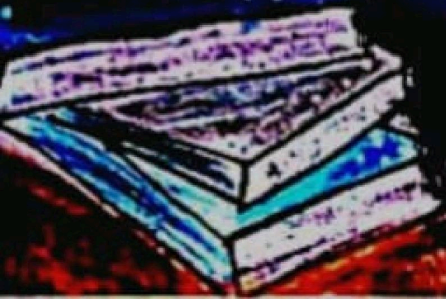


BSC MATHEMATICS 2020-2023

# MINDSPARK

Keep your face towards  
SUNSHINE and the  
shadows will fall behind  
you"



MAHATMA GANDHI COLLEGE

EDITORS:

U.VARADA

AMAL.P

CREATIVE HEAD:

JIJIL VK

MASTHEAD DESIGNER:

VARSHA TOM





# From the Principal's Desk



It gives me great pleasure to write a few words for this handwritten magazine **MINDSPARK**. I hope, just as our mother earth gives us more and more, this magazine will enable our learners to give and get a little more learning. I congratulate the editorial board on its tireless efforts in this pandemic scenario, in bringing out this magazine for all. I also appreciate every student who shared the joy of participation in this venture.

I wish all success to the new students to the college and hope that their years in this institution will be fruitful and knowledgeable.

Happy Reading!

Dr Ajitha V  
Principal

25.08.2021

# Message from Head of the Dept



I feel very happy and proud to see the beautiful and informative handwritten magazine **MINDSPARK** prepared and edited by students of our department.

*Success comes to those who work hard and stay with those who don't rest on the laurels of the past.*

Let's learn and work together to reach our goals.

Happy Reading!

25.08.2021

Dr Bijumon R  
Head, P.G. Dept. of Mathematics



## Message from the editor

Collateral learning in the way of formation of enduring attitudes is more important. It is with immense pride and pleasure we the students of Mathematics department of Mahatma Gandhi College present our magazine "MINDSPARK : 2020-23 ". This magazine is not the outcome of the efforts put in by an individual but the effort of all students and teachers. By going through this magazine , one gets the glimpse of vibrancy and the various creative pursuits of the students. We apologise for the shortcomings and hope you will cherish our efforts.

-- *Editor*



MATHEMATICS

# THE QUEEN OF SCIENCE

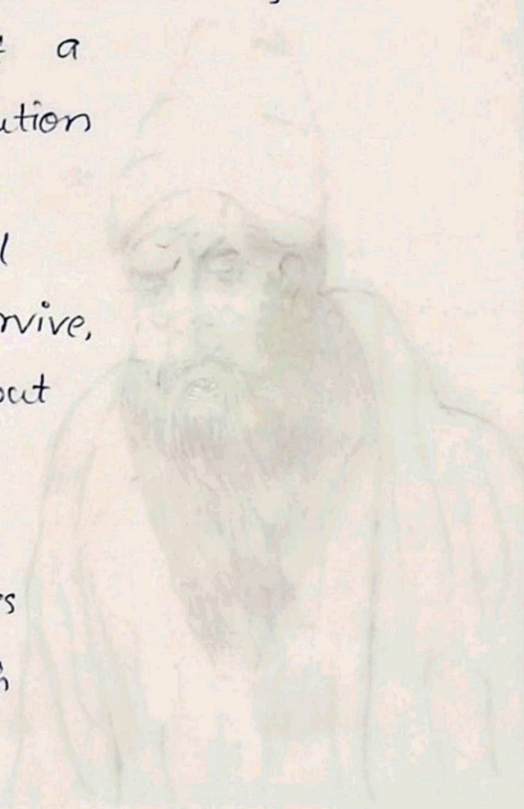
$$3X + 2X$$

$$2X + 1$$

# Euclid

Euclid was one among the famous mathematicians, and he was known as the 'father of Geometry'. His famous Geometry contribution is referred to as the Euclidean geometry, which is there in the Geometry chapter of class 9. He spent all his life working for mathematics and set a revolutionary contribution to Geometry.

Very few original reference to Euclid survive, so little is known about his life. He was likely born c. 325 BC, although the place and circumstances of both his birth and death are unknown and may only be estimated roughly relative to other people mentioned with him. He is mentioned by name, though rarely, by other Greek mathematicians.





from Archimedes (c. 287 BC - c. 212 BC) onward, and is usually referred to as "the author of Elements". The few historical reference to Euclid were written by Proclus c. 450 AD, eight centuries after Euclid lived.

A detailed biography of Euclid is given by Arabian authors, mentioning, for example, a birth town of Tyre. This biography is generally believed to be fictitious. If he came from Alexandria, he would have known the Serapeum of Alexandria, and the Library of Alexandria, and may have worked there during his time. Euclid's Arrival in Alexandria came about ten years after its founding by Alexander the Great, which means he arrived c. 322 BC.

Proclus introduces Euclid only briefly in his commentary on the Elements. According to Proclus, Euclid supposedly belonged to Plato's "persuasion" and brought together the Elements, drawing on prior work of Eudoxus of Cnidus and



of several pupils of Plato (Particularly Theaetetus and Philip of Opus). Proclus believes that Euclid is not much younger than these, and that he must have lived during the time of Ptolemy I (c. 367 BC - 282 BC) because he ~~was~~ was mentioned by Archimedes. Although the apparent citation of Euclid by Archimedes has been judged to be an interpolation by later editors of his works, it is still believed that Euclid wrote his works before Archimedes wrote his. Proclus later retells a story that, when Ptolemy I asked if there was a shorter path to learning geometry than Euclid's Elements, "Euclid replied there is no royal road to geometry." This anecdote is questionable since ~~it~~ it is similar to a story told about Menaechmus and Alexander the Great.

Euclid died c. 270 BC, presumably in Alexandria. In the only other key reference to Euclid, Pappus of Alexandria (c. 320 AD) briefly mentioned that Apollonius "spent



a very long time with the pupils of Euclid at Alexandria, and it was thus that he acquired such a scientific habit of thought" c. 247-222 BC.

Because the lack of biographical information is unusual for the period (extensive biographies being available for most significant Greek mathematicians several centuries before and after Euclid), some researchers have proposed that Euclid was not a historical personage, and that his works were written by a team of mathematicians who took the name Euclid from Euclid of Megara. However, this hypothesis is not well accepted by scholars and there is little evidence in its favor.

Alka Rajeev · P.M

BSc. Mathematics



# PATTERNS IN NATURE

Pattern in nature are visible regularities of forms found in the natural world.

These patterns occur in different contexts and can sometimes be modelled mathematically.

Natural patterns include symmetric, trees, spirals, meanders, waves, foams, tessellations, cracks and stripes.

Early Greek philosophers studied patterns, with Plato, Pythagoras and Empedocles attempting to explain order in nature.

The modern understanding of visible patterns developed gradually over time.

In the 19th century, the Belgian physicist Joseph Plateau exclaimed soap films, leading him to formulate the concept of a minimal surface.

The German biologist and artist Ernst Haeckel painted hundreds of marine organisms to emphasise their symmetry.

Scottish biologist D'Arcy Thompson pioneered the study of growth patterns in both plants and animals, showing that simple equations could explain spiral growth.



In the 20th century, the British mathematician Alan Turing predicted mechanisms of morphogenesis which give rise to patterns of spots and stripes.

The Hungarian biologist Aristid Lindenmayer and the French American mathematician Benoît Mandelbrot showed how the mathematics of fractals could create plant growth patterns.

Mathematics, physics and chemistry can explain patterns in nature at different levels. Patterns in living things are explained by the biological processes of natural selection and sexual selection. Studies of pattern formation make use of computer models to simulate a wide range of patterns.

By :- Hridya . K



# The most beautiful equation

$$e^{i\pi} + 1 = 0$$

"Like a Shakespearean sonnet that captures the very essence of love, or a painting that brings out the beauty of the human form that is far more than just skin deep, Euler's Equation reaches down into the very depths of existence". Stanford mathematician Keith Devlin called it "The Most Beautiful Equation". But why is Euler's formula so breathtaking?

First, the letter "e" represents an irrational number that begins 2.71828... Next, "i" represents the so-called "imaginary number": the square root of negative 1. It is thus called because, in reality, there is no number which can be multiplied by itself to produce a negative number. Pi, the ratio of a circle's circumference to its diameter.

Putting it all together, the constant "e" raised to the power of the imaginary "i" multiplied by pi equals -1, adding 1 to that gives 0. It seems almost unbelievable that all these strange numbers would combine so simply.



# LEONHARD EULER

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Leonhard Euler was born on 15 April, 1707 in Switzerland. He was Swiss mathematician and physicist, one of the founders of pure Mathematics. He not only made decisive and formative contributions to the subjects of Geometry, calculus, Mechanics, and number theory but also developed methods for solving problems in observational astronomy and demonstrated useful applications of Mathematics in technology and public affairs.

Euler's Mathematical ability earned him the esteem of Johann Bernoulli, one of the first Mathematicians in Europe at that time, and of his sons Daniel and Nicolas. In 1727, ~~the~~ He moved to St. Petersburg, where he became an associate of the St. Petersburg Academy of sciences and in 1733 succeeded Daniel Bernoulli to the chair of Mathematics. By means of his numerous books and Memoires that he submitted to the Academy, Euler carried integral calculus to a higher degree of perfection, developed the ~~a~~ theory of trigonometric and logarithmic functions, reduced analytical operations



operations to a greater simplicity, and threw the new light of nearly all parts of pure Maths. overtaxing, Himself, Euler in 1735 lost the sight of one eye. Then, invited ~~the~~ by Frederick the Great in 1741, He became a Member of the Berlin Academy, where for 25 years he produced a steady stream of publications, many of which he contributed to the St. Petersburg Academy, which granted him a pension.

In the 18<sup>th</sup> century, Euler formulated Euler's identity. Euler's identity is the most beautiful of all equations.

In 1748, in his Introduction to Analysis in Infinitum, He developed the concept of function in mathematical analysis, through which variables are related to each other and in which he advanced the use of infinitesimals and infinite quantities. He is known for familiar results in elementary Geometry.

For example,

- ★ The Euler's line through the orthocenter, the circumcenter and the barycenter.

- ★ He was responsible for treating trigonometric functions:

i.e., the relationship of an angle to two sides of a triangle - as numerical ratios as rather than as lengths of geometric lines and for relating them,



through the so called Euler's identity  $[e^{i\theta} = \cos\theta + i\sin\theta]$ , with complex numbers (eg:  $3+2\sqrt{-1}$ ).

★ He discovered the imaginary logarithms of negative numbers and showed that each complex number has an infinite number of logarithms.

★ Euler's textbooks in calculus, *Institutiones calculi differentialis* in 1755 and *Institutiones calculi integralis* in 1768-70 contain formulas of differentiation and numerous methods of infinite integration.

★ He made advances in the theory of linear differential equations, which are useful in solving problems in physics.

