Department of Mathematics PPT Presentation

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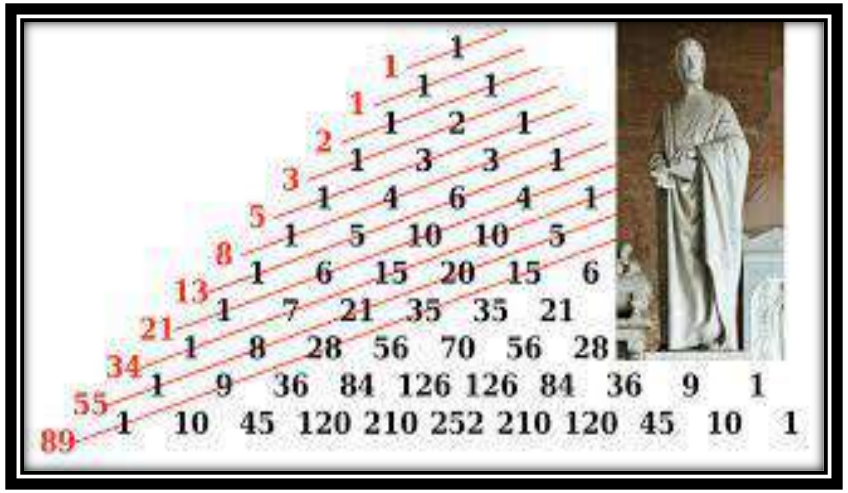
Topic :-Fibonacci sequence



What is the Fibonacci sequence:

- **Fibonacci sequence is a sequence where its first two terms are 0,1 and each term, thereafter, is obtain by adding the two preceding terms.**
- **Fibonacci sequence :-**

0, 1,1,2,3,5,8,13,.....

0+1=1 3+2=5

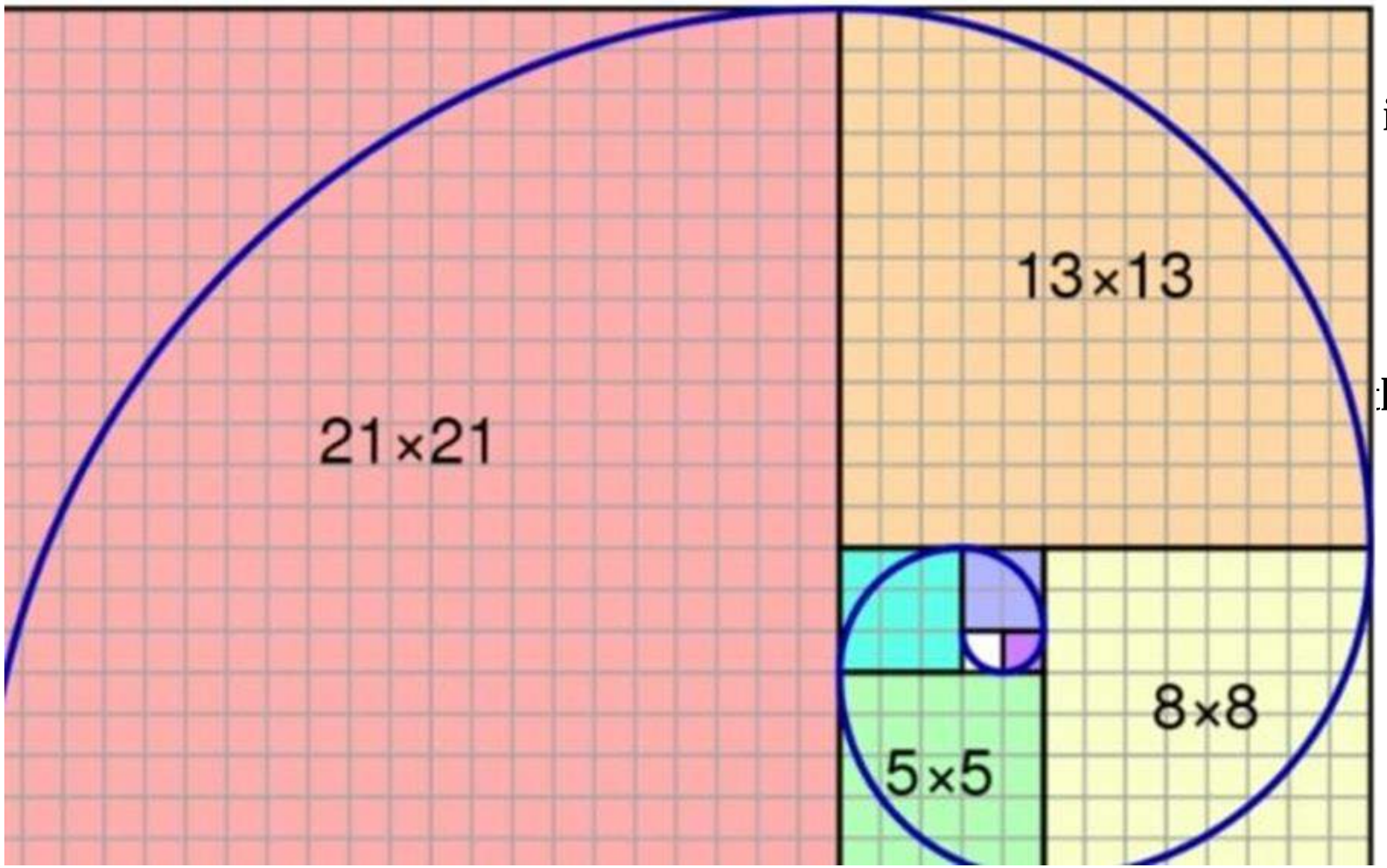
1+1=2 5+3=8

1+2=3 8+5=13.....

We denote 0,1,1,2,3,5.....

F0, f1, f2, f3, f4, f5.... Respectively

Fibonacci spiral:

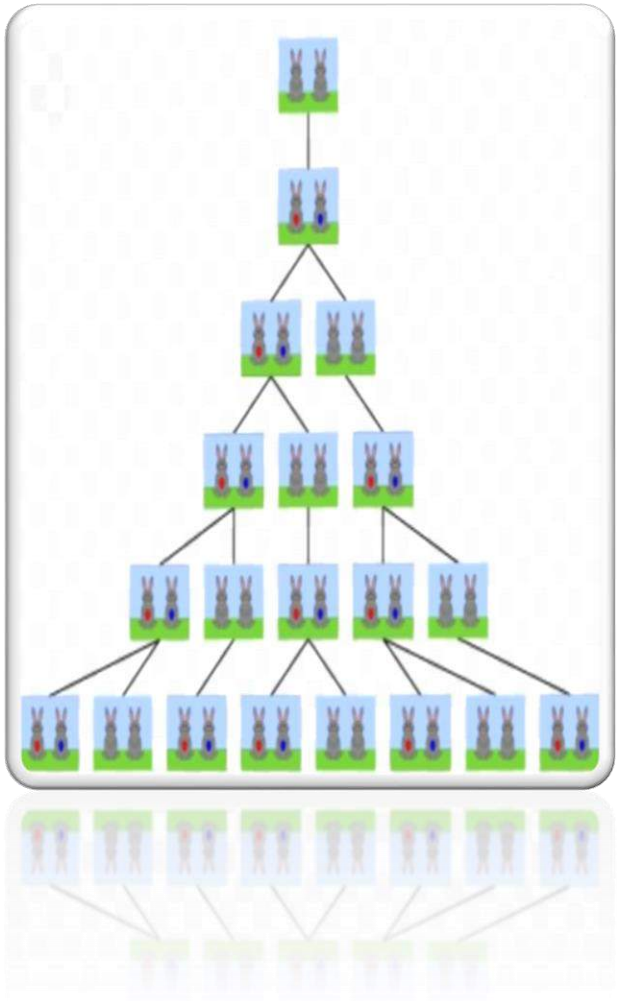
- 

in the
-
- he corners

Fibonacci sequence discovery

- **Leonard Pisano Fibonacci (1170-1250) was an Italian mathematician who is know for discovering the self –named Fibonacci sequence when presented with a problem and spreading the hindu-arabic number system through his book “liberal abaci”**

