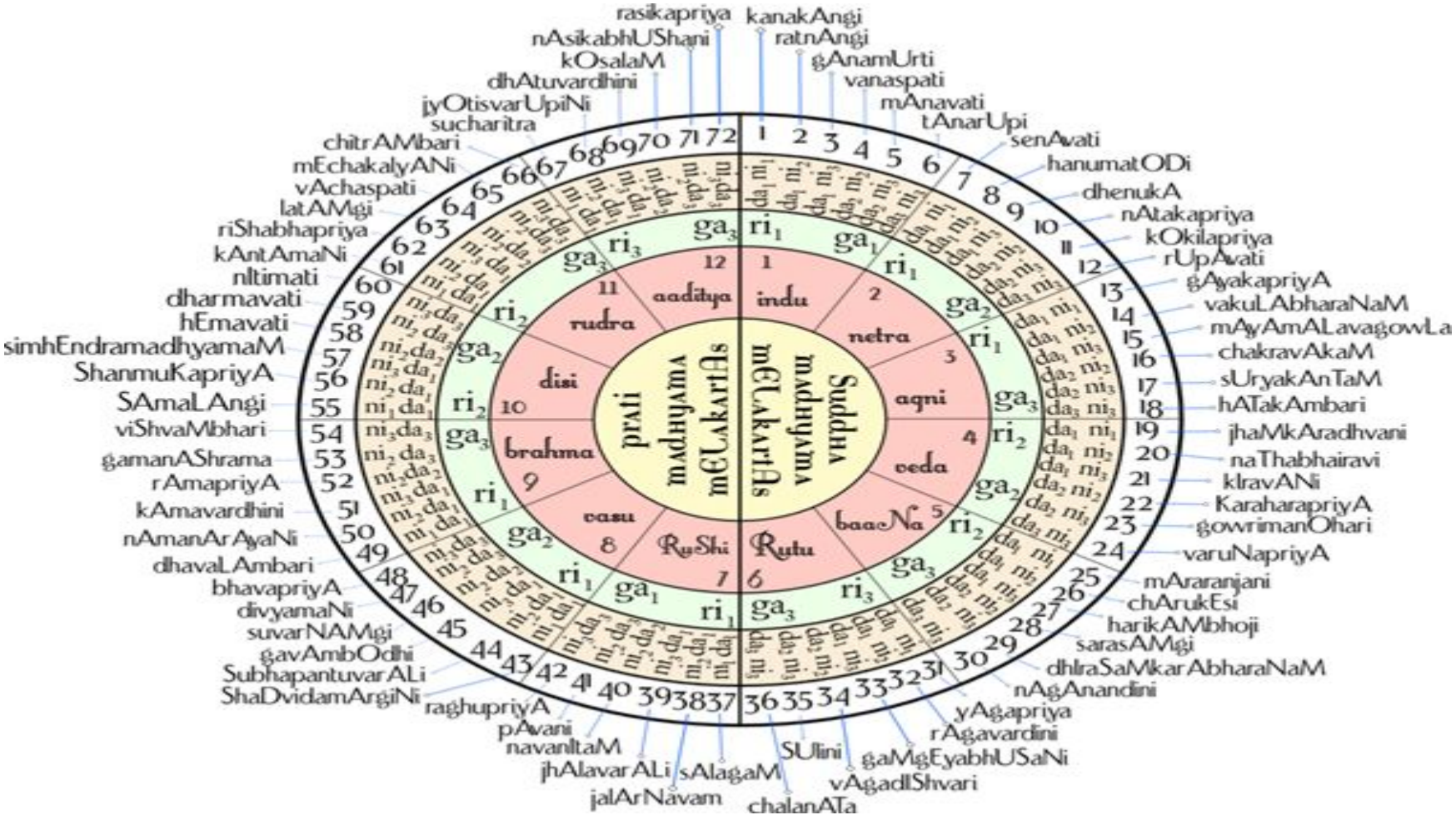
Is mathematics just a matter of complicated calculations by serious men in heavy glasses? Or is it related to art? At first glance, it may seem like mathematics and art are polar opposites. Mathematics is about calculation, logic and proof whereas art is an expression of emotions, feelings, creativity and aesthetics. But the relationship between these two things is deeper than we imagine. In this article, I will try to discuss about the practical application of mathematics through different mediums of art or the efforts of various creative people of the world to bring out the inner beauty of mathematics in their artistic works.

There are very few people who do not like to listen to music or draw pictures. But compared to that, such people who like mathematics are few. Rather, most people can survive if they can maintain as much distance from mathematics as possible. So how can a subject as unappealing and intimidating (to most people) as mathematics relate to something as universal and well-known as art? If we look a little deeper, we can see the subtle relationship between these two things. The most beautiful language to explain everything in the universe is mathematics. And if art is the most creative way to express nature and our emotions, then mathematics and art must be interrelated.