★ He introduced many current notations, such as:

- $\Sigma \rightarrow$  for sum.
- The symbol  $e$  for base of natural logarithms,
- $a, b$  and  $c \rightarrow$  for the sides of a triangle. And
- $A, B$  and  $C \rightarrow$  for the opposite angles.
- The letter  $f$  and parenthesis  $\{ \}$   $\rightarrow$  for a Function
- $i \rightarrow$  for  $\sqrt{-1}$ .

He also popularize the use of the symbol ' $\pi$ ' for the ratio of circumference to diameter in a circle.

Euler devoted considerable attention to developing a more perfect theory of Lunar Motion, which was particularly troublesome, since it involves the so-called 'three body problem' - The interaction of Sun, Moon and Earth. (The problem is still unsolved).



His partial solution, published in 1753, assisted the British Admiralty in calculating lunar tables, of importance to them in attempting to determine longitude at sea.

Throughout his life Euler was much absorbed by problems dealing with the theory of numbers, which treats of the properties and relationships of integers, or whole numbers ( $0, \pm 1, \pm 2$ , etc). In this, his greatest discovery, in 1783, was the law of quadratic reciprocity, which has become the essential part of modern number theory.

In his effort to replace synthetic methods by analytic ones, Euler was succeeded by Joseph-Louis Lagrange. Lagrange sought for abstract generalization, and while Euler incautiously manipulated divergent series, Lagrange extended to establish infinite processes upon a sound basis. Thus it is that Euler and Lagrange together are regarded as the greatest mathematicians of the 18th century, but Euler has never been excelled in either in productivity or in the skillful and imaginative use of algorithmic devices for solving problems.

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- Aiswarya.k



## BEAUTY OF MATHEMATICS

$$05 \times 05 = 0 \times 1 \times 100 + 5 \times 5 = 25$$

$$15 \times 15 = 1 \times 2 \times 100 + 5 \times 5 = 225$$

$$25 \times 25 = 2 \times 3 \times 100 + 5 \times 5 = 625$$

$$35 \times 35 = 3 \times 4 \times 100 + 5 \times 5 = 1225$$

$$45 \times 45 = 4 \times 5 \times 100 + 5 \times 5 = 2025$$

$$55 \times 55 = 5 \times 6 \times 100 + 5 \times 5 = 3025$$

$$65 \times 65 = 6 \times 7 \times 100 + 5 \times 5 = 4225$$

$$75 \times 75 = 7 \times 8 \times 100 + 5 \times 5 = 5625$$

$$85 \times 85 = 8 \times 9 \times 100 + 5 \times 5 = 7225$$

$$95 \times 95 = 9 \times 10 \times 100 + 5 \times 5 = 9025$$

$$1 \times 8 + 1 = 9$$

$$12 \times 8 + 2 = 98$$

$$123 \times 8 + 3 = 987$$

$$1234 \times 8 + 4 = 9876$$

$$12345 \times 8 + 5 = 98765$$

$$123456 \times 8 + 6 = 987654$$

$$1234567 \times 8 + 7 = 9876543$$

$$12345678 \times 8 + 8 = 98765432$$

$$123456789 \times 8 + 9 = 987654321$$

VARSHA.P



# THE IMPACT OF MATHEMATICS ON THE MODERN WORLD

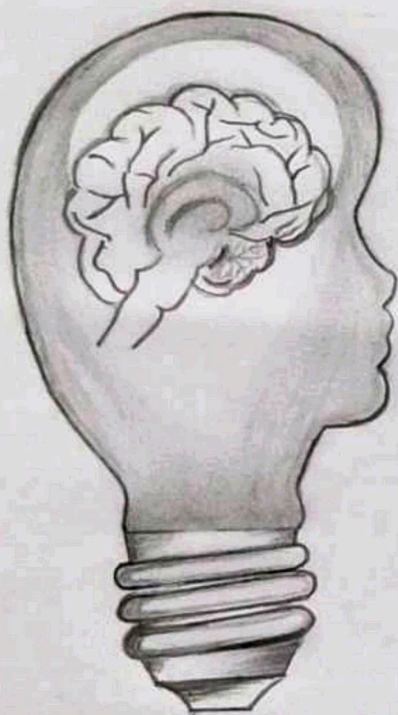
Math. It's one of those things that most people either love or hate. Those who fall on the hate side of things might still have nightmares of showing up for a high school math test unprepared, even years after graduation. Math is, by nature, an abstract subject, and it can be hard to wrap your head around it if you don't have a good teacher to guide you.

But even if you don't count yourself a fan of mathematics, it's hard to argue that it hasn't been a vital factor in our rapid evolution as a society. We reached the moon because of math. Math allowed us to tease out the secrets of DNA, create and transmit electricity over hundreds of miles to power our homes and offices, and gave rise to computers and all that they do for the world. Without math, we'd still be living in caves getting eaten by cave tigers.

Our history is rich with mathematicians who helped advance our collective understanding of math, but there are a few



standouts whose brilliant work and intuitions pushed things in huge leaps and bounds. The list include Isaac Newton, Carl Gauss, John von Neumann and so on. Their thoughts and discoveries continue to echo through the ages, reverberating today in our cellphones, satellites, hula hoops and automobiles. Their work continues to help shape our modern world, sometimes hundreds of years after their death.



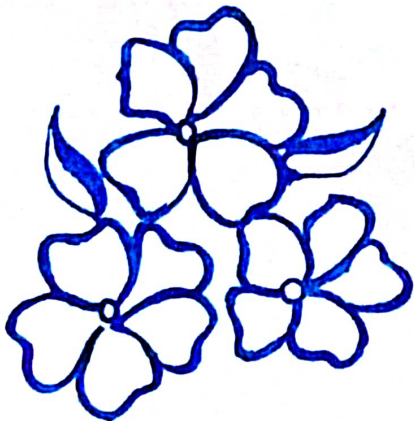
**DID YOU  
KNOW?**

Among all shapes with the same perimeter a circle has the largest area.





**Be Strong**  
**IN THE** Lord  
**AND IN HIS**  
**MIGHTY**  
**Pow'r**



Stephy Joseph





# ARCHIMEDES

Archimedes was, arguably, the world's greatest scientist - certainly the greatest scientist of the classical age.

Archimedes is known as the Father of Mathematics. He was a mathematician, physicist, astronomer, engineer, inventor and weapons designer. As we'll see, he was a man ~~was~~ who was both of his time and far ahead of his time.

Archimedes was born in the Greek city-state of Syracuse on the island of Sicily in approximately 287 BC. His father, Phidias, was an astronomer.



MATHS  
GIVES US  
HOPE  
THAT EVERY  
PROBLEM  
HAS  
A  
Solution



# ABACUS

Abacus is the most ancient device used for calculations. It is mainly used to solve basic arithmetic operations. It has got a unique place in the history of mathematics. Abacus is a Latin word that means "flat surface". The device consists of a wooden frame, rods & beads. Each rod represents a different place value & each bead represents a number. These beads can be moved along rods. Calculations are performed by moving these beads.

Modern abacus has been proved to be a brain development tool that can enhance mental calculating abilities. It improves observation, listening and enhance imagination. It can be instantly made to read zero by a horizontal pull along the center. The Russian abacus is known as the schoty. It is different from other abacuses as it is not divided into disks. The abacus is faster than a calculator in Addition & subtraction.

Stephy Joseph



# Beauty of MATHEMATICS

$$1 \times 1 = 1$$

$$11 \times 11 = 121$$

$$111 \times 111 = 12321$$

$$1111 \times 1111 = 1234321$$

$$11111 \times 11111 = 123454321$$

$$111111 \times 111111 = 12345654321$$

$$1111111 \times 1111111 = 1234567654321$$

$$11111111 \times 11111111 = 123456787654321$$

Amal Joseph



# Madhava of Sangamagrama

Madhava of Sangamagrama was an Indian Mathematician and astronomer from Thrissur District, Kerala, India. He was born in c 1340 BC. He started a school in Kerala called the Kerala school of mathematics and astronomy. He has made significant contributions to the field of mathematics in topics like calculus, geometry, infinite series, algebra, and trigonometry.

He was the first mathematician who has applied the endless series in trigonometric functions like Sine, Cosine, tangent. His works have inspired many European mathematicians to contribute to the field of analysis and calculus.

## Contributions of Madhava

Madhava of Sangamagrama has made a notable contribution to the field of Mathematics. Few of his known contributions are:

In trigonometry, he has discovered power series expansions of arctangent, sine and cosine function. He has derived the  $\pi$  infinite series summation formulae. Madhava improved the works of great mathematicians like the works of Bhaskara II. He was the one who has taken the initiative in the development of calculus. By iteration and continued fractions, he also discovered the solutions of transcendental equations.



Madhava is the most significant medieval India's mathematician - astronomer. He is the founder of mathematical analysis. He is the founder of the most famous school called Kerala school of astronomy and mathematics. Most of Madhava's mathematical works have been lost, but whatever remained changed the phase of mathematics.

U. Varada



**MATH MAY NOT TEACH US HOW TO  
ADD LOVE OR  
SUBTRACT HATE BUT IT GIVES US HOPE  
THAT  
EVERY PROBLEM HAS A SOLUTION**

\* AJIL SHAI  
SECOND MATHEMATICS \*



## Srinivasa Ramanujan

Srinivasa Ramanujan was born on 22 December 1887. He was an Indian mathematician who lived during the British Rule in India. Though he had almost no formal training in pure mathematics, he made substantial contributions to mathematical analysis, number theory, infinite series, and continued fractions including solutions to mathematical problems then considered unsolvable.

Ramanujan initially developed his own mathematical research in isolation. according to Hans Eysenck: "He tried to interest the leading professional mathematicians in his work, but failed for the most part. what he had to show them was too novel, too unfamiliar, and additionally presented in unusual ways; they could not be bothered."



seeking mathematicians who could better understand his work. In 1913 he began a postal correspondence with the English mathematician G.H. Hardy at the University of Cambridge, England. Recognizing Ramanujan's work as extraordinary, Hardy arranged for him to travel to Cambridge. In his notes, Hardy commented that Ramanujan had produced groundbreaking new theorems, including some that defeated me completely: I had never seen anything in the least like them before and some recently proven but highly advanced result.

A deeply religious Hindu, Ramanujan credited his substantial mathematical capacities to divinity, and said the mathematical knowledge he displayed was revealed to him by his family goddess Namagiri Thayar. He once said "



"An equation for me, has no meaning  
unless it expresses a thought of  
God".

Anjana-c.v.







# ബൈതലോറസ്

ടൂറിങ് ഗോളാക്രമിയാണെന്നും ഗോളങ്ങൾക്കെല്ലാം അപര്യുക്തമായ സഞ്ചാരപാതയുണ്ടെന്നും പൂർണ്ണത നയിക്കിലെ പ്രശസ്തനായ ഗണിതശാസ്ത്രജ്ഞനും തത്ത്വജ്ഞാനിയുമായിരുന്ന ബൈതലോറസ് സമർത്ഥിച്ചു. ത്രികോണവികിരണ പ്രധാന സിദ്ധാന്തങ്ങളിലൊന്നായ ബൈതലോറസ് സിദ്ധാന്തം ഇദ്ദേഹത്തിന്റെ ശാസ്ത്രാവനമാണ്.