How discovered Fibonacci sequence

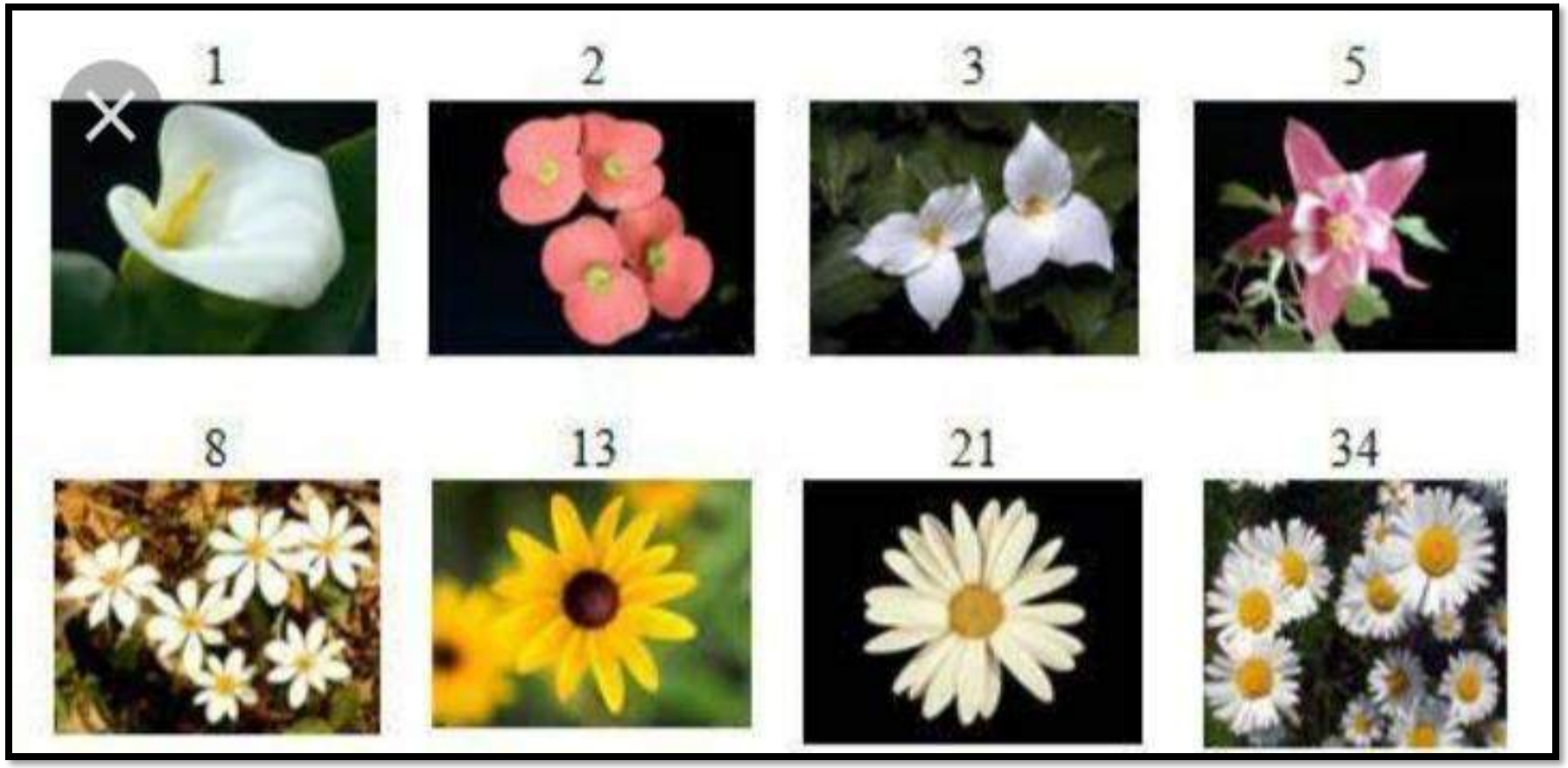


Problem:- A newly born pair of rabbits one male, one Female, are put in a field rabbits are able to mate at the age of one month so that at the end of its second month a female con produce another pair of rabbits. Suppose that the rabbits never die and that the female always produces one new breeding pair every month from the second month on ... How many pairs will there be in one year?

Application of Fibonacci

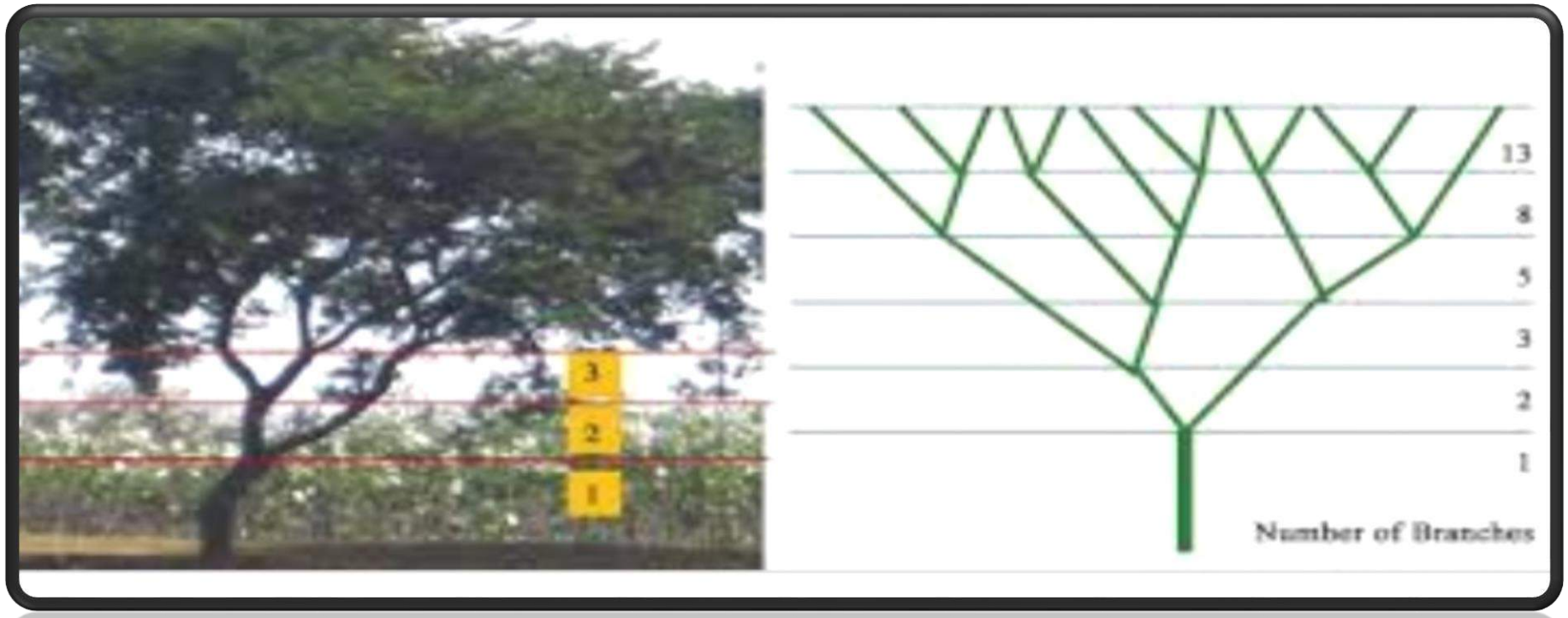
- The are most often applied within computer as search algorithm
- They can also occur naturally , the stems of leaves, the branching tree, the flowering of artichoke.
- The uncoiling fern, the way a pine cones bracts arranged
- Economics uses the sequence very frequently but so do optics
- The system of sunflower artichokes and galaxies.
- Music uses the golden ratio and sequence.

Nature Fibonacci sequence



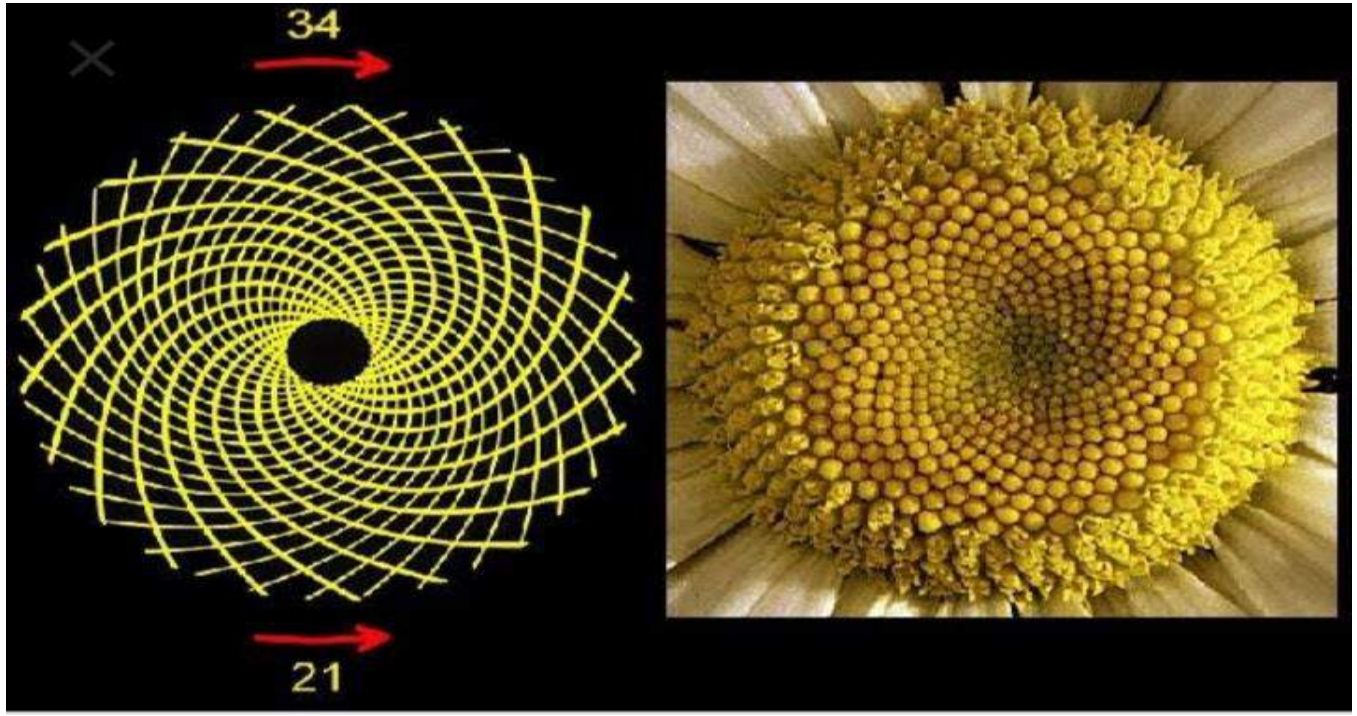
The flowers petals are Fibonacci sequence....

1, 2,3,5,8 , 13,21,34.....

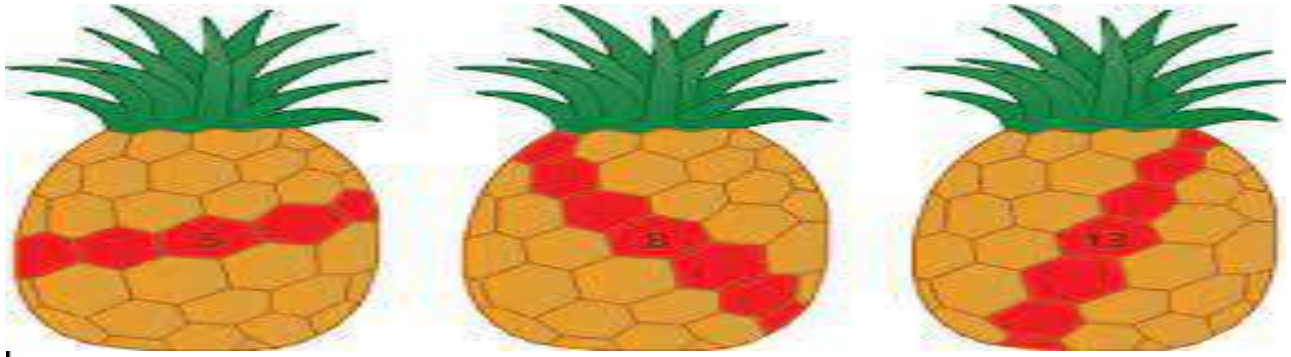


- **Branches are Fibonacci sequence**

Sunflower artichoke Fibonacci sequence



In fruits Fibonacci sequence



Many fruits and vegetables display Fibonacci numbers

Banana 3

Apple 5

Conclusion

We think that this sequence is amazing because Fibonacci discovered it is every where, wherever we see things that have the Fibonacci sequence.