Maths and Music

PYTHAGORAS AND NOTES

Pythagoras, a Greek mathematician, was the first to explain the mathematical basis of music, focusing on the science of sound and harmony. He introduced the concept of consonance and dissonance, which are related to pitch and octave. For example, the C note in a piano produces sound at a frequency of 262 Hz. When combined with another note in a 1:2 ratio, they form an octave. Consonant chords or melodious tones are notes of the same frequency that produce the same sound. These ratios are related to frequency and the length of the string attached to each key in the piano.


Suddha madhyama mELakartAs
prati madhyama mELakartAs
indu
netra
agni
veda
baaNa
Rutu
RuShi
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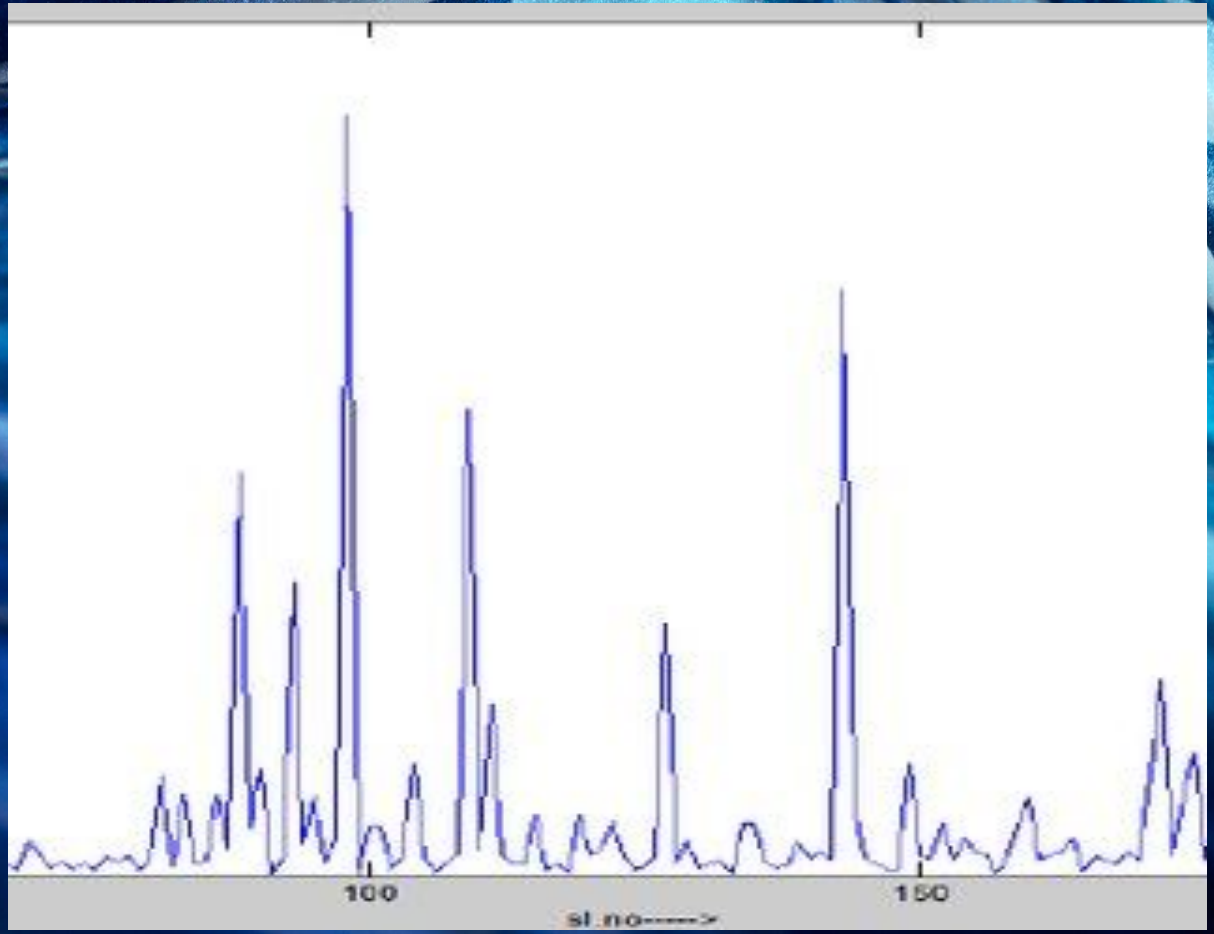
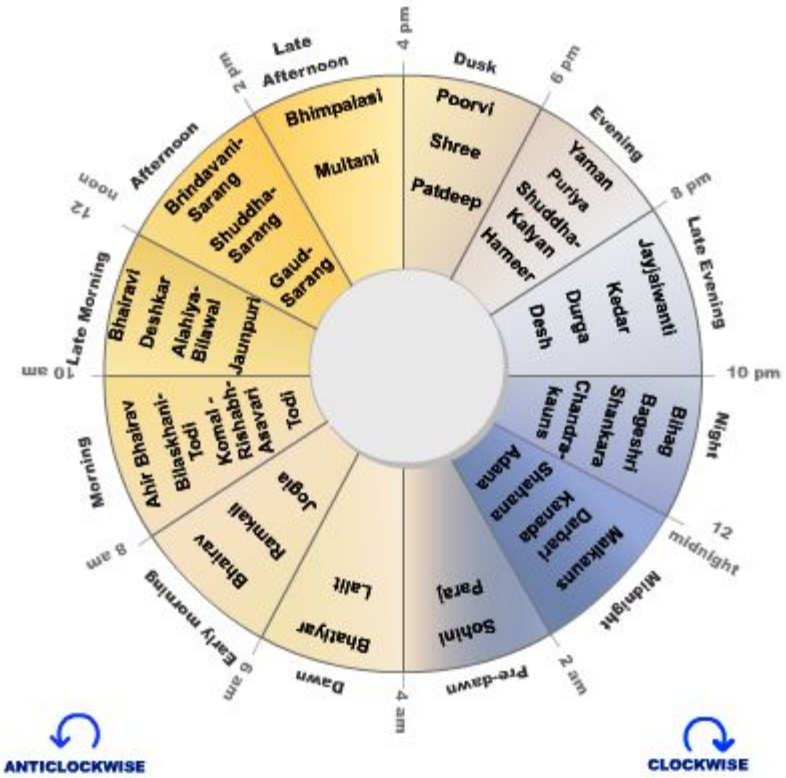
brahma
disi
rudra
aaditya
1 rasikapriya
2 kanakAngi
3 ratnAngi
4 gAnamUrti
5 vanaspati
6 mAnavati
7 tAnarUpi
8 senAvati