സംഗീതത്തിലും തത്ത്വപരനായിരുന്ന അദ്ദേഹം സംഗീതോപകരണങ്ങളിലെ ചരടുകളുടെ നിളം, വലിപ്പ് എന്നിവയ്ക്ക് ശബ്ദത്തിന്റെ ഉച്ചനീചാവസ്ഥ നിർണ്ണയിക്കുന്നതിൽ പ്രധാന പങ്കുണ്ടെന്ന് അദ്ദേഹം കണ്ടെത്തി. പ്രഭാതനക്ഷത്രവും സായാഹ്നനക്ഷത്രവും ഒന്നാണെന്ന് തേച്ചും മണ്ണിലാക്കിയത് ബൈതലോറസാണ്.

ഭൂതലശാസ്ത്രവും സമപ്രാശാസ്ത്രവും തേച്ചിരുന്നു അദ്ദേഹത്തിന്റെ പ്രധാനഗവേഷണമേഖലകൾ. അതിനു പുറമെ ബോതിശാസ്ത്രത്തിലും രാഷ്ട്രം, സംഗീതം എന്നീ മേഖലകളിലും ബൈതലോറസ് തന്റെതായ സാധനങ്ങൾ നൽകിയിട്ടുണ്ട്.

അദ്ദേഹത്തിന്റെ സാധനങ്ങളിൽ ഏറ്റവും വിലപ്പെട്ടത് ഇദ്ദേഹം ഗണിതത്തിലാണ്. മട്ടക്കോണത്തിലെ ചരങ്ങളെ സംബന്ധിക്കുന്ന സിദ്ധാന്തം ഇദ്ദേഹത്തിന്റെ പേരിലാണ് ശ്രദ്ധിക്കപ്പെടുന്നത്.

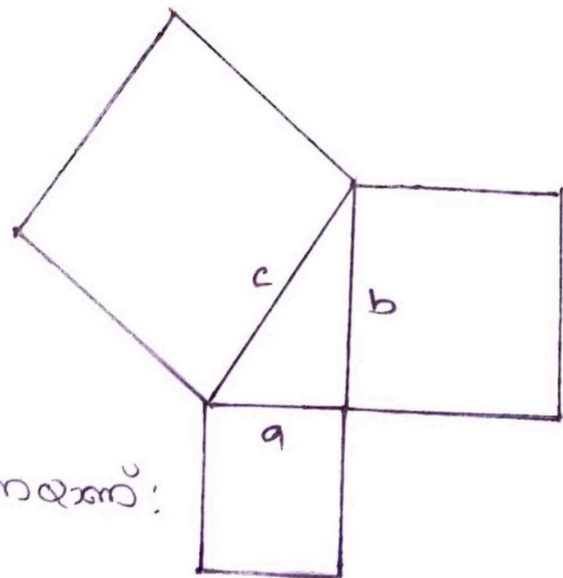


സംഖ്യകളെ ത്രികോണസംഖ്യകൾ, ചതുരസംഖ്യകൾ, പഞ്ചകോണ-  
സംഖ്യകൾ എന്നിങ്ങനെ തിരിച്ചു. ഉദാഹരണത്തിനു 1, 3, 6...  
ത്രികോണസംഖ്യകളായും 1, 4, 9, 16 തുടങ്ങിയവ ചതുരസംഖ്യകളായും  
1, 5, 12, 22 തുടങ്ങിയവ പഞ്ചകോണസംഖ്യകളായും ജോളഹം  
അപതരിപ്പിച്ചു. പൈതാഗോറസ് ആദ്യമായി  
അനുമാനിച്ചതും ഇതുസംഖ്യകളെ സ്തംഭങ്ങളെന്നും ദ്വൈതസംഖ്യ-  
കളെ പൂർണ്ണസംഖ്യകൾ എന്ന നിലയിലും വിശദീകരിച്ചു.  
സംഖ്യകൾക്കെല്ലാം ചിലസ്വഭാവങ്ങളും നൽകി. ഉദാഹരണത്തി-  
ന് 1 എന്ന സംഖ്യയെ യൂക്ലിഡോയത്തിന്റെ ദൈവമായും  
സ്രഷ്ടാവായും, 2 എന്ന സംഖ്യയെ അടിപോയങ്ങളുടെ  
ദൈവമായും ഇവർ കരുതി.

ഗണിതശാസ്ത്രത്തിലെ യൂക്ലിഡിന്റെ ജ്യോമിമിയിൽ  
ഒരു മട്ടത്രികോണത്തിന്റെ മൂന്ന് വശങ്ങളുടെയും ബന്ധങ്ങൾ  
വിശദീകരിക്കാൻ ഉപയോഗിക്കുന്ന ഒരു സിദ്ധാന്തമാണ്  
പൈതാഗോറസ് സിദ്ധാന്തം.

ഒരു മട്ടത്രികോണത്തിന്റെ  
വർഗ്ഗം അതിന്റെ പാദത്തിന്റെയും  
ലംബത്തിന്റെയും വർഗ്ഗത്തിന്റെ  
തുകയ്ക്ക് തുല്യമായിരിക്കും

ഈ സിദ്ധാന്തം പറയുന്നതിങ്ങനെയാണ്:



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

അല്ലെങ്കിൽ

$$c = \sqrt{a^2 + b^2}$$

Pranav. E. V







# RAMANUJA

Srinivasa Ramanujan Aiyangar (December 22, 1887 - April 26, 1920) was an Indian Mathematician. He is considered to be one of the most talented mathematicians in recent history. His father's name was Kuppaswami and Mother's name was Komalatammal. On 1st October 1892 Ramanujan was enrolled at local school. He did not like school so he tried to avoid attending. He had no formal training in mathematics. However, he had made a large contribution to number theory, infinite series and continued fractions. Srinivasa Ramanuja was a great Indian Mathematician.



# ലിജനാർഡോ ഡാവിഞ്ചി

ശില്പി, ചിത്രകാരൻ, വാസ്തുശിൽപി, ശാസ്ത്രജ്ഞൻ, ശരീര-ശാസ്ത്ര വിദഗ്ദ്ധൻ, സംഗീതവിദഗ്ദ്ധൻ, എഴുത്തുകാരൻ എന്നീ നിലകളിൽ പ്രശസ്തനായിരുന്നു ലിജനാർഡോ ഡാവിഞ്ചി. അച്ഛന്റെ പേര് ലിജനാർഡോ ദി സെർ പിയറാ എന്നും അമ്മയുടെ പേര് കാതെറിന എന്നും ആണ്. ഡാവിഞ്ചി എന്നാണ് അദ്ദേഹത്തിന്റെ ജനനപ്പേരായ ഇറ്റലിയിലെ വിഞ്ചിയെ സൂചിപ്പിക്കുന്നു.

ഇദ്ദേഹത്തിന്റെ സാന്ന മരിയ ഡെല്ല ഫ്ലാസ്കിയെ ദേവപയ-ത്തിലെ നിരവധിത്താലും ഫൊറോലിസ എന്നീ ചിത്രങ്ങൾ അവയുടെ കലാമൂല്യത്തിന്റെ പേരിൽ ലോകപ്രശസ്തങ്ങളാണ്. ഇദ്ദേഹത്തിന്റെ ചിത്രാശനികൾ നമ്മുടെ കാലത്തിനും മുമ്പിൽ ആയിരുന്നു. അദ്ദേഹ-പെരലികോപ്പർ, പ്ലാങ്ക്, കാൽക്കുലേറ്റർ എന്നിവ ഉപയോഗിച്ചുള്ള മാതൃകകൾ മുതലായവ അദ്ദേഹത്തെപ്പറ്റിയവയാണ്. പ്ലാനോഡയനാമിക്സിലെ നിയമങ്ങൾ വിമാനം കണ്ടുപിടിക്കുന്നതിന് 400 വർഷം മുമ്പ് ഇദ്ദേഹം കണ്ടുപിടിച്ചു. മേക്കാനിക്സും പിസ്കോ നെർവ്വൽ യൂഡേമിൻ പിസ്കയെ അനുപമിക്കുന്നതിന് ഡാവിഞ്ചിയുടെ നോട്ടബുക്കിൽ ഒരു നദിയിൽ അണക്കെട്ട് നിർമ്മിച്ചു.

ഒരു പുതിയ ചിത്രകലാദീപ്തി ഡാവിഞ്ചി വികസിപ്പിച്ചു-ടുത്തു. അക്കാലത്ത് ചിത്രകാരന്മാർ ഒരു വെളുത്ത പശ്ചാത്തലമായി-രുന്നു ചിത്ര വരയ്ക്കുന്നതിന് ഉപയോഗിച്ചിരുന്നത്. എന്നാൽ ഇദ്ദേഹം ഇരുണ്ട പശ്ചാത്തലമാണ് ഉപയോഗിച്ചത്. ഇത്തരം ശിരസ്സ് പതിർ ചിത്രത്തിലെ ഇരുണ്ട വസ്തുവിന് നൽകി. പല നിറങ്ങൾ ഉള്ള ഇരുണ്ട വെളിയിൽ ചിത്രങ്ങൾ വരയ്ക്കുന്നതിന് പ്രശസ്തനായിരുന്നു ഡാവിഞ്ചി.

ലിജനാർഡോ ഡാവിഞ്ചി ഉന്നത നവോത്ഥാനത്തിന്റെ നായകരിൽ ഒരാളായിരുന്നു. നവോത്ഥാന ചിന്തകളിൽ വളരെ അനുചരനായിരുന്നു ഡാവിഞ്ചി. ഒരിക്കൽ മനുഷ്യശരീരം എങ്ങനെ പ്രവർത്തിക്കുന്നു എന്ന് പഠിക്കുന്നതിന് ഒരു ശവശരീരം കീറിമുറിച്ച് സോക്കിയിട്ടുണ്ട്. ഡാവിഞ്ചി ലാറ്റിൻ ഭാഷയിലും ഗണിതത്തിലും ഭൂമിശാസ്-ത്രത്തിലും വിദഗ്ദ്ധനും നേടി.



ലിജണാർഡോവിന്റെ ജീവിതകാലത്തിൽ നന്നെ അഭ്യൂഹത്തിന്റെ നിർമ്മാണത്തിലൂടെ അസാധാരണമായ കവിതകൾ രചിച്ചു "വിശിഷ്ടമായ ശിരഃപടനമേഴും ഭരിച്ചേഴും", "പെർത്താതിനാന്നു പൊരയേഴും", "ഭോജനമായ ശക്തിയേഴും",

"ദാനശിലാത്തെയും നല്ലൊരുതരമായ വ്യാഖ്യാനമേഴും മനസ്സിന്റെ മനോഹരമായ വിശ്ലേഷമേഴും" തുറച്ചു വാസരി വിശദീകരിച്ചിട്ടുണ്ട്. അതുപോലെ അഭ്യൂഹത്തിന്റെ ജീവിതത്തിന്റെ പശ്ചാത്താപം മറ്റു വശങ്ങളും മറ്റുള്ളവരിൽ ജീവനായും ഉദാഹരണമാണെന്നു പറയപ്പെടുന്നു.