It is used to this day and people are finding new ways of applying his success to calculate their bets.

THANK YOU

ARMED FORCES PREPARATORY

DEGREE COLLEGE FOR WOMEN

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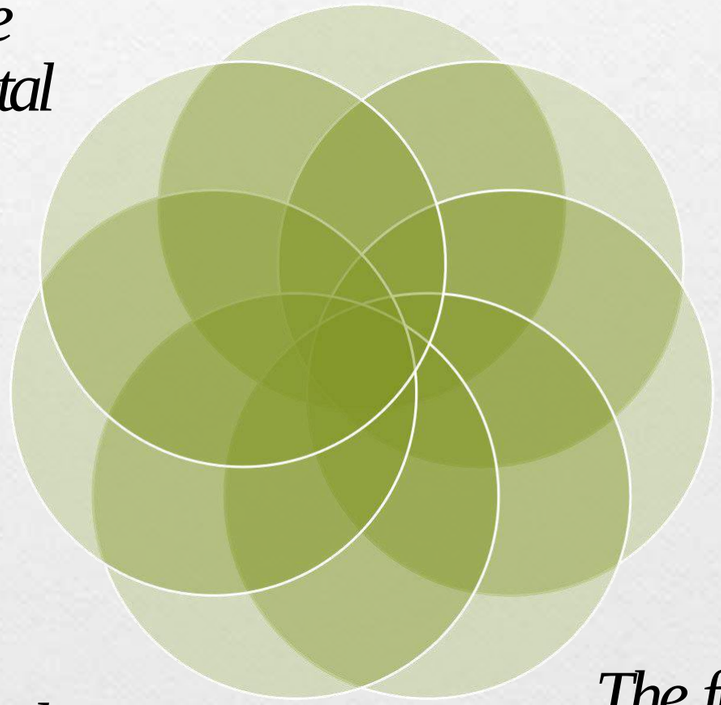
*THE IMPACT OF **ABACUS LEARNING** OF MENTAL ARITHMETIC ON **COGNITIVE ABILITIES** OF CHILDREN*

NEED FOR MATHEMATICS

In these days of increasing innovations in the fields of technological development

Mathematic exploration and practice will give confidence in one`s metal faculties,

And also in day-to-day life, there is a considerable amount of dependence on



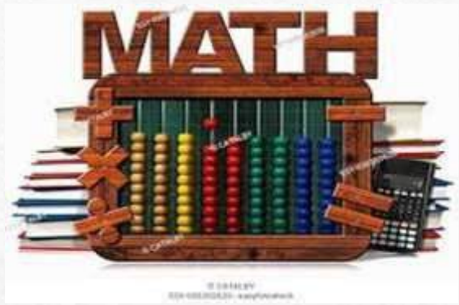
Understanding mathematics fasters an ability to think laterally. Constant

Maths which is the basis of all such developments.

In nature and every one of us uses them in day-to-day life.

The fundamental process of addition, subtraction and counting are all mathematical

OBJECTIVES



To train and instil in children

- *the habit of careful observation*
- *the habit of using multiple skills simultaneously with max efficiency & min economy*
- *to do calculations by using fingers of both hands to stimuli both the right & left brain.*

Right brain stimulation develops the skills of brain such as visualization, imagination, creativity and other skills

Left brain and right brain co-ordinated working results in whole brain development

History and Development of Abacus

The earliest instruments for counting :

1. Stones

2. Slender tree branches

3. Tying knots and

4. Carving.

BENEFITS

- ***Primary Benefit:*** *Greater ability in calculating compared to those without knowledge of abacus & mental arithmetic.*
- ***Secondary Benefits:***

a) *It is simple to use & helps child visualize the math & helps develop mental calculations*

b) *It helps the child to solve problems even faster than a modern electric gadget & improves concentration & imagination.*

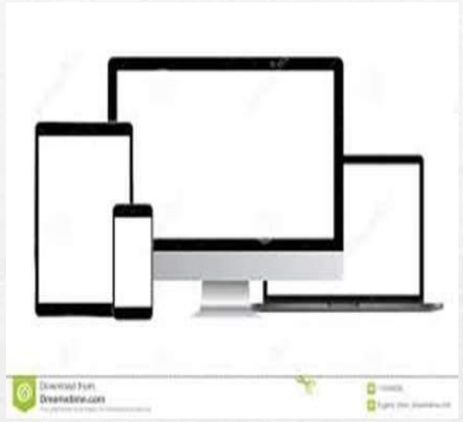
c) *It removes phobia of maths, helps in self-confidence & improve overall abilities.*

d) *The main benefit & result of abacus is concentration improvement & brain development through the concept of visualization.*

ABACUS LEARNING IMPROVE'S MEMORY POWER

- *Mental calculation can be classified into 2 groups:*
  - *One is the "**ABACUS METHOD**" that uses the right brain*
    - *In this method, answers are stored in the long-term memory as images.*
  - *The other is the "**MATHEMATICAL METHOD**" that uses the left brain.*
    - *The Mathematical method is commonly utilized for examinations only uses the short-term memory.*
- *There seems to be no wonder that 80% of the students at the university of Tokyo and Kyoto are toppers who have learned the abacus.*
- *People who start this training while still young are more likely to acquire this "**BRAIN POWER**".*

EXAMPLE: Comparing a modern electric gadget with an abacus learner



INPUT: By the child

PROCESS: Internal

OUTPUT :Display

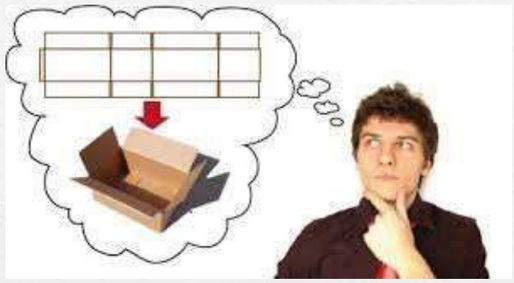
INPUT: By the child

PROCESS: Done by the child

OUTPUT: By the child

SKILLS IMPROVES OF LEARNING ABACUS

- *VISUALIZATION*
- *CONCENTRATION*
- *LISTENING*
- *IMAGINATION*
- *SELF-CONFIDENCE*
- *REMOVAL OF FEAR OF MATHEMATICS*



SUMMARY

Abacus education, not only improves computation capability & interest in Mathematics, but it also helps to improve the over-all Academic Skills & helps to tackle the Day-to-Day life challenges

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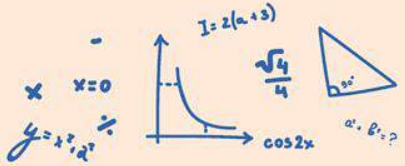
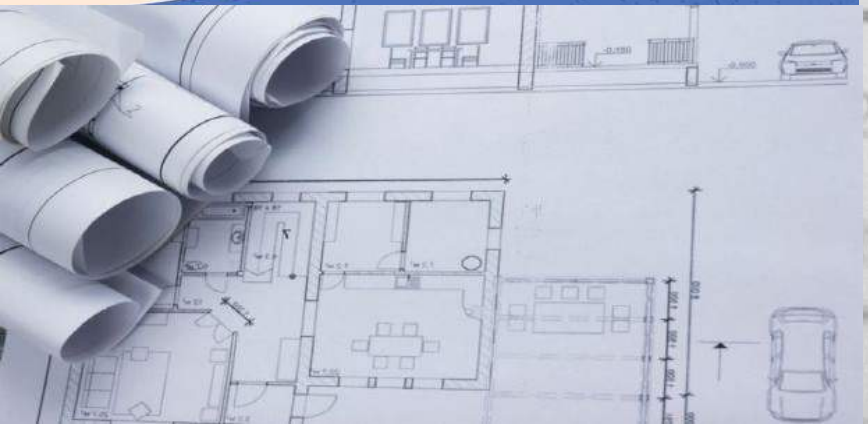


MATHEMATICS IN ARCHITECTURE

Before construction workers can build a habitable structure an architect has to design a plan

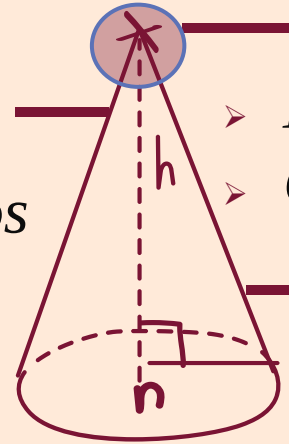


Why architects Need Math?

Architects need math and do math, but their applications are just quite a bit different, maybe unique.