9 hanumatODi
10 dhenukA
11 nAtakapriya
12 kOkilapriya
13 rUpAvati
14 gAyakapriyA
15 vakuLAbharaNaM
16 mAyAmALavagowLa
17 chakravAkaM
18 sUryakAnTaM
19 hATakAmbari
20 jhaMkAradhvani
21 naThabhairavi
22 klravANi
23 KaraharapriyA
24 gowrimanOhari
25 varuNapriyA
26 mAraranjani
27 chArukEsi
28 harikAMbhoji
29 sarasAMgi
30 dhIraSaMkarAbharaNaM
31 nAgAnandini
32 yAgapriya
33 rAgavardini
34 gaMgEyabhUSaNi
35 SUlini
36 vAgadIshvari
37 chalanATa
38 jalArNavam
39 sALagaM
40 jhALavarALi
41 navanItaM
42 pAvani
43 raghupriyA
44 ShaDvidamArgiNi
45 SubhapantuvarALi
46 gavAmbOdhi
47 suvarNAMgi
48 divyamaNi
49 bhavapriyA
50 dhavaLAmbari
51 nAmanArAyaNi
52 kAmavardhini
53 rAmapriyA
54 gamanAShrama
55 viShvAMbhari
56 SAmaLAngi
57 ShanmuKapriyA
58 simhEndramadhyamaM
59 hEmavati
60 dharmavati
61 nItimati
62 kAntAmaNi
63 riShabhapriya
64 latAMgi
65 vAchaspati
66 mEchakaLyANi
67 chitrAMbari
68 sucharitra
69 jyOtisvarUpiNi
70 dhAtuvardhini
71 kOsalaM
72 nAsikabhUShani