## ARCHIMEDES : FATHER OF MATHEMATICS

Archimedes, who is the father of Mathematics, served his lifetime, discovering various concepts, methods and techniques in Mathematics and Science. Though he is not with us in person today, his inventions and ideas are greatly being used today.

His principles and ideas will remain with us to inspire future lovers of science. His excellences and reputation helped him to earn the title of 'The father of Mathematics'. Today's modern world would not have been so developed scientifically without the outstanding contribution of Archimedes.

His devotion and dedication towards science and Mathematics molded and motivated the future generation to contribute to science and Mathematics with many more discoveries and inventions. The present scientists can follow Archimedes' footprints, who is the father of Mathematics, to contribute to society and bring laurels to the nation.

Adithya · C · P  
II Bsc Maths



8



6

 $\pi$ 

# ARYABHATA

1

Aryabhata was the first of the major mathematician - astronomers from the classical age of Indian mathematics and Indian astronomy. His works include the Aryabhatiya and the Arya-siddhanta.

0



K

2

## Place Value and Zero

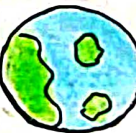
The place value system, first seen in the 3<sup>rd</sup> century Bakhshali manuscript, was clearly in place in his work while he did not use a symbol for zero, the French mathematician George Kish argues that knowledge of zero was implicit in Aryabhata's place value system as a place holder for the powers of ten with null coefficients.

0

7

## Approximation Of $\pi$

Aryabhata worked on the approximation for  $\pi$  ( $\pi$ ) and may have come to the conclusion that  $\pi$  is irrational. In the second part of the Aryabhatiyam, he writes 'Add 4 to 100, x by 8 and then add 62000. ie,  $\frac{62000}{20000} = 3.1416$



7

Anusha.k

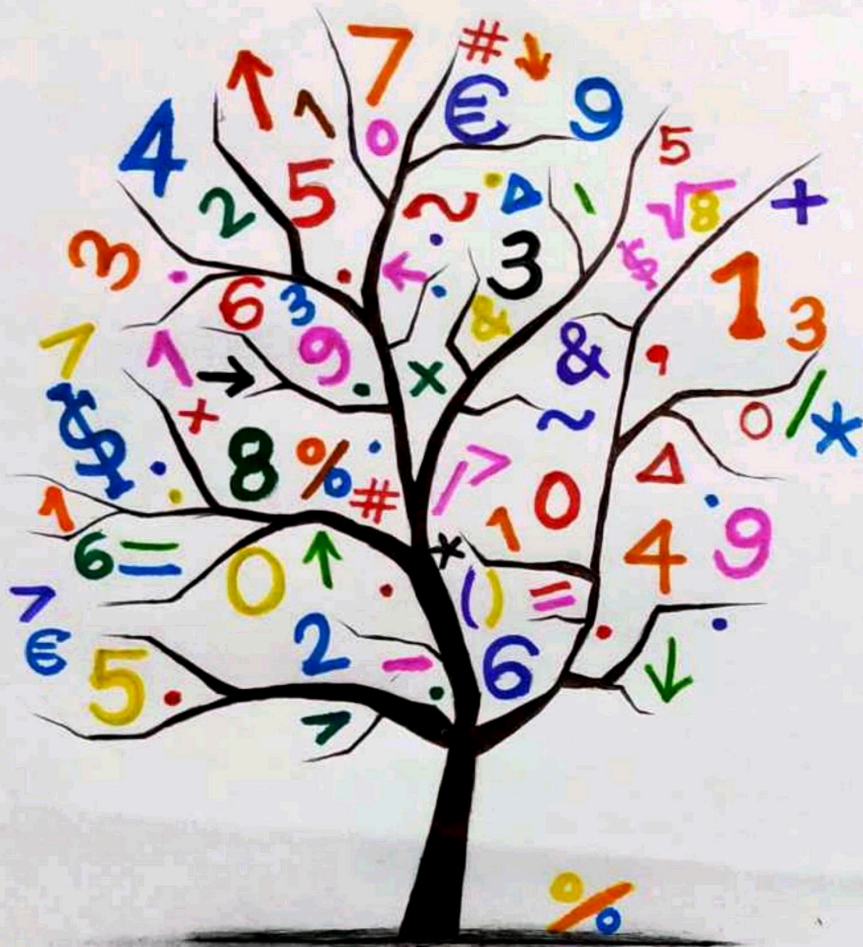


0

5

9





Life is a math equation.  
In order to gain the most,  
you have to know  
how to convert  
negatives into positives  
-Anonymous



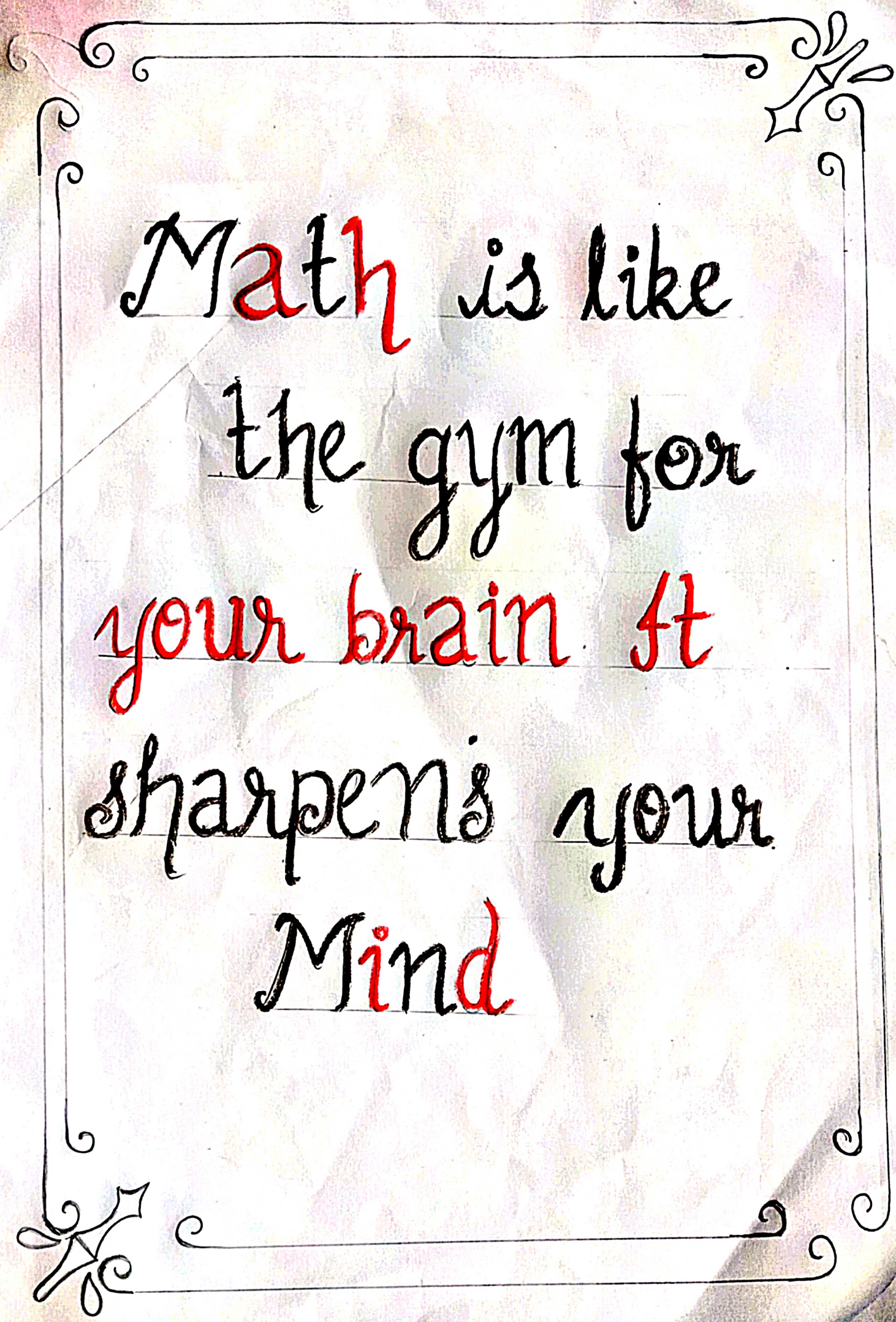
# HISTORY OF CALCULUS

In the history of mathematics two names are prominent to share the credit for inventing Calculus. Issac Newton (1642-1727) and G.W Leibnitz (1646-1717). Both of them independently invented Calculus around the seventeenth century. After the advent of Calculus many mathematicians contributed for further development of Calculus. The rigorous concept is mainly attributed to the great mathematicians, A.L. Cauchy, J.L.L Lagrange and Karl Weierstrass. Cauchy gave the foundation of Calculus as we have now generally accepted in textbooks. Cauchy used D'Alembert's Limit Concept to define the derivative of a function. Starting with definition of a limit, Cauchy gave examples such as the limit of  $\frac{\sin x}{x}$  for  $x \rightarrow 0$ . He wrote  $\frac{\Delta y}{\Delta x} = \frac{f(x+i) - f(x)}{i}$  and called the limit for  $i \rightarrow 0$ , the "function derivative,  $y'$  for  $f'(x)$ ".

Before 1900, it was thought that Calculus is quite difficult to teach. So Calculus became beyond the reach of youngsters. But just in 1900, John Perry and others in England started propagating the view that essential ideas and methods of Calculus were simple and could be taught even in schools. F.L. Griffin, pioneered the teaching of Calculus to first year students. This was regarded as one of the most daring act in those days.

Today, not only the mathematics but many other subjects such as physics, chemistry, Economics and Biological Sciences are enjoying the fruits of calculus. JUMANA.PP.





Math is like  
the gym for  
your brain. It  
sharpens your  
Mind



# THE HORIZON

SACRED HOTSPOTS OF THE WORLD





# RAINBOW

---

When it rains  
I always look up to the sky  
and wish  
If one day I may be able to  
see you  
But never ever you came  
After a rainy evening  
Wandering with empty thoughts  
without any hope, I looked beyond,  
In the sky, I saw you  
Glowing in seven colours of happiness  
But suddenly clouds made you  
disappear from my vision



RAINBOW

Your primordial image  
stayed my mind  
Still when it rains,  
I always look up the sky  
and wish  
If I could see see you  
Once Again . . . .