Adjust Proportions

- *Proportions are ratios between numbers.*
- *Golden ratio is applied ie.1:1.61…*



Convert Units

- *Deals with areas & heights*
- *Convert measurements*

Figure Out Scale

- *First design assignment*
- *Draws a plan in a scale of 1:x*

CLASSIFICATION OF ARCHITECTURE

- GREEK
- ISLAMIC
- EGYPTIAN
- INDIAN
- MODERN

Ancient Greek Architecture

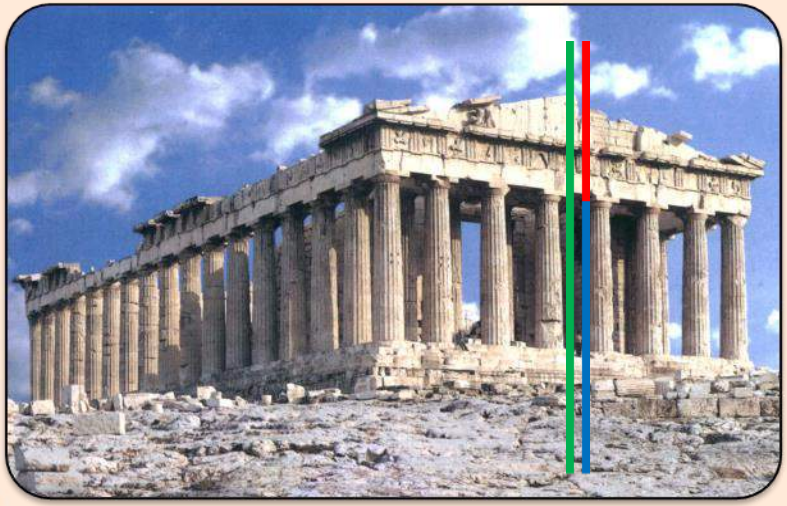
Greek Architecture

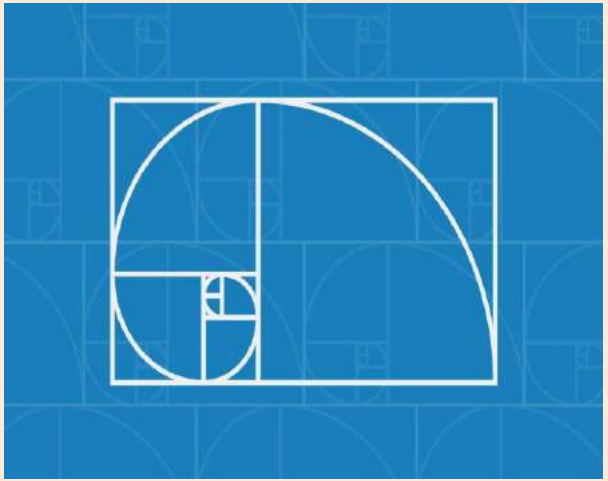
Greek buildings are constructed with the help of Mathematics

- *Golden Ratio*
- *Pythagoras Principle*
- *Cartesian Coordinate system*
- *Simplicity*
- *Perspective*
- *Harmony*

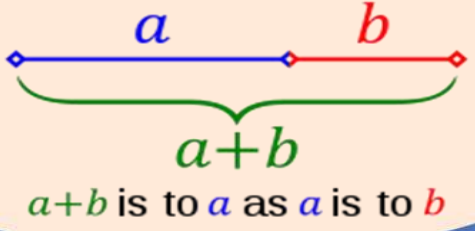
Greek architecture is influenced architects of Rome.

Parthenon in Athens, Golden Ratio

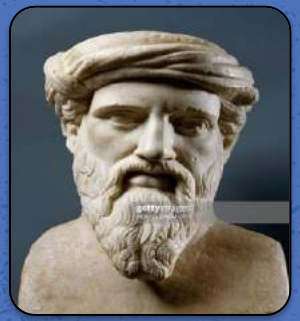


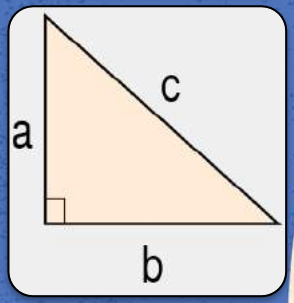


Golden ratio is (a+b):a or a:b which is 1:Φ i.e. 1.618....

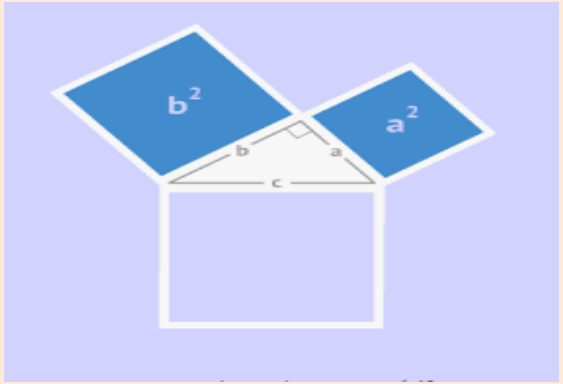


$a+b$ is to a as a is to b

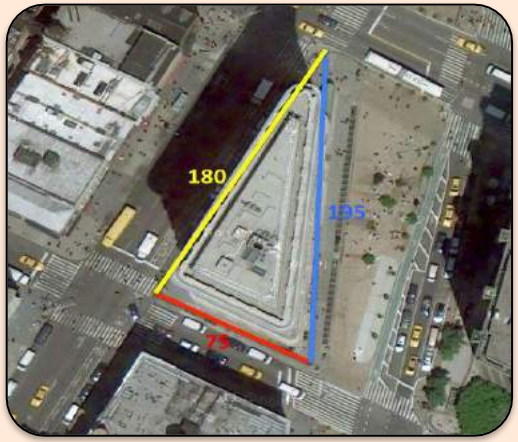




PYTHAGOREAN THEOREM



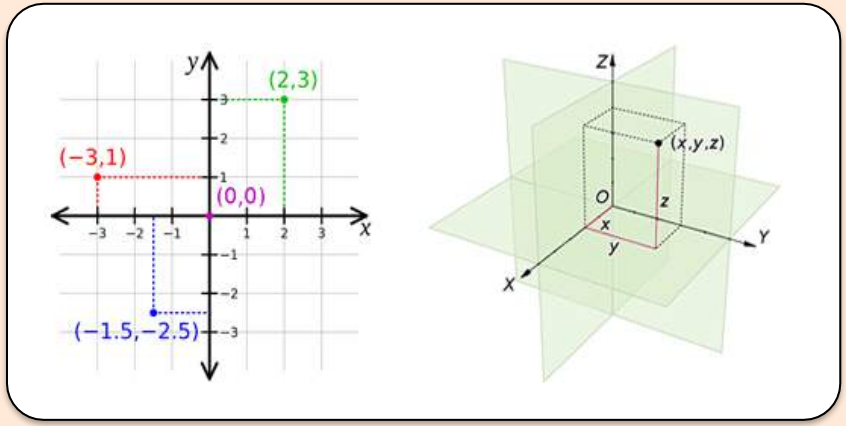
$$a^2 + b^2 = c^2$$

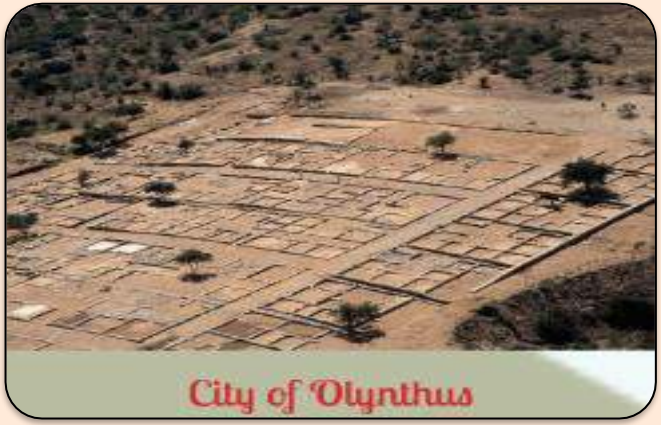


The Pythagorean theorem can be used almost any time working with measurements.

The Pythagorean theorem can be used to build staircases, roofs, & Can even be used to calculate the angle for safely placing a ladder when you need to work in high areas.

Cartesian Coordinate System





Uses plotted points & graph lines

Horizontal => x

Vertical => y

Graphed points are represented by a pair of numbers (x,y)

3 Forms Of Architectural Systems

Doric - *Very sturdy & plain, was used in mainland Greece & colonies in Italy & Sicily.*

Ionic - *Compared to Doric it is thin & more elegant the capital is designed like a scroll with its ends rolled up, it was found in eastern Greece & in islands.*

Corinthian- *It is often used in the Greek world but is also seen in roman temples, its capital is very detailed with acanthus leaves.*

CORINTHIAN ORDER

DORIC ORDER

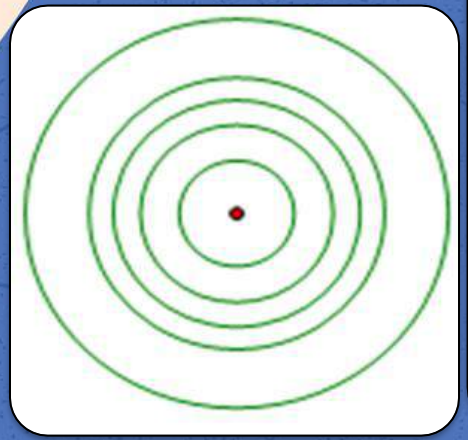
Lincoln Memorial

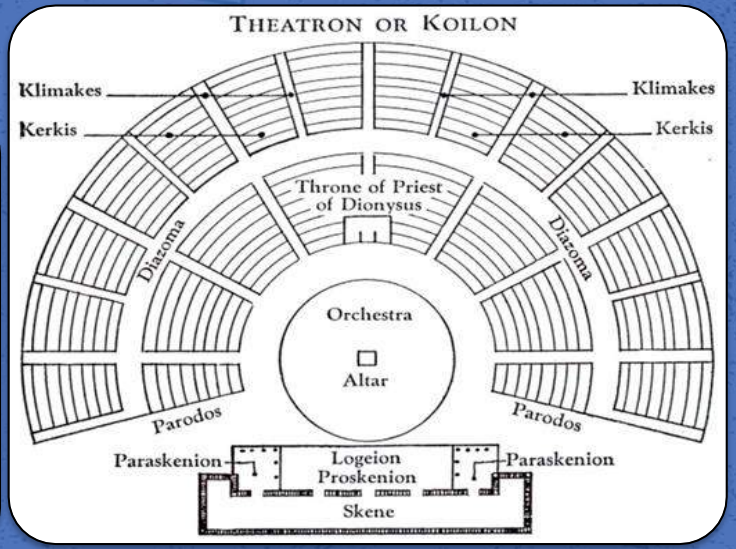
LONIC ORDER

Temple of Zeus

Greek Theatre

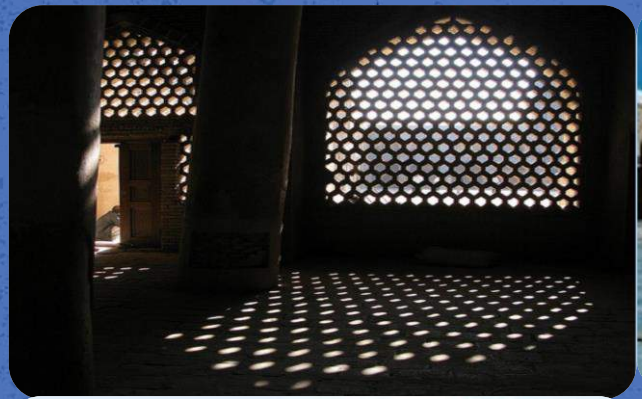
Theatre of koilon



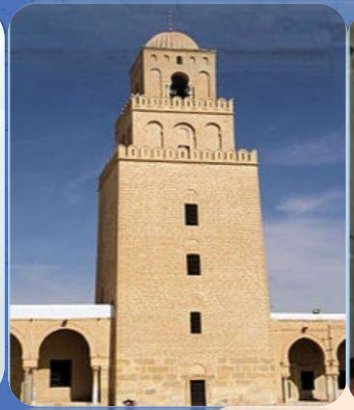


Greek theater is composed of the seating area , a circular space for the chorus to perform (orchestra), and the stage (skene).