GRAPHICAL REPRSENTATION OF RAAG RAGESHREE



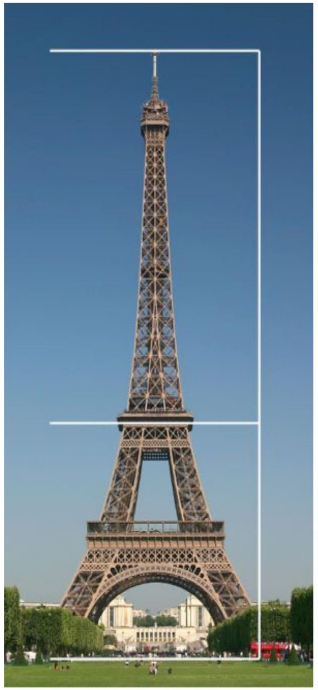
TIME CIRCLE OF VARIOUS RAAGAS

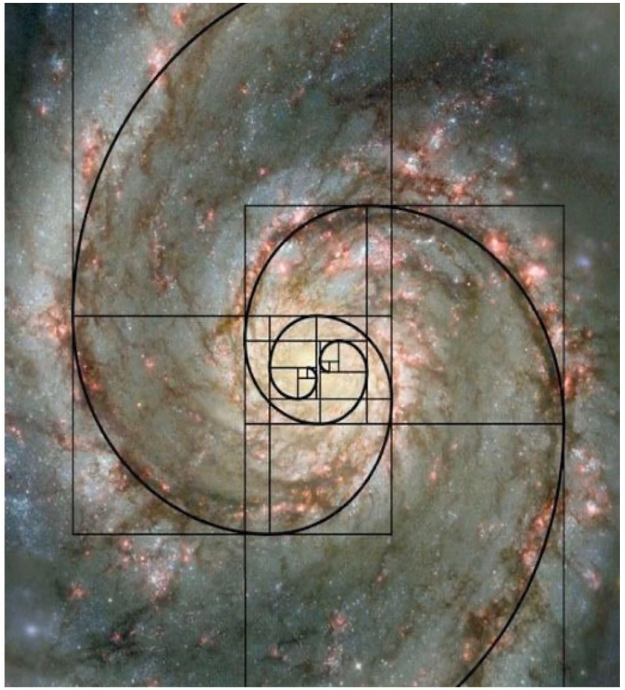


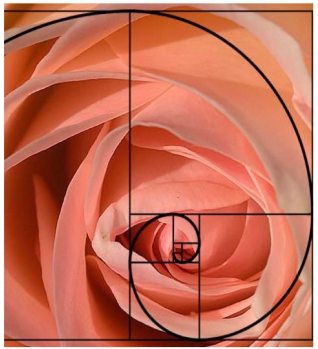
THE GOLDEN RATIO

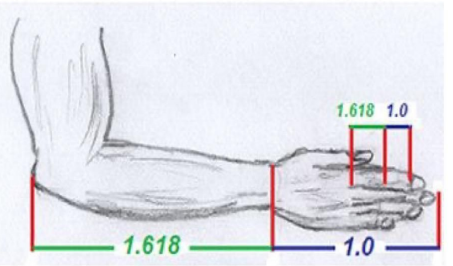
The golden ratio has been a topic of interest since ancient civilization, with Pythagoras first mentioning it in the 5th century BC. Euclid and Aristotle later revealed its aesthetic qualities, with the golden ratio value of 1.618. The Fibonacci sequence, created by Leonardo Fibonacci, reveals the ratio of consecutive numbers in the sequence. This ratio is observed in various patterns of nature, such as the length of a pentagon's side to its diagonal. The golden ratio is also present in various objects, such as flower structures and snail shells.

The ratio is also used in music, with many musicians incorporating it into their compositions and instruments. Wolfgang Amadeus Mozart, a devoted mathematician, was particularly interested in the relationship between music and mathematics, dividing his compositions into two parts: the Exposition and the second part.