- TILLY K



# എന്തുകൊണ്ട് ?

★ 'അരണ കിട്ടാൻ ഉടനെ മരണം' എന്നു പറയുന്നതെന്തുകൊണ്ട് ?  
അരണ ഒരു വിഷജന്തുവല്ല. അത് അരണകളുടെ ഇരുവശങ്ങളിലും  
കാണുന്ന ചുവപ്പുകലർന്ന മഞ്ഞനിറം വിഷമാണെന്ന് പലരും കരു-  
തുന്നു. താമരയുടെ പ്രത്യേകചാദനകാലത്ത് കാണപ്പെടുന്ന ഒരു  
സവിശേഷതയാണ്. അരണകിട്ടാൻ ഉടനെ മരണം എന്നു പറയുന്നത്  
അസ്ഥവിശ്വാസത്തിന്റെ അടിസ്ഥാനത്തിലുള്ള ഒരു വിശ്വാസമാണ്!

★ വയറുനിറയെ ഭക്ഷണം കഴിച്ചാൽ ഉറക്കം വരുന്നതെന്തുകൊണ്ട് ?  
അധികം ഭക്ഷണം കഴിച്ചാൽ, വയറിലെയും ദഹനവ്യവസ്ഥയിലേയും  
രക്തചംക്രമണം വർദ്ധിക്കും. ഭക്ഷണത്തിൽ അടങ്ങിയിരിക്കുന്ന ചെറു-  
കാംശങ്ങൾ വലിച്ചെടുത്ത് കൊശങ്ങളിൽ എത്തിച്ചു കൊടുക്കുന്നതി-  
നാണിത്. അപ്പോൾ മറ്റ് അവയവങ്ങളിലേക്കുള്ള രക്തപ്രവാഹം  
സ്വാഭാവികമായി കുറയ്ക്കപ്പെടും. തലച്ചോറിലേക്ക് പ്രത്യേക കുറച്ച്  
രക്തമേ ലഭിക്കുന്നുള്ളൂ. ഭക്ഷണത്തോടെ അതിൽ കുറവ് വരുന്നു.  
ഇതാണ് ഭക്ഷണം കഴിച്ചാൽ ഉറക്കം വരാൻ കാരണം!

★ ചിരിക്കുന്നതെന്തുകൊണ്ട് ?

പണ്ടോം ഭോജനവോഴാണ് നാം ചിരിക്കുന്നത്. മരച്ചീന്തിന്റെ ജന്മപിഡ-  
മായ കഴിവാൻ പൂഞ്ചിരി. ജനിച്ച് ഒരാഴ്ചയ്ക്കുള്ളിൽ കുഞ്ഞുങ്ങൾ  
പൂഞ്ചിരിച്ചു തുടങ്ങുന്നു. ഒരു വയസ്സാകും മുമ്പുതന്നെ, താൻ ചിരി-  
ക്കുമ്പോൾ മറ്റുള്ളവരിൽ നിന്ന് - പ്രത്യേകിച്ച് അമ്മയിൽ നിന്ന് -  
ലഭിക്കുന്ന പ്രതികരണങ്ങളിൽ നിന്ന് ചിരി നൽകാതെന്ന് കുഞ്ഞ്  
മനസ്സിലാക്കുന്നു. രണ്ട് വയസിനു മുമ്പുതന്നെ കുഞ്ഞിന്റെ ചിരി  
പൊട്ടിച്ചിരിയാകുന്നു. മറ്റു ജീവജാലങ്ങൾക്കില്ലാത്ത, മരച്ചീന്തിനും മറ്റും  
ലഭിക്കുന്ന ഒരു ജന്മപിഡിയാണ് ചിരി!



\* 'ഏക്കിക്' ഉണ്ടാവുന്നതെന്തുകൊണ്ട് ?

ഏക്കിക് അനുഭവപ്പെടാത്തവർ വീളുമായിരിക്കും. നമ്മുടെ ശരീരത്തിനകത്ത് നെഞ്ചറയെ ഉദരത്തിൽ നിന്നും വേർതിരിക്കുന്ന ഡയഫ്രത്തിലോ അതിലേക്കുള്ള നാഡിയിലോ ഏതെങ്കിലും അണുവിലുള്ള അസ്ഥിമൂല അനുഭവപ്പെടുമ്പോൾ അത് ഏക്കിക് ഉണ്ടാകുന്നത്. അസ്ഥിമൂല ഉണ്ടാകുമ്പോൾ ഡയഫ്രം ചുരുങ്ങുകയും ഈ ചുരുങ്ങൽ തടയാനായി ചെറുനാക്ക് അടയുകയും ചെയ്യുന്നു.

ചെറുനാക്കിന്റെ ഈ അടയൽ അത് നമുക്ക് ഏക്കിക് അയി അനുഭവപ്പെടുന്നത്. അമിതമായി ചിരിക്കുമ്പോഴും ധ്വനിപിടിച്ച് ഭക്ഷണം കഴിക്കുമ്പോഴും ദഹനക്കുറവ് ഉണ്ടാവുമ്പോഴൊക്കെ ഡയഫ്രത്തിന് അസ്ഥിമൂലയുണ്ടാകാനും ഏക്കിക് അനുഭവപ്പെടാനും പാധ്യതയുണ്ട് !

\* കൃർക്കുവലി ഉണ്ടാവുന്നതെന്തുകൊണ്ട് ?

ചില മനുഷ്യർ ഉറങ്ങുമ്പോൾ ചുറ്റും കൃർക്കു വലിക്കുന്നു. വായിലൂടെ പ്രസിക്കുമ്പോഴുണ്ടാകുന്ന ഒരു പ്രത്യേക ശബ്ദമാണ് ഇത്. നമ്മുടെ പ്രസനായമലം കൂറാണ്. എന്നാൽ കൂതിൽ ഉണ്ടാകുന്ന ഏതെങ്കിലും തടസ്സങ്ങൾക്കൊണ്ടോ ശീലം കൊണ്ടോ ചിലർ വായിൽ കൂട്ടി വ്രാസം വലിക്കാറുണ്ട്. ഉറക്കത്തിൽ ഇങ്ങനെ വായിലൂടെ പ്രസിക്കുമ്പോൾ വെളിയിലേക്കു വരുന്ന വായു വായുവെ പിന്നിലും കൂതിലുള്ള പേശികളെ ക്ലിന്നുടും. പിന്നുടും അടയ്ക്കുന്നു (flutter). ഈ പ്രവർത്തനത്തെ ഉണ്ടാകുന്ന ശബ്ദമാണ് കൃർക്കുവലിയാ-  
ലി നാം കേൾക്കുന്നത് !

Nandhana Krishnan.  
II<sup>nd</sup> Mathematics.



എ വിലി മേം

നോമ്പുവ്രതം!

- ശ്രീനാഥ്.വി

നമ്മുടെ വീടുതളിൻ പലപോലും  
 രല്ലം ചെയ്തൻ നൃത്തത്തു കാണിവരുന്ന വിരുന്ന  
 ഓരൻ ചിത്തൻ പലപോലും ഇവ നമ്മുടെ  
 തന്ന രല്ലം വില്ലാത്തൊന്നാല്ല. ഇങ്ങനെ  
 രല്ലം തിരഞ്ഞെടുക്കുന്നില്ല ആത്ത് തന്നി  
 ചെന്നുതീർന്നു ആരാണ്! പലി പലി രാമൻ-  
 ന്നാൻ പോലും ഇങ്ങനെയൊരൊരൾ  
 തന്ന തെളിവിട്ടുണ്ട്!

[illegible]



അറിടത്തുള്ള ഓരീരിതവും സ്വഭാവപരമായി  
കൂട്ടി വിവരമുപയോഗിച്ച് പട്ടാളക്കാരെ.

ഇവയുടെ കഴിവ് ഹൃദയം കൂട്ടുതൽ  
പോലെയെങ്കിലും അറിതന്റെ ചരിവിലുള്ളതായിരുന്നു  
പറമ്പുതട്ടിലെ തൊടിയിലുള്ളതായതെ ഈ തൊടിയിൽ  
മുത്തുനീർക്കര തൊടാതിരുന്ന ചിത്തമുതൽ  
തന്റെ നാമം അമ്മയെപ്പോലെയായി. പൊതുവെ  
താപനിലയുടെ വർദ്ധനവ് ഇവയുടെ നാശത്തിന്  
താരതമ്യമാണെന്നും. അതുകൊണ്ടുതന്നെ  
തൊടിയിലായി ജീവിക്കുന്ന ഇവയുടെ കൂട്ടത്തിൽ  
ലക്ഷണത്തിന് ചിതയുതൽക്കാണ് ഉണ്ടാകുക.  
അതുകൊണ്ട് അവിടെ ഉണ്ടാകുന്ന താപനിലയും  
കാൽനീരുമുണ്ടാകും മൂന്ന് ചിതയിൽത്തന്നെ  
ഉണ്ടാകും. ഈ പാർക്കും ഇവർ പരിചരിക്കുന്നത്  
ഇവയുടെ കൂട്ടത്തിൽ ചേർന്നാണ് കേൾക്കുകയാണ്  
കൃത്യമായ രീതിയിൽ തെളിയിച്ചുവന്നതാണ് കൂട്ടത്തിൽ  
ചേർന്നതായതായിട്ടും ദിനത്തിൽത്തന്നെ ചിലർത്തന്നെ  
കൂടും അത് അത് ഉൾക്കൊള്ളിയെ വെക്കു  
ത്തന്നെ ഇവ ഇവയെപ്പോലെയെന്നും. ധാരാളം  
നമ്മുടെ നാട്ടിലെ അതേപോലെയുള്ളതെ അതിനോട്  
ചിലർക്കുള്ളതെ തുടർച്ചയായാണ്. അതുകൊണ്ട്  
തന്നെത്തന്നെത്തന്നെ ഇവ ഒരു തീർപ്പു വെക്കുന്ന  
മേഖലയിൽക്കൂടിയാണ് അതെന്നും. അതിനോട്  
ചേർന്നതായതായിട്ടും 2014 വരെ പലപ്പോഴും  
ചിലർ ചുരുക്കം അതെന്നായിട്ടുണ്ട്.

ചേർന്നതായിട്ടും അത് ജീവിയെ നീക്കി  
മറിയാലും അതെന്നെ ചേർന്നതായതാണ്  
അത് തന്റെ അത്ഭുതത്തെപ്പറ്റി കഴിവും. ചേർന്ന  
തായിട്ടും അത് ജീവനെ തന്നെത്തന്നെ പല  
തരത്തിലുള്ള കഴിമുതൽക്കാണ്. ഒരു തീർപ്പു വെക്കുക!



# E Sport - A Rising Sport

If you've never heard of E-sports, or what it is, time for you to pay attention: There's a new rising cult in the world of competitive sports, which is internet sports. According to Wikipedia, E-sports is defined as: "a team for organized multiplayer video game competitions, particularly between professional players. The most common video game genres associated with electronic sports are real-time strategy, fighting, first-person shooter, and multiplayer online battle arena."

To give a back history around E-sports, it was first introduced in South Korea. Sports in the form of playing video games, became an overnight hit in the country. Its primary focus being on computer games, the country took the concept of competitive ~~vs~~ video gaming, and introduced a cult hit through the game Starcraft - created by Blizzard. Fans of all ages, both male and female, became infatuated with watching players play live competitive e-sports against one another. Top players became overnight celebrities, being sponsored by major corporations such as Samsung. A top player could earn an average of over \$100,000 per year based off of earnings from winning.