ISLAMIC ARCHITECTURE

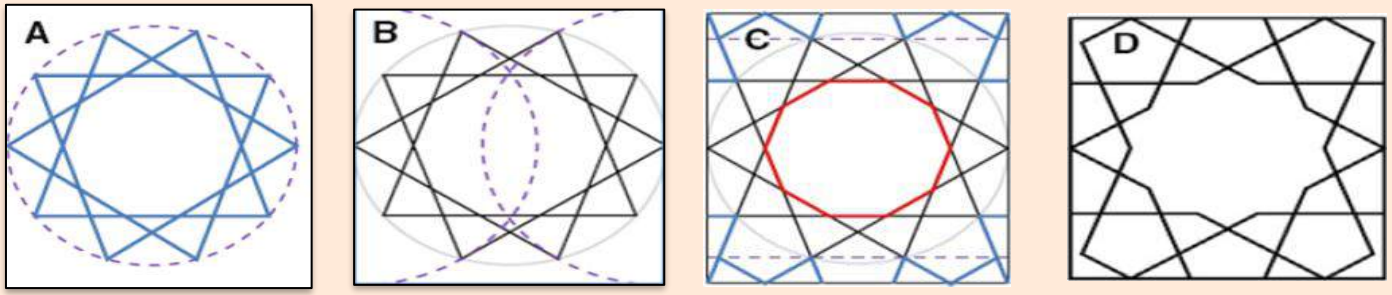






The ratio of most Islamic Architectures is 1:√2

- *The Islamic philosophers had learned about geometry & its shapes.*

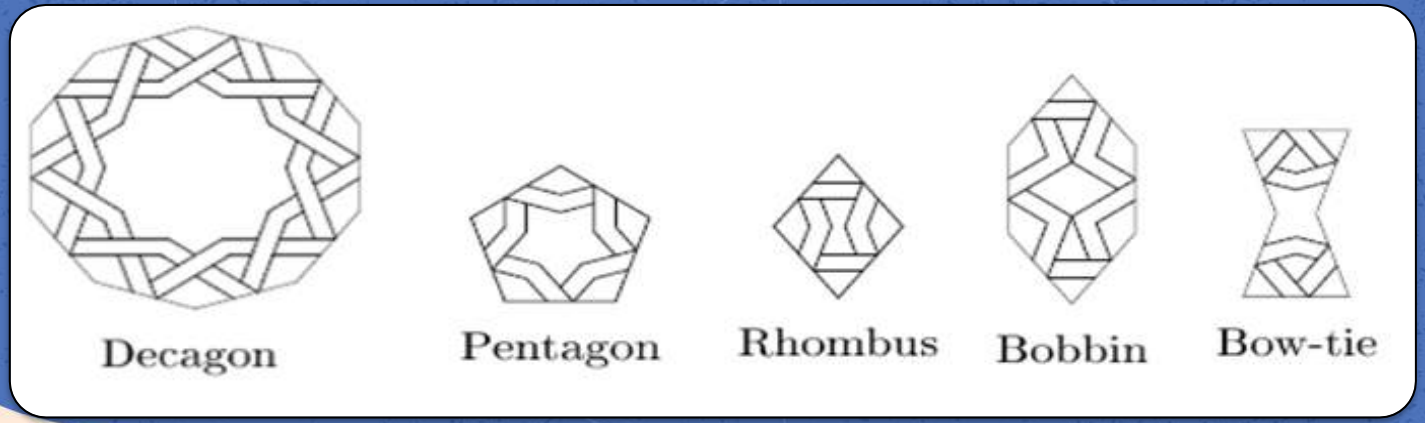


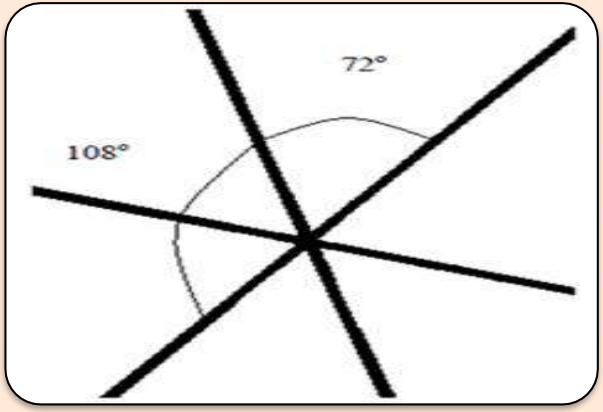
- *The plan was a square and the elevation was obtained by projecting from the diagonal of the plan.*

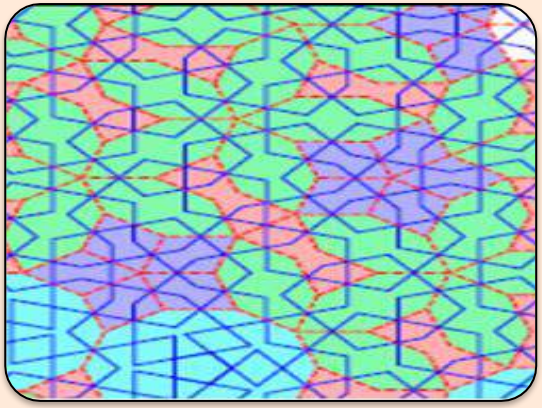
- *Islamic buildings are often decorated with tiling pattern which typically make use of several mathematical Principles.*

A tessellation is created when a shape is repeated over and over again covering a plane without any gaps or overlaps using a set of five tile types, which are called "girih tiles."

Girih Tiling





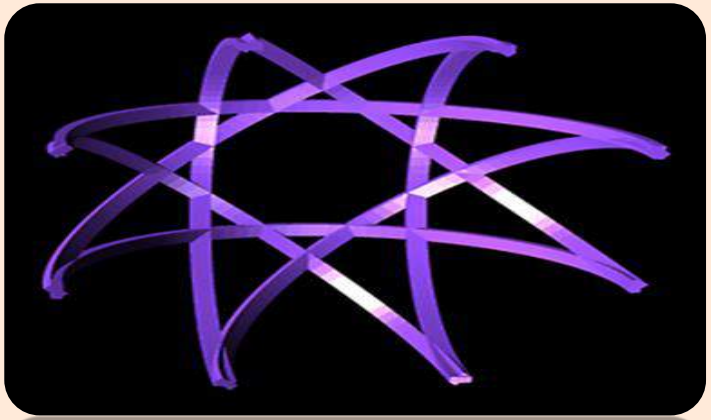


- *In girih tiling the edge of each of the five tiles are the same length.*
- *The girih tiles also have decorating lines incorporated into them.*
- *Each of these decorating lines intersect the mid-point of every edge at 72 and 108 degreed angles.*

Interior Angles in Girih Tilings

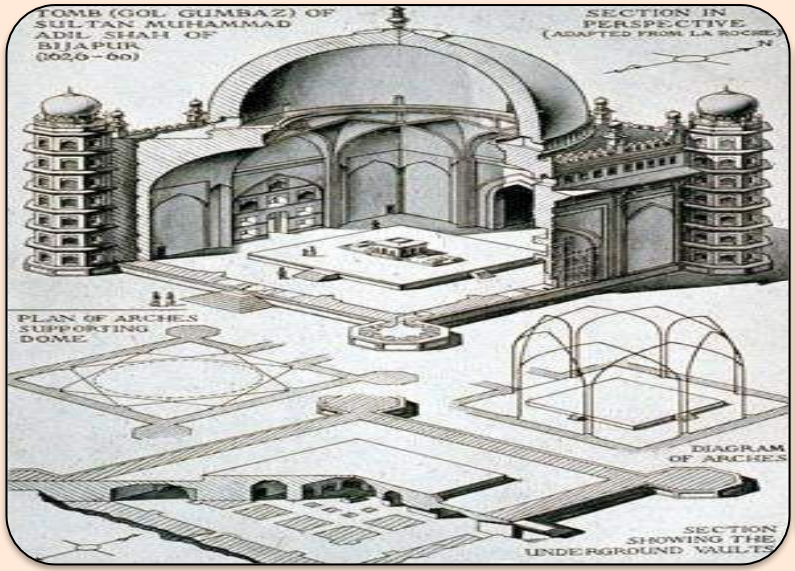
- *A regular **decagon** with ten interior angles of 144°.*
- *A **bow tie** (non-convex hexagon) with interior angles of 72°, 72°, 216°,72°, 72°, 216°.*
- *An elongated (irregular convex) **hexagon** with interior angles of 72°, 144°, 144°, 72°, 144°, 144°.*
- *A **rhombus** with interior angles of 72°, 108°, 72°,108°; & regular **pentagon** with five interior angles of 108°.*

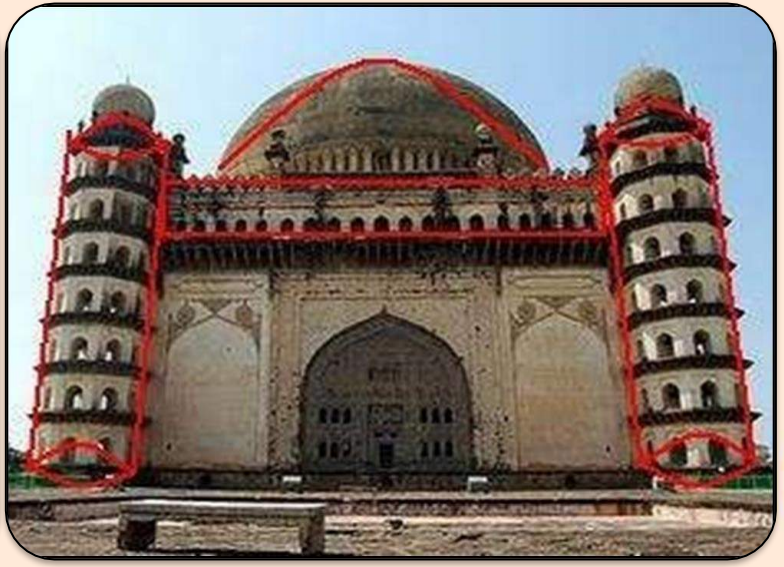
The star ribbed domes eventually progressed until there could be up to 12, 16, 24, 32, 48, or 64 rotations in one dome.