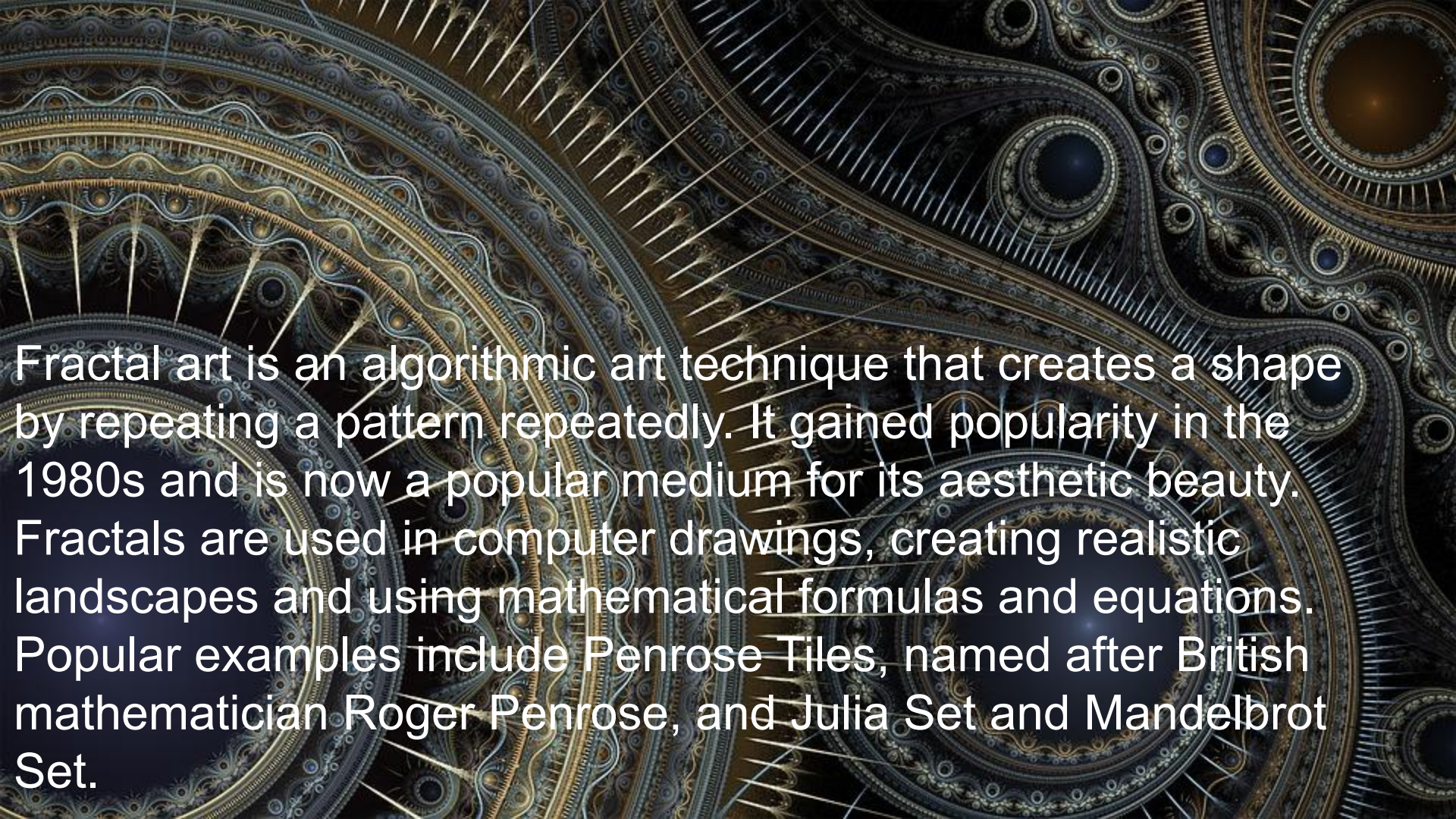




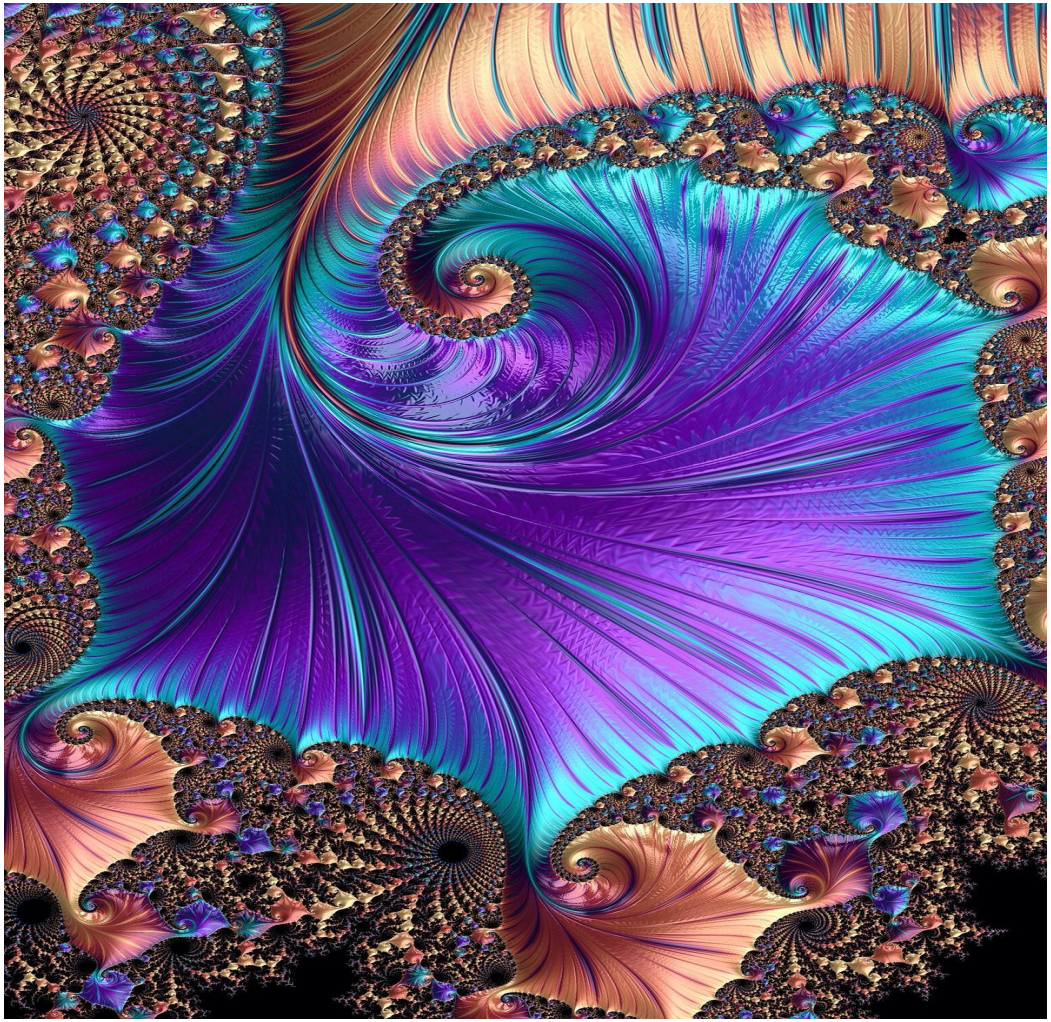




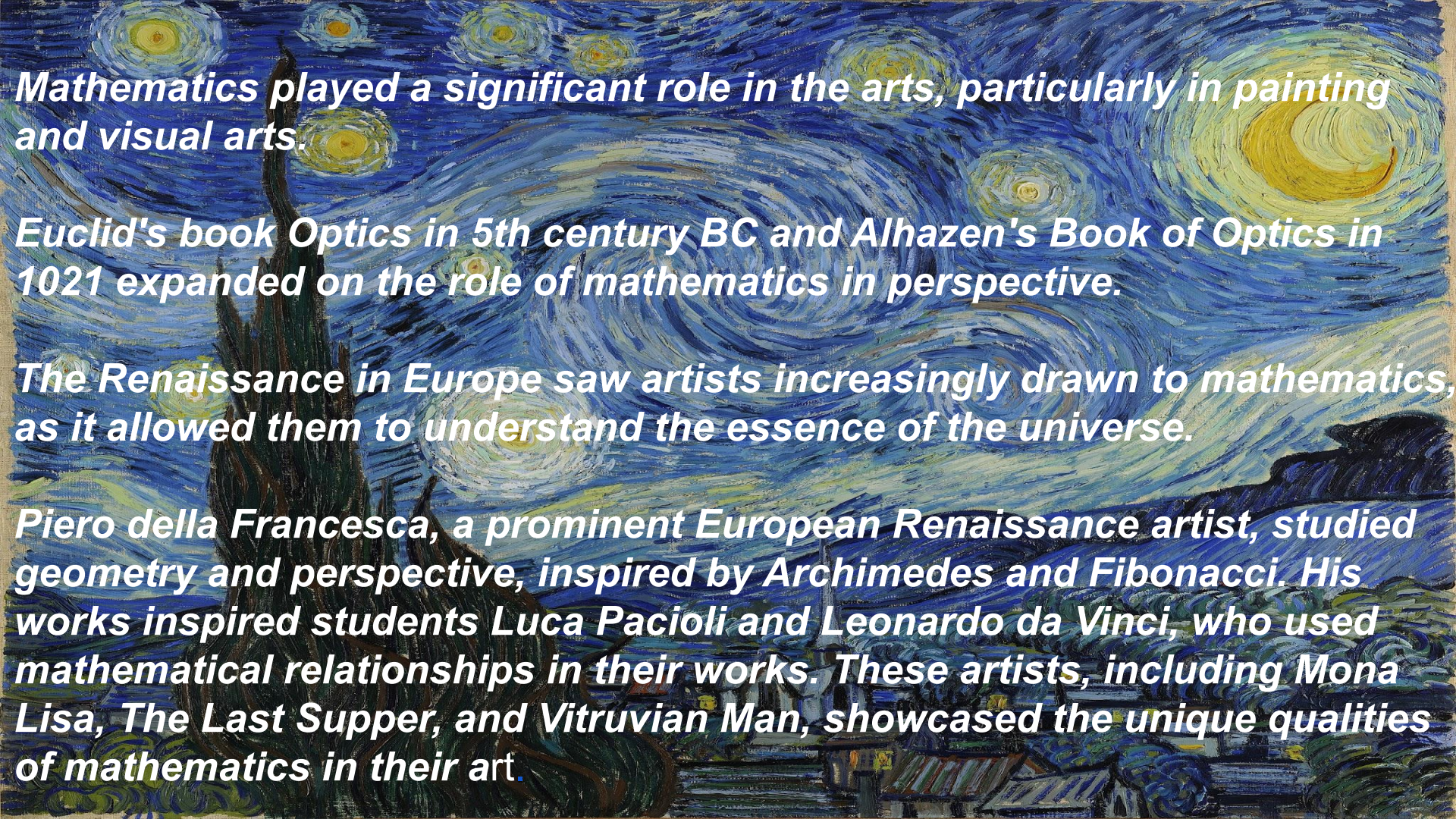
FRACTAL



Fractal art is an algorithmic art technique that creates a shape by repeating a pattern repeatedly. It gained popularity in the 1980s and is now a popular medium for its aesthetic beauty. Fractals are used in computer drawings, creating realistic landscapes and using mathematical formulas and equations. Popular examples include Penrose Tiles, named after British mathematician Roger Penrose, and Julia Set and Mandelbrot Set.