Fast forward to present day, E-sports has now become a global phenomenon. Not only just in South Korea, but countries all over the



would are now having E-sports leagues, teams, and a growing fan base. With the rise of technology and streaming, companies like YouTube and Twitch-TV have helped showcase competitive gaming a lot more. Now, E-sports teams aren't just your local fan favorites, they have become world-wide sensations, with fans from all across the globe following them religiously. Keeping up with the trend, there have been a lot of new tech companies getting funding for E-sports as well. For example, Mobcrush, just recently announced an \$11M funding raise, for 'live mobile game streaming.' It's no surprise that companies like Mobcrush are getting funded for E-sports and gaming related areas. This is most likely because of the marketing potential E-sports can bring, even here in the U.S, the sport has grown so big.

It's amazing to see how popular this sport has become. I'm sure brands and marketers alike are playing a lot of attention to this phenomenon. It's a growing cult has a massive audience. I can only imagine that it continues to gain popularity as technology advances. It seems that E-sports has become a sport that connects everyone across the globe.



# നിനക്കായ്

നിന്നെ തണിക്കടുത്തുനാരുവാൻ ആകുമോ ഈ ജീവം,  
നിന്നെയൊന്നു കൺകുളിർത്തെ കാണുവാൻ,  
നിന്റെ വശമാം സ്നേഹവും ആസ്വദിക്കുവാൻ  
വെറുമൊരു പാഴ്പ്പപ്പം പോലെ എന്നിൽ  
നിന്നും മാധുര്യം നീ...  
മധുരമാം ഒരു ദാർമ പോലും തരാതെ എന്നിൽ  
നിന്നും മധുര്യം നീ...  
ലഹരി പോലുള്ള സ്നേഹവും  
നീർമാതൃക പോലുള്ള പ്രണയവും  
നിയെനിക്ക് പങ്കാണിട്ടുമോ...  
അതോ, നീയും എന്നെ നിരാശപ്പെടുത്തുമോ...  
ഇല്ല, എന്നിങ്ങുചുണ്ട്, നിയെനെ നിരാശപ്പെടുത്തില്ല.  
ഒരു പുത്തൻ ചുലരി നിന്നിൽ ഞാൻ  
തണിക്കടുത്തുനാരും.  
ആരും തൊന്തിരുന്ന പ്രണയം നീ എന്നിങ്ങു  
പങ്കാണിട്ടും.  
ആരും തൊന്തിരുന്ന ലഹരിയെ പോലും വെല്ലുന്ന-  
സ്നേഹം നിയെനിക്കായ് ഒരുക്കിയെങ്കും.  
എന്നിങ്ങുചുണ്ട് നീ എന്നെ നിരാശപ്പെടുത്തില്ല.  
ദാഹിജ്ജലത്തിനായി കേഴുന്ന ഒരു ചെറുവെളിനെ  
പോലെ ഞാൻ നിനക്കുചേർന്നി കാത്തിരിക്കും...

Abhishek Joseph K  
2nd Mathematics.



# ENTREPRENEURSHIP

## WITHIN THE MODERN ERA

- SREENATH V

Entrepreneurship to economic development and undeniably, there is a global drive to accelerate the growth and development of nations through innovation and creativity. Support for small and medium businesses has emerged as a top priority on the global agenda and are no longer seen as a threat to the established system. With that in mind, policy makers have long accepted that entrepreneurs and start up companies have a critical role to play as the key drivers of economic growth.

The importance of entrepreneurs is evident as seen in recent initiatives focused on startups, especially in developing nations. Some nations have already advanced in the setting up of support systems and agencies to assist emerging entrepreneurs at each step of their journey by providing early stage financing, technical training and market intelligence. These systems will help to regulate the playing field for startups and



entrepreneurs and may even guarantee a few successes through thorough coaching and mentoring.

Entrepreneurship today is 'survival driven', self-employment, formed out of necessity as well as opportunity motivated, largely because poverty and lack of formal employment opportunities rear its ugly head in struggling economies. Entrepreneurs see "problems" as "opportunities", then boldly set out to identify the solutions to those problems. There's really no holding or avoiding some of these obstacles that entrepreneurs face along ~~not~~ their journey. None. Nonetheless, the challenges and changes are not to be dreaded but defeated. A true entrepreneur sees opportunity in the market and bring about change to create a value through solutions. An entrepreneur aims at success, will move forward and make mistakes, learn from mistakes and grow their dream company.

"Don't be embarrassed by your failures. Learn from them and start over again."

— Richard Branson



# stars

In a lonely night  
having chat with them,  
while cold wind blows  
Gazing at them,  
counting them and making  
a wish,  
Like our eyes blink,  
they twinkle  
We see them as a small point  
of light in the sky.  
Nights are incomplete  
without them.

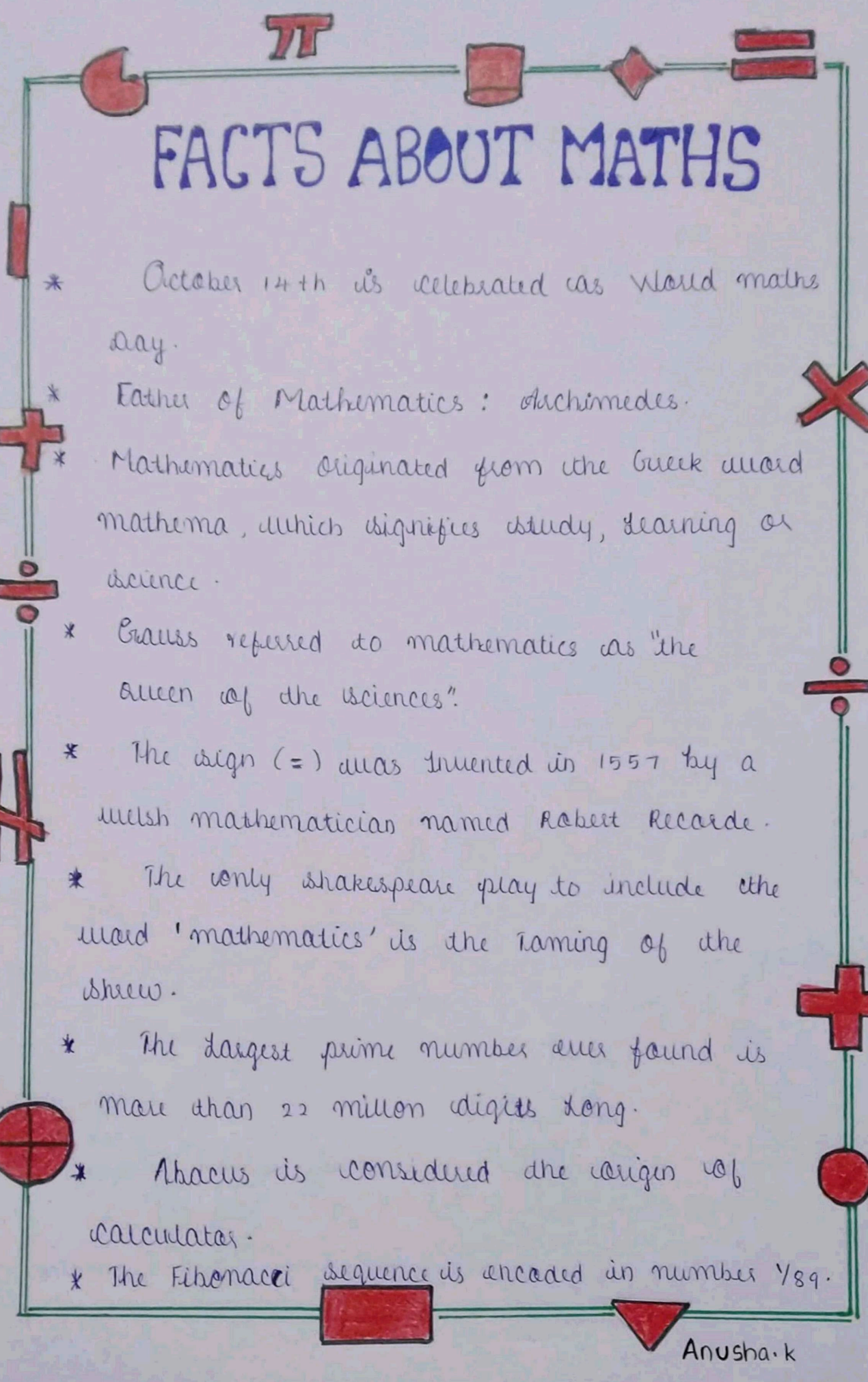
- JIJIL V.K



***FACTS !!***







# FACTS ABOUT MATHS

\* October 14th is celebrated as World Maths Day.

\* Father of Mathematics: Archimedes.

\* Mathematics originated from the Greek word mathema, which signifies study, learning or science.

\* Gauss referred to mathematics as "the queen of the sciences".

\* The sign (=) was invented in 1557 by a Welsh mathematician named Robert Recorde.

\* The only Shakespeare play to include the word 'mathematics' is the Taming of the Shrew.

\* The largest prime number ever found is more than 22 million digits long.

\* Abacus is considered the origin of calculators.

\* The Fibonacci sequence is encoded in number 189.



# Some fun facts on Mathematics ...!

"Pure mathematics is, in its way, the poetry of logical ideas"

- Albert Einstein

Even though numbers can be scary sometimes, but if learned properly and with fun, they can be pretty amazing tool. To make our point, let's see few interesting facts about mathematics.

1. Google is all about mathematics.

The lifeline of today's time, Google, derived its name from the word 'googol'--a mathematical term for the number 1 followed by 100 zeros, which reflect infinite amount of search on the internet.

2. Crazy multiplications

A very interesting things about math is how crazy it gets with its function. If you multiply 111,111,111 by 111,111,111 this becomes the answer 12,345,678,987,654,321.



### 3. Dreadfully long division

Another mind-boggling application of maths comes in where the number 1 is divided by 998,001. The answer would give you a complete sequence from 000 to 999 in order.

### 4. Pizza and math: Are they related?

We may seem like someone who is ruining pizza for you but you will be amazed to know its relation with maths. To find the volume of cylindrical shape of the pizza, the formula used is  $\pi \times r^2 \times h$ . So if an ordinary pizza has radius of 'z' and height 'a', its volume is  $\pi \times z \times z \times a$  which makes up 'Pizza'.

### 5. Magical digit!

The number 9 is called a magical number with certain interesting properties. If you multiply a number with 9 and add all the digits of the resulting number the sum would always come out to be 9.

### 6. The growth of our mathematical knowledge

In 1900, all the world's mathematical knowledge could be written in 80 books; today it would fill more than 1,00,000 books.



# TAXY CAB NUMBER

In mathematics the  $n^{\text{th}}$  taxicab number typically denoted  $Ta(n)$  or  $Taxicab(n)$  also called the  $n^{\text{th}}$  Hardy-Ramanujan number is defined as the smallest integer that can be expressed as a sum of two positive integer cubes in  $n$  distinct ways. The most famous taxicab number is  $1729 = Ta(2) = 1^3 + 12^3 = 9^3 + 10^3$ . The name is derived from a conversation in about 1919.

The concept was first mentioned in 1657 by Bernard Frenicle de Bessy, who published the Hardy-Ramanujan Number  $T(a) = 1729$ . This particular example of 1729 was made famous in the early 20th century by a story involving Srinivasa Ramanujan. In 1938, G.H. Hardy and E.M. Wright proved that such numbers exist for all positive integers  $n$ , and their proofs is easily converted into a program to generate such numbers.

The taxicab numbers subsequent to 1729 were found with the help of computers. The restriction of the summands to positive numbers is necessary because allowing negative numbers allows for more instances of numbers that can be expressed as the sum of cubes in  $n$  distinct ways. The concept of a cabtaxi number has been introduced to allow for alternatives, less restrictive definitions of this nature. In a sense the specification of two summands and Powers of three is also restrictive; a generalized taxicab number allows for these values to be other than two and three respectively.

VARSHA · P



# Math Trick

Step 1 : Come up with any number.

Step 2 : Subtract 1 from this number.

Step 3 : Multiply your answer with the number 3.

Step 4 : Add 12 to the number.

Step 5 : Divide the result by 3.

Step 6 : Add 5 to your answer in step 5.

Step 7 : Subtract the first number you came up with (in step 1) from the number you resulted in at the end of step 6.

**AND THE ANSWER IS... 8!**



## MYSTERIOUS NUMBER 6174

The number 6174 is a really mysterious number. In 1949 the mathematician D R Kaprekar from Devdasi, India devised a process now known as Kaprekar's operation. First choose a four digit number where the digits are not all the same (that is not 1111, 2222...). Then rearrange the digits to get the largest and smallest numbers these digits can make. Exactly, subtract the smallest number from the largest to get a new number, and carry on repeating the operation for each new number.

Let us do an example



Take 2005

Biggest number we can make = 5200

Smallest number we can make = 0025

$$5200 - 0025 = 5175$$

$$7551 - 1557 = 5994$$

$$9954 - 4599 = 5355$$

$$5553 - 3555 = 1998$$

$$9981 - 1899 = 8082$$

$$8820 - 0288 = 8532$$

$$8532 - 2358 = 6174$$

$$7641 - 1467 = 6174$$

When we reach 6174 the operation repeats itself, returning 6174 every time

Let us try again starting with 1789

$$9871 - 1789 = 8082$$

$$8820 - 0288 = 8532$$

$$8532 - 2358 = 6174$$

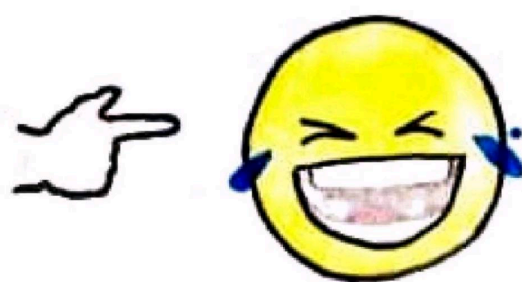
We reached 6174 again

Advaith Krishnan  
II<sup>nd</sup> BSc Maths



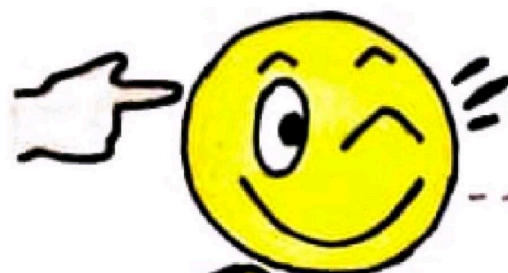
# FUNNY MISTAKES THAT ALLOW THINKING TO HAPPEN STICKERS

MATHS  
It's all fun and games UNTIL  
Someone divides by zero



If maths seem easy, you are doing it wrongly ~~X~~

Don't argue with a 90° Angle  
It's always right



I'm a Math Teacher, 'Of Course ÷ I have = PROBLEMS!!

PLAN  
(P+L)(A+N)

PA + PN + LA + LN

Your Plan has been foiled





# AMAZING FACTS

- Zero is the only number which cannot be represented by Roman numerals.
- 2 & 5 are the only primes that end in 2 or 5.
- An icosagon is a shape with 20 sides.
- Among all shapes with the same perimeter a circle has the largest area.
- Abacus is considered the origin of the calculator.
- Here is an interesting trick to check divisibility of any number by number 3. A number is divisible by three if the sum of its digits is divisible by three.
- Have you heard about Fibonacci? It is the sequence of numbers wherein a number is the result of adding the two numbers before it. Example: 1, 1, 2, 3, 5, 8, 13, 21, 34, & so on.

BY: HRIDHYA ANOOP



## Maths Quiz

① Who is the father of Mathematics?

Ans: Archimedes.

② Who discovered zero (0)?

Ans: Arybhatta, AD 458.

Explanation: Arybhatta invented zero but he didn't give any symbol for zero, Brahmagupta was the first to give symbol for zero and rules to compute with zero.

③ The average of first 50 natural numbers?

Ans: 25.5

④ When is  $\pi$  day celebrated around the world

Ans: March 14

⑤ Angle greater than 180 degrees but less than 360 degrees are called?

Ans: Reflex Angles

⑥ Who discovered the symbol Infinity ' $\infty$ '?

Ans: John Wallis.

⑦ Father of Algebra?

Ans: Muhammand Ibn Musa al khwarizmi

⑧ Who discovered Fibonacci sequence?

Ans: Leonardo pisano Bigollo.



9) Where was Abacus invented?

Ans : China.

10) Father of Trigonometry?

Ans : Hipparchus.

11) Write the next number of the following sequences 1, 1, 2, 3, 5, 8, 13, — ?

Ans : 21

12) Who created BODMAS rule?

Ans : Achilles Reselfelt

13) How many zeros are there in one Billion?

Ans : 9 (nine)

14) Who discovered summation  $\Sigma$ ?

Ans : Srinivasa Ramanujan.

15) Roman number of 40?

Ans : XL

16) Which is the only even prime number?

Ans : 2

17) Which is the smallest Perfect Number?

Ans : 6.



18 Who is known as the prince of Mathematics in India?

Ans: Srinivasa Ramanujan.

19 Which is known as Ramanujan-Hardy Number?

Ans: 1729

20 How many seconds are there in one hour?

Ans: 3600 seconds

21 Who discovered division sign  $\div$ ?

Ans: Johann Rahn.

22 What comes after a Trillion?

Ans: Quadrillion

23 What is the other name of the perimeter of a circle?

Ans: Circumference

24 What Phobia is the fear of numbers?

Ans: Arithmophobia

25 What is the name of the number system with base 2?

Ans: Binary.



## It's AMAZING

- ) Letters a, b, c and d do not appear anywhere in the spellings of 1 to 99.
- ) Letters a, b and c do not appear anywhere in the spelling of 1 to 999.
- ) Letters b and c do not appear anywhere in the spelling of 1 to 999, 999, 999.
- ) Letter c do not appear anywhere in the spelling of entire English counting.
- ) Letter d comes first in HUNDRED.
- ) Letter a comes first in THOUSAND.
- ) Letter b comes first in BILLION.

There are four numbers after 1, which are sum of the cubes of their digits.

$$153 - 1^3 + 5^3 + 3^3$$

$$370 - 3^3 + 7^3 + 0^3$$

$$371 - 3^3 + 7^3 + 1^3$$

$$407 - 4^3 + 0^3 + 7^3$$



- + 2520, is the smallest number that is exactly divisible by all numbers from 1 to 10.
- \* 60, is the smallest number that is exactly divisible by all the numbers from 1 to 5.
- ÷ 'FOUR' is the only number in the English language, that is spelt with the same number of letters as the number itself.
- 'ONE' is the only number that is spelt with letters arranged in descending order.
- % 'FORTY' is the only number that is spelt with letters arranged in ascending order, or alphabetical order.
- \* Among all shapes with the same perimeter, a circle has the largest area.
- \* Among all shapes with the same area, a circle has the shortest perimeter.

Riya PC  
 II BSc Mathematics



# TROUBLESHOOT YOUR BRAIN

At the first glance the following mathematical derivations look perfectly okay. Have a close look; something wrong somewhere. Where?

- $1 = 2$

$a$  and  $b$  are two positive integers and assume that

$$a = b \quad - \textcircled{1}$$

Step 1: Multiply both sides with  $a$ , we get

$$a \times a = b \times a \quad a^2 = ba$$

Step 2: Subtract  $b^2$  from both sides,

$$a^2 - b^2 = ba - b^2$$

This can be written as,

$$(a+b)(a-b) = b(a-b)$$

Step 3: Divide both sides with  $(a-b)$ , we get

$$(a+b) = b \quad - \textcircled{2}$$

Assign  $a=1$  in equation number  $\textcircled{1}$

We get,  $a=b=1$ ;



Substitute these values in the equation ②,

We get,  $1+1=1$

ie,  $\underline{\underline{2=1}}$

Can you find the wrong step?

### ANSWER

If  $a=b$  then  $a-b=0$ . In the third step of the derivation we divided the equation with  $(a-b)$  which is actually zero. Division by zero is against mathematical rules. Since we violated this mathematical rule, we got the wrong result  $1=2$ .

Swathi.K  
II<sup>nd</sup> Mathematics



## INTERESTING FACTS ON ARCHIMEDES

There are several interesting facts about Archimedes. An award, namely 'The Field Medal', is designed with Archimedes' image in memory of his contribution. This prestigious award is presented to the great mathematicians of their time.

The name Archimedes received great popularity. As a result, an asteroid was named after this Greek scientist's name. Besides these, there is a famous mountain range named after the famous Greek mathematician, the father of mathematics, known as Montes Archimedes. It is a mountain range situated on the Moon. The popularity of his name and discoveries increased in fever pitch day by day.

Adithya. C.P  
11 Bsc Maths



# Let's Solve This Puzzle!

Mathematical puzzles makes up an integral part of recreational mathematics.

## Diophantus

The Puzzle: We know very little about the life of the mathematician Diophantus (often known as the 'Father of Algebra') except that he came from Alexandria and he lived around the year 250 AD.

However, there remains a riddle that describes the spans of Diophantus's life:

"This tomb told Diophantus. Ah, what a marvel!  
And the tomb tells scientifically the measure of his  
life. God vouchsafed that he should be a boy for the  
sixth, for the sixth part of his life; when a twelfth  
was added, his cheeks acquired a beard; He kindled for  
him the light of marriage after a seventh, and in the  
fifth year after his marriage he granted him a son.

Alas! late-begotten and miserable child, when  
he had reached the measure of half his father's life,



the chill grave took him. After consoling his grief by this science of numbers for four years, he reached the end of his life".

In simpler, it says: Diophantus' youth lasted  $\frac{1}{6}$  of his life. He had the first beard in the next  $\frac{1}{12}$  of his life. He, at the end of the following  $\frac{1}{7}$  of the lifetime; Diophantus got married. Two years from, his son i.e., five years from then his son was born. His son lived exactly  $\frac{1}{2}$  of the Diophantus's life. Diophantus died 4 years after the death of his son.

How long did Diophantus live?

The solution.....

There is an equation to reflect the several ages of Diophantus:

$$\frac{1}{6}x + \frac{1}{12}x + \frac{1}{7}x + 5 + \frac{1}{2}x + 4 = x$$

So the solution ( $x$ ) is 84 years.

Divika S. Unnod

II<sup>nd</sup> Mathematics



# Math Jokes

- Why was six afraid of seven?

Because seven, eight, nine!

- How do we know the fractions,  $x/c$ ,  $y/c$ , and  $z/c$ , are all in Europe?

They are all over c's!

- Why does Algebra make you a better dancer?

Because you can use the algo-rhythm!

- I had an argument with a  $90^\circ$  angle.

It turns out it was right.

- Why did the mathematician spill all of his food in the oven?

The directions said, "Put it in the oven at  $180^\circ$ ."

BY : HRIDHYA ANOOP



# Maths, Maths, Maths!

Down with old pythagoras  
And down with rotten maths  
Down with Archimedes,  
And drown him at the baths.

If anyone had to do it  
I'd make sure it was me  
First I'd wholly immerse him,  
Then kick him up a tree.

When he had been disposed of,  
I'd turn on old pythag  
I'd drag him through a holly bush,  
And he'd come out like a rag.

Now my pipe dream's over,  
And I've nothing more to say  
Except that Maths still lives on  
To be taught another day.

Jeeshma Jayaraj



# Do you know ?

- \* The word "hundred" comes from the old Norse term "hundrath" which actually means 120 and not 100.
- \* "Forty" is the only number that is spelt with letters arranged in alphabetical order.
- \* "One" is the only number that is spelt with letters arranged in descending order.
- \* Every odd number has an 'e' in it.
- \* "Eleven plus two" is an anagram of "twelve plus one", which is pretty fitting as the answer to both is 13.  
Also, there are 13 letters in both "eleven plus two" and "twelve plus one".
- \* "Four" is the only number in the English language that is spelt with the same number of letters as the number itself.
- \* The word "mathematics" only appears in one Shakespearean play, "The Taming of the Shrew".

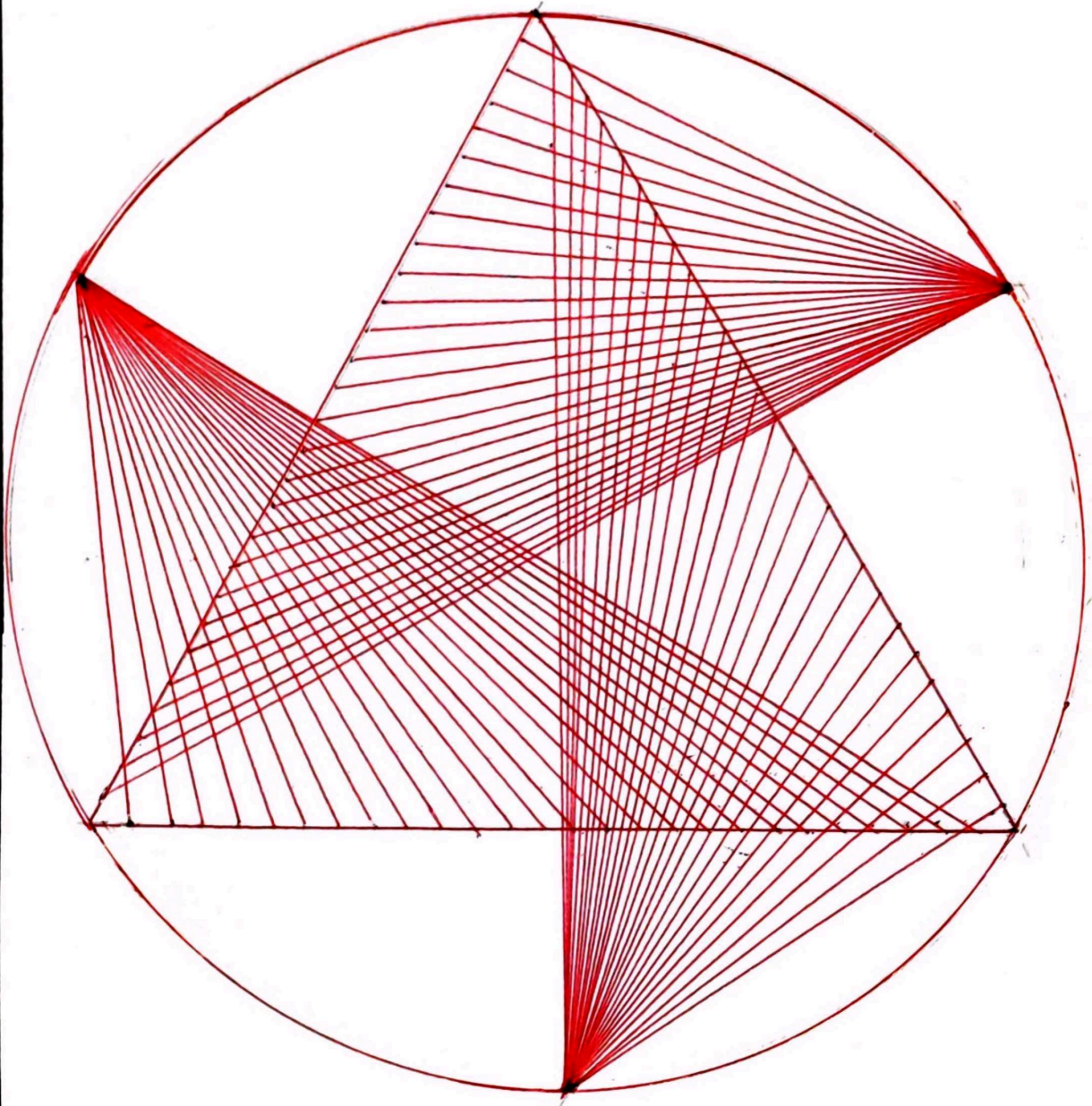


# SUNRISE COLOURS





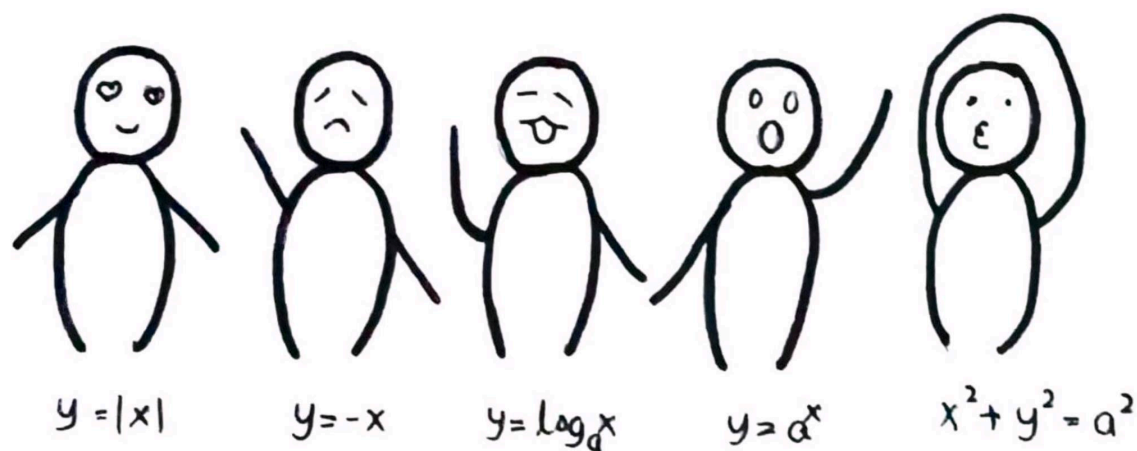
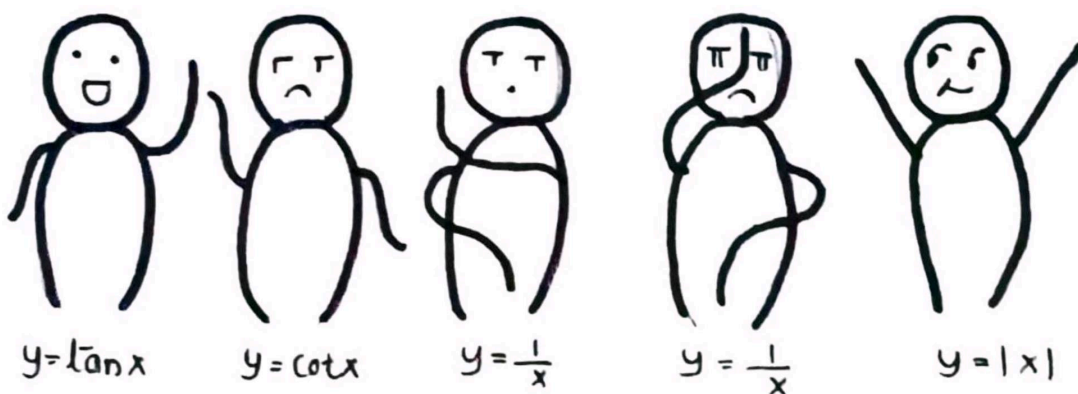
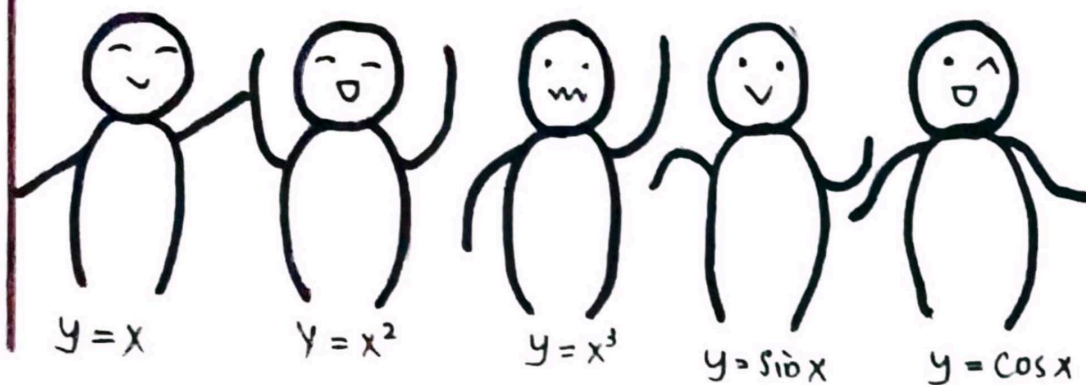
# Geometric Patterns



Ajil shaji