Star ribbed Balanced proportions, dynamic appearance, & the relationship to both the circle & square at the same time.

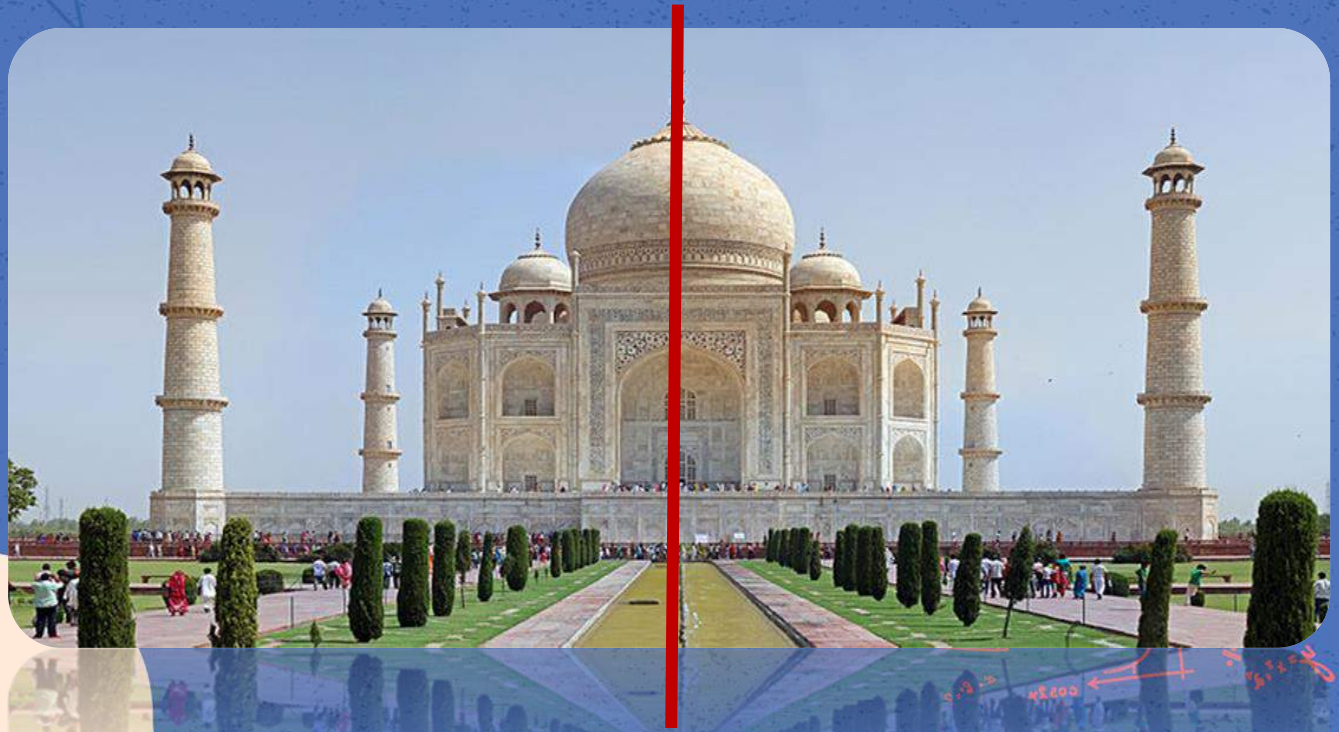
GOL GUMBAZ



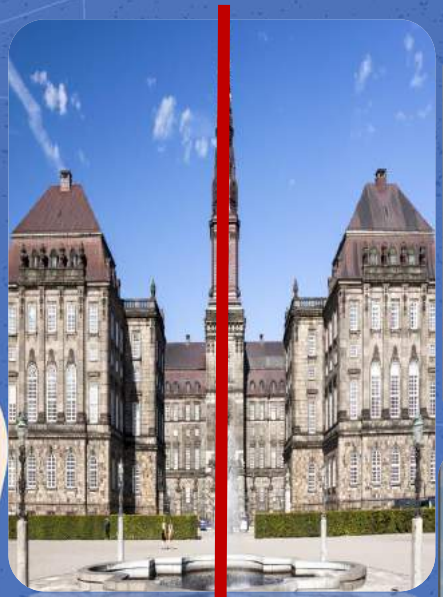


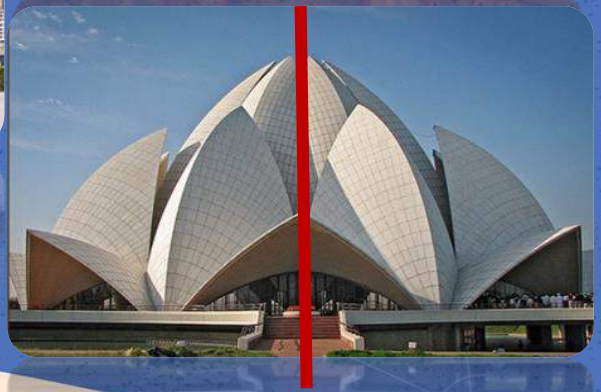
Externally, the building is a great cube with a turret or tower attached to each angle, with a large hemispherical dome covering the whole.

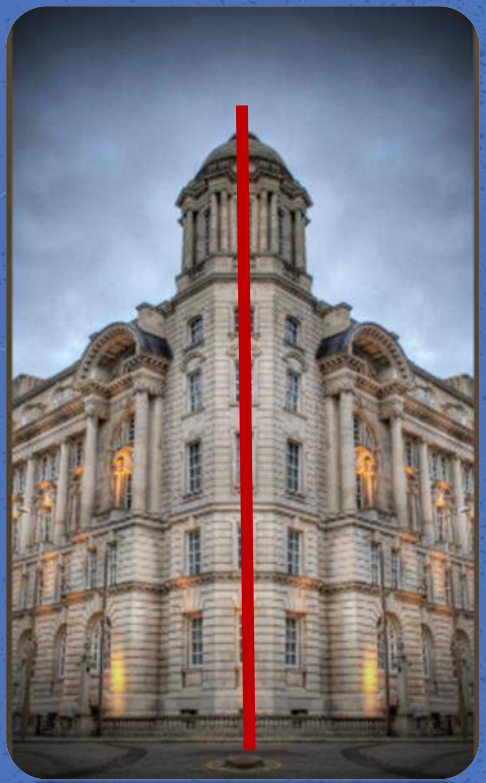
Taj Mahal, mausoleum, India, reflection symmetry



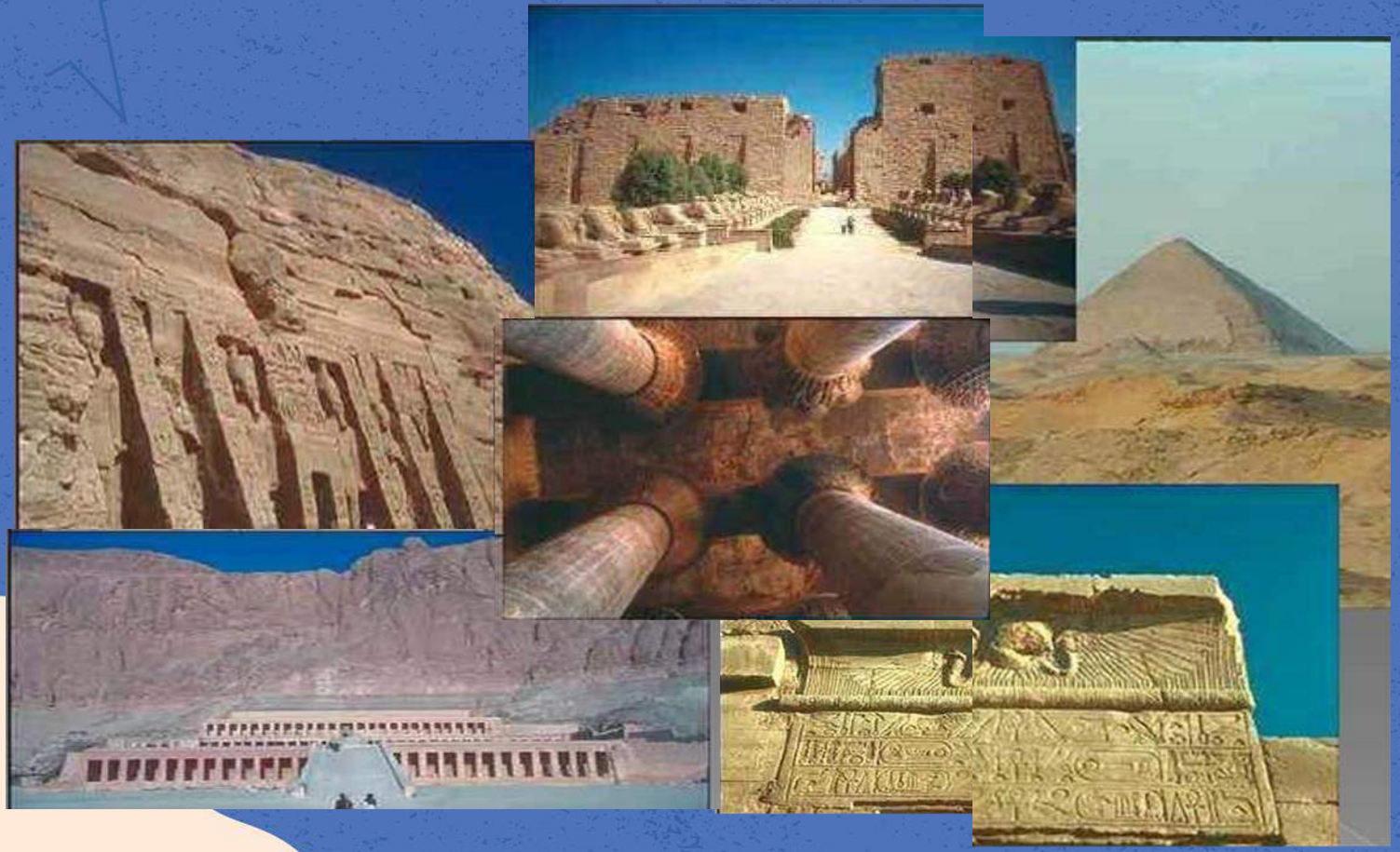
Symmetry in Architecture

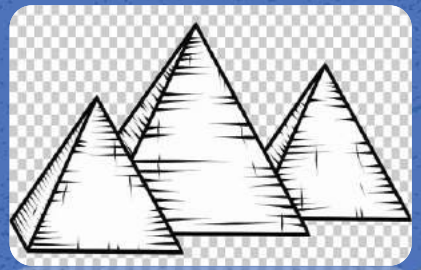


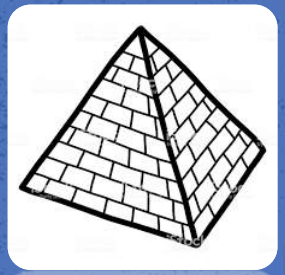




EGYPTIAN ARCHITECTURE

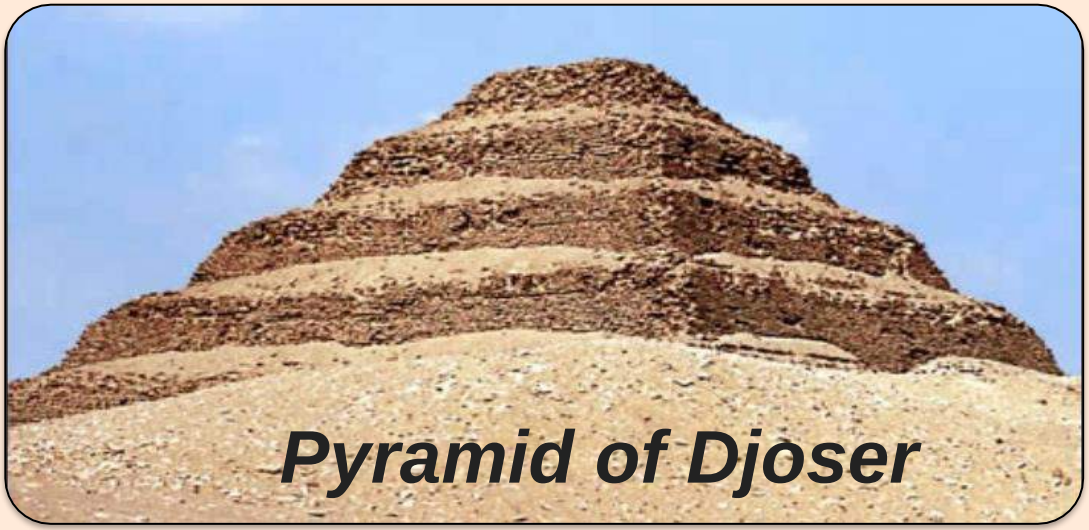




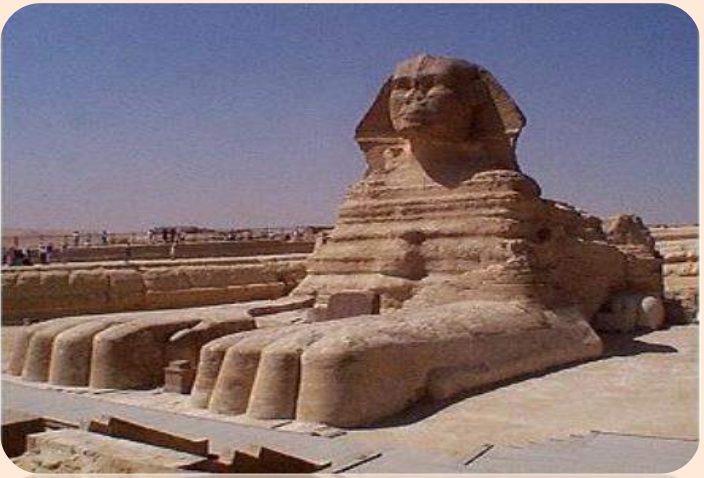


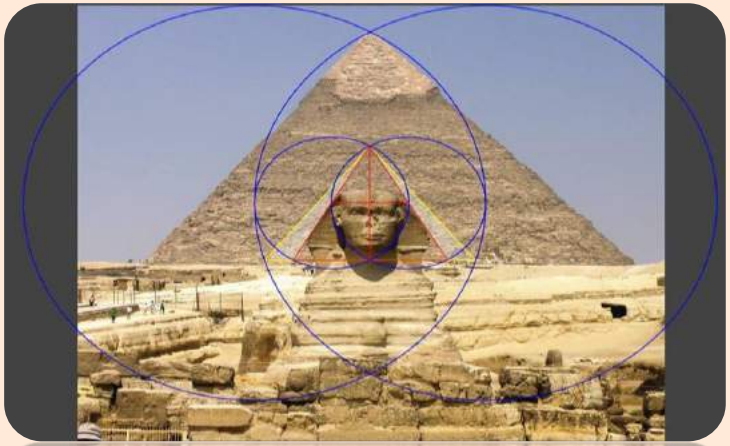
One of the most famous structures in all of Egypt is the pyramid

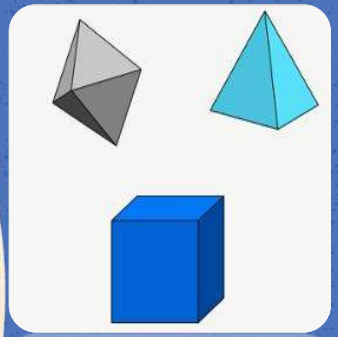
This was the 1st type of pyramid & is called as step pyramid

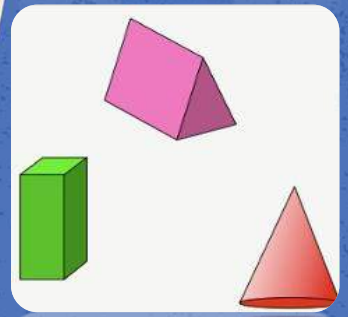


The sphinx is a mixture.
It has the head of a king that is wearing a head cloth, and it has the body of a lion.









*It measures **20.22 meters in height, 19.3 meters in width** and **73.5 meters in length.***

Pyramids of Giza

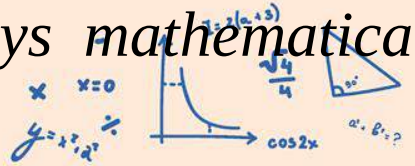
- *The Egyptians used both Pi (Π) and Phi (Φ) in the design of the Great Pyramids.*
- *The perimeter of the pyramid of Egypt(1760cubits) is divided by its height (280cubits) we get 6.28571429 which is ~ 2π.*

INDIAN ARCHITECTURE

It follows the Astrology in Mathematics

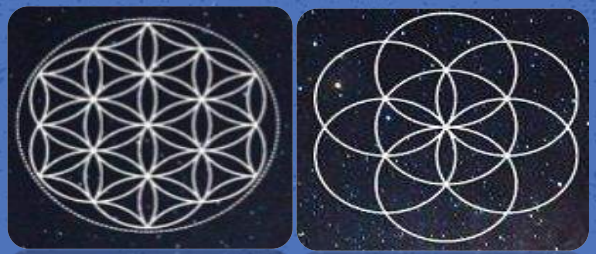
Vaastu Shastra

- *From the vedic period onwards Indian architecture was based on mathematics.*
- *Indian architecture followed the principles of the vastu Shastra which was based on mathematic calculations.*
- *Vaastu Shastra , the ancient Indian canons of architecture & town planning employs mathematical drawings called mandalas.*



MANDALAS

Mandalas are geometric patterns, which mean circle in Sanskrit. The basic form of mandalas is a square with four gates with a circle with a center point yantras are also mandalas.



The mandala is put to use in site planning and architecture through a process called the Pada Vinyasa. This is a method whereby any site can be divided into grids/ modules or pada.

Mandala Types & Properties

Sites are known by the number of squares.

They range from 1x1 to 32x32 (1024) square sites.

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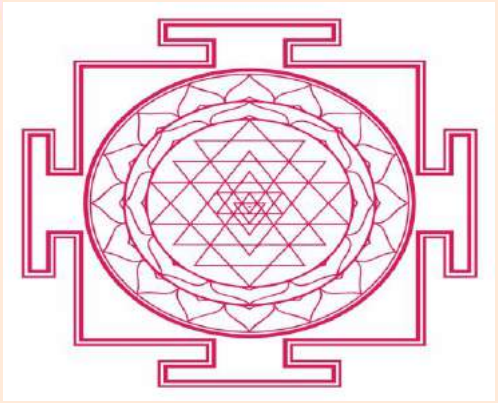
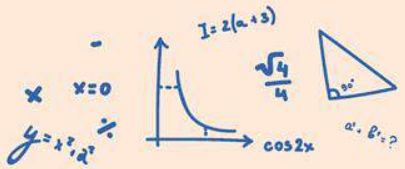


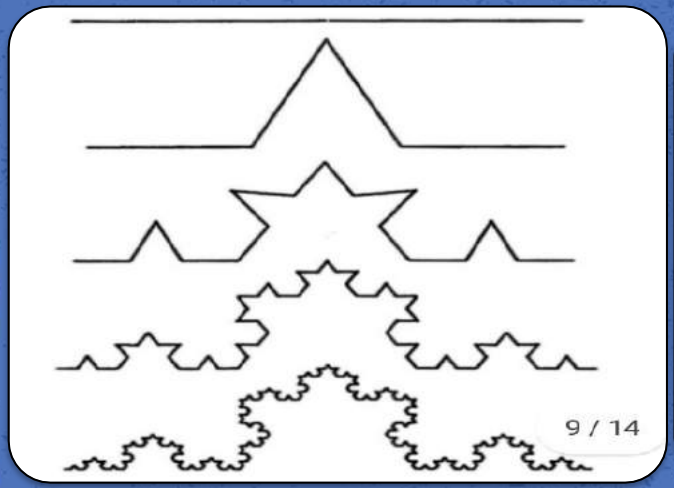
Ugrapitha - 36 squares & 6 divided sites
Sthandila - 49 squares & 7
Chandita - 64 square & 8
Paramasaayika - 81 squares & 9
Aasana - 100 squares & 10
Bhadrmahasan -196 squares & 14

Sakala - 1 square & 1 divided sites
Pechaka - 4 squares & 2
Pitha - 9 squares & 3
Mahaapitha -16 squares & 4
Upapitha - 25 square & 5



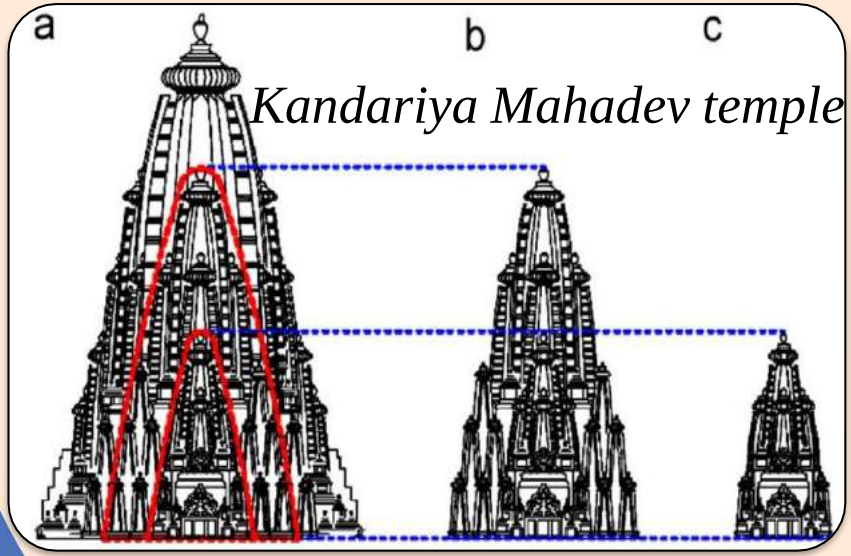
Fractal Geometry

A fractal is a never-ending pattern, created by repeating a similar process over & over in an ongoing feedback loop.



The above geometric shapes known as Tessellations.

Symbolism of Fractal Geometry in Hindu temple Architecture



Kandariya Mahadev temple

(a) whole body of Shikhara above the sanctuary

(b) Self similar part of the whole Shikhara &

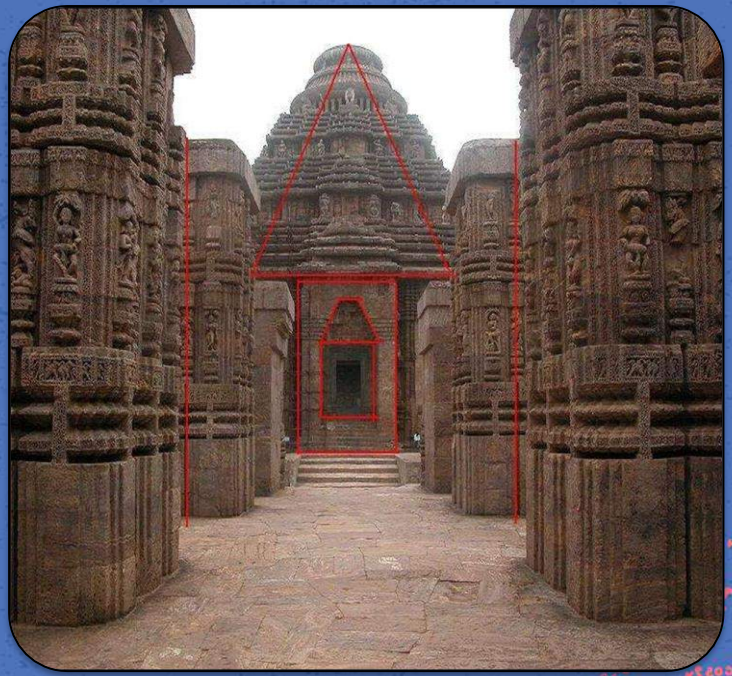
(c) Self similar smaller part of the whole Shikhara

TEMPLES

Brihadeshwara temple

An isosceles triangle

Konark sun temple

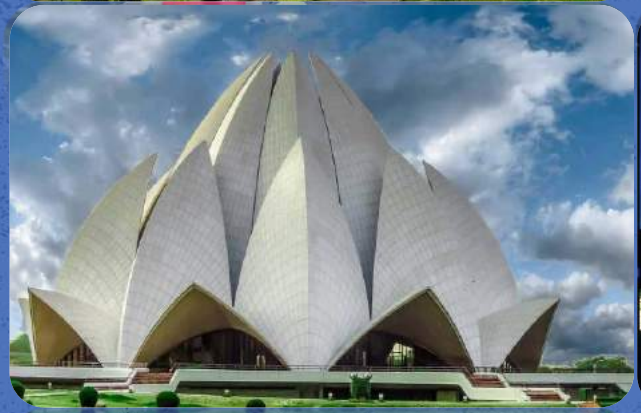


Geometric shapes

Sri Rangam Rajagopuram

A temple is more or less a Trapezium

MODERN ARCHITECTURE



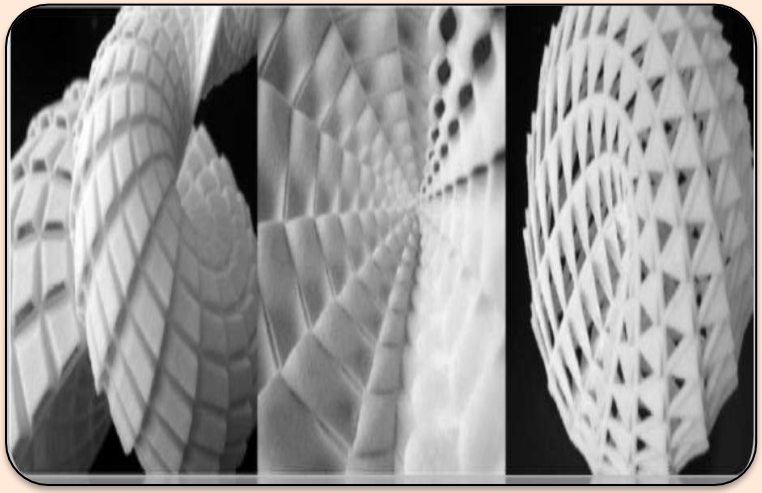
Modern architecture, or Modernist architecture, was based upon new and innovative technologies of construction, particularly the use of glass steel & reinforced concrete; the idea that form should follow function; an embrace of minimalism; & a rejection of ornament.

THE 1st MODERN BUILDING

The first modern architecture building is the crystal palace built in 1850s & it revolutionized the culture of buildings & it is know as the 1st modern building due to large use of steel & glass.

A hexahedron with 6 equal faces

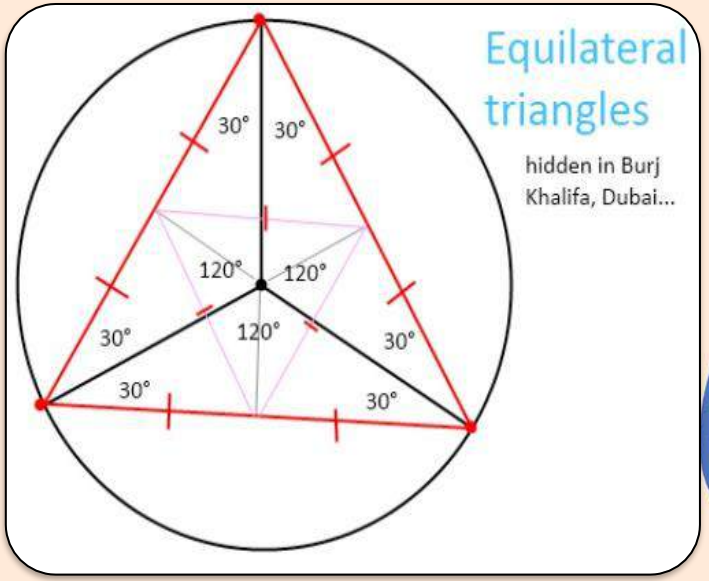
The Gherkin



Mathematical surfaces populated with panels

Standing 591-feet tall, with 41 floors is London's skyscraper known as The Gherkin

Burj Khalifa

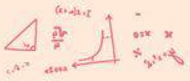


CN Tower in Toronto

- *The tallest tower & freestanding structure in the world, also contains the golden ratio in its design.*
- *The ratio of observation deck at 342 meters to the total height of 553.33 is 0.618 or (the reciprocal of Phi).*

CONCLUSION

- So, as we all see math is a very important part of being an architect.
- This connects to the big idea systems influences humans & how they live.
- Mathematics is something that is found in every thing



MATH IS EVERYWHERE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THANK YOU