MATHS IN PAINTINGS

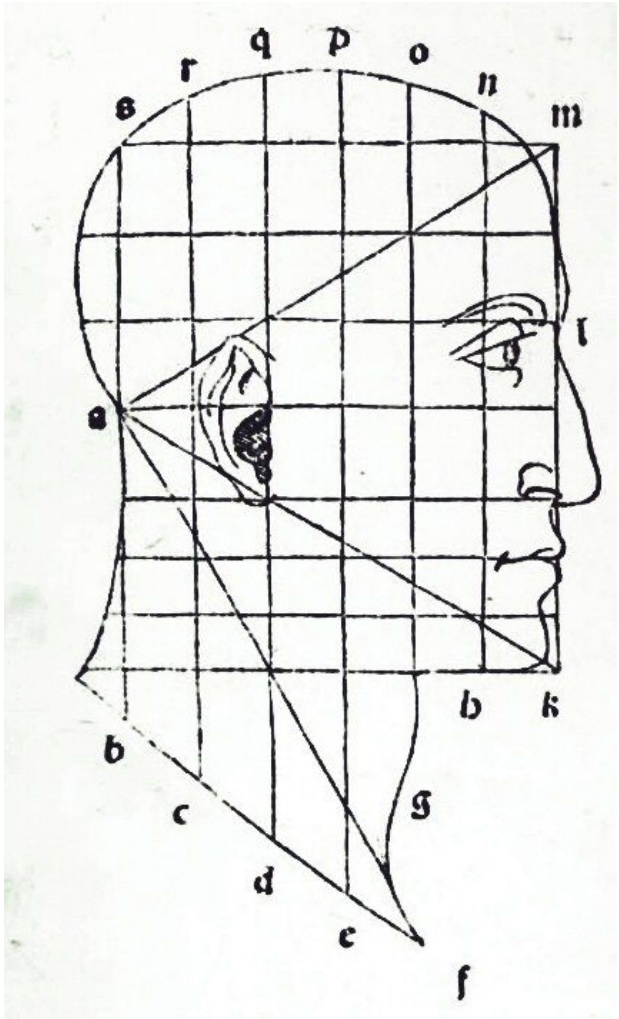


Mathematics played a significant role in the arts, particularly in painting and visual arts.

Euclid's book Optics in 5th century BC and Alhazen's Book of Optics in 1021 expanded on the role of mathematics in perspective.

The Renaissance in Europe saw artists increasingly drawn to mathematics, as it allowed them to understand the essence of the universe.

Piero della Francesca, a prominent European Renaissance artist, studied geometry and perspective, inspired by Archimedes and Fibonacci. His works inspired students Luca Pacioli and Leonardo da Vinci, who used mathematical relationships in their works. These artists, including Mona Lisa, The Last Supper, and Vitruvian Man, showcased the unique qualities of mathematics in their art.



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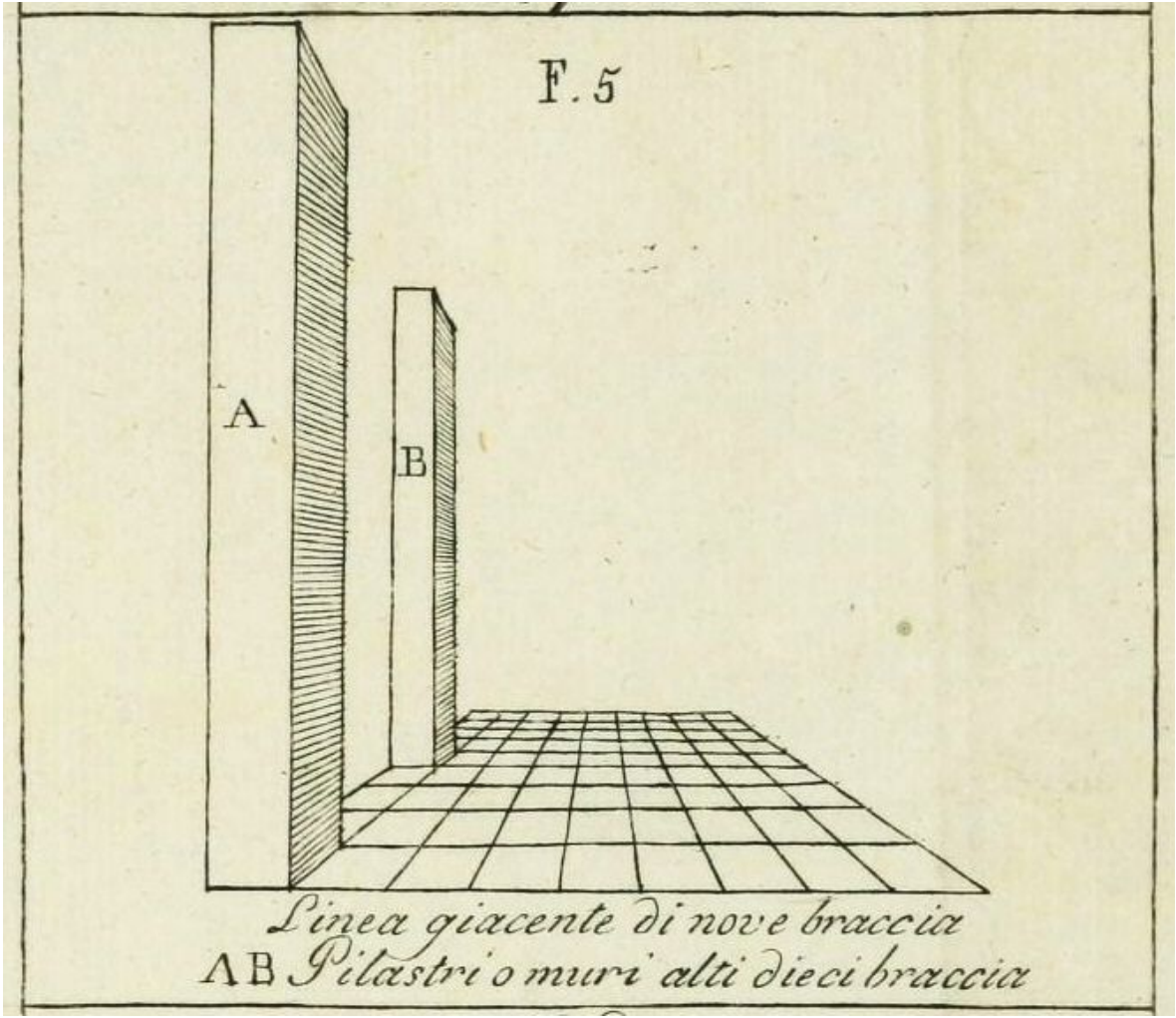
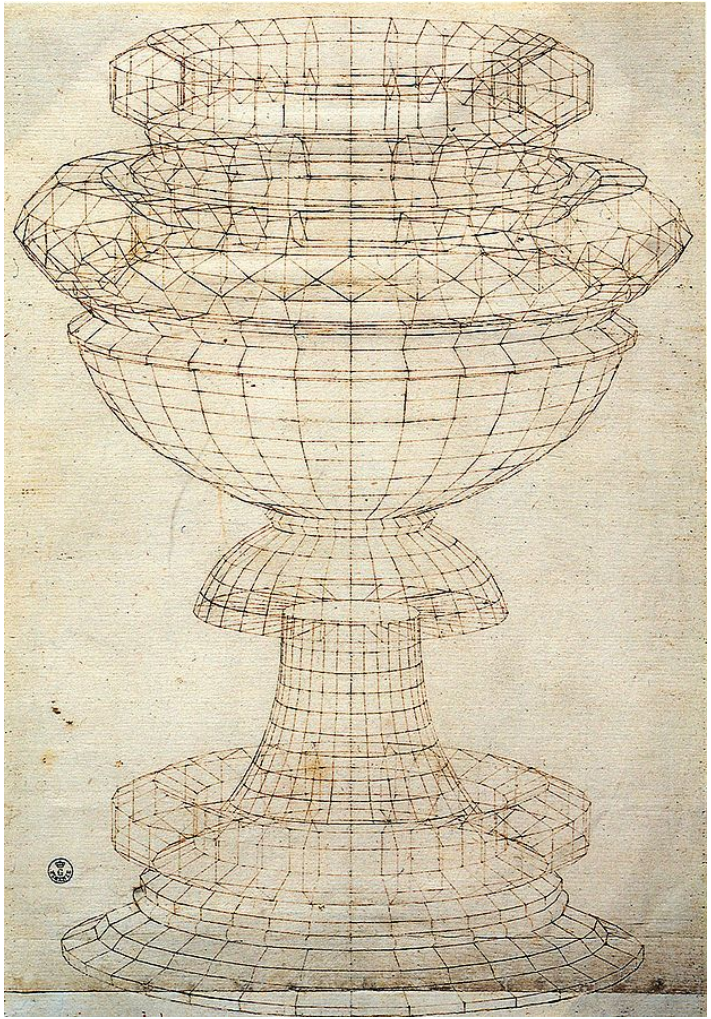


Linea giacente di nove braccia

AB *Pilastri o muri alti dieci braccia*



CONCLUSION

Mathematics can be considered an art, as it allows us to understand the mysteries of nature and grasp laws. It is a vast work of art that has captivated artists like Pythagoras, Mozart, Issar, Vinci, and others. The beauty of mathematics is evident in every point of the universe, and its logic can explain the beauty of art. Galileo's quote highlights the importance of understanding the language of mathematics, which contains geometric figures like triangles and circles, which are essential for comprehending the universe.


Thank You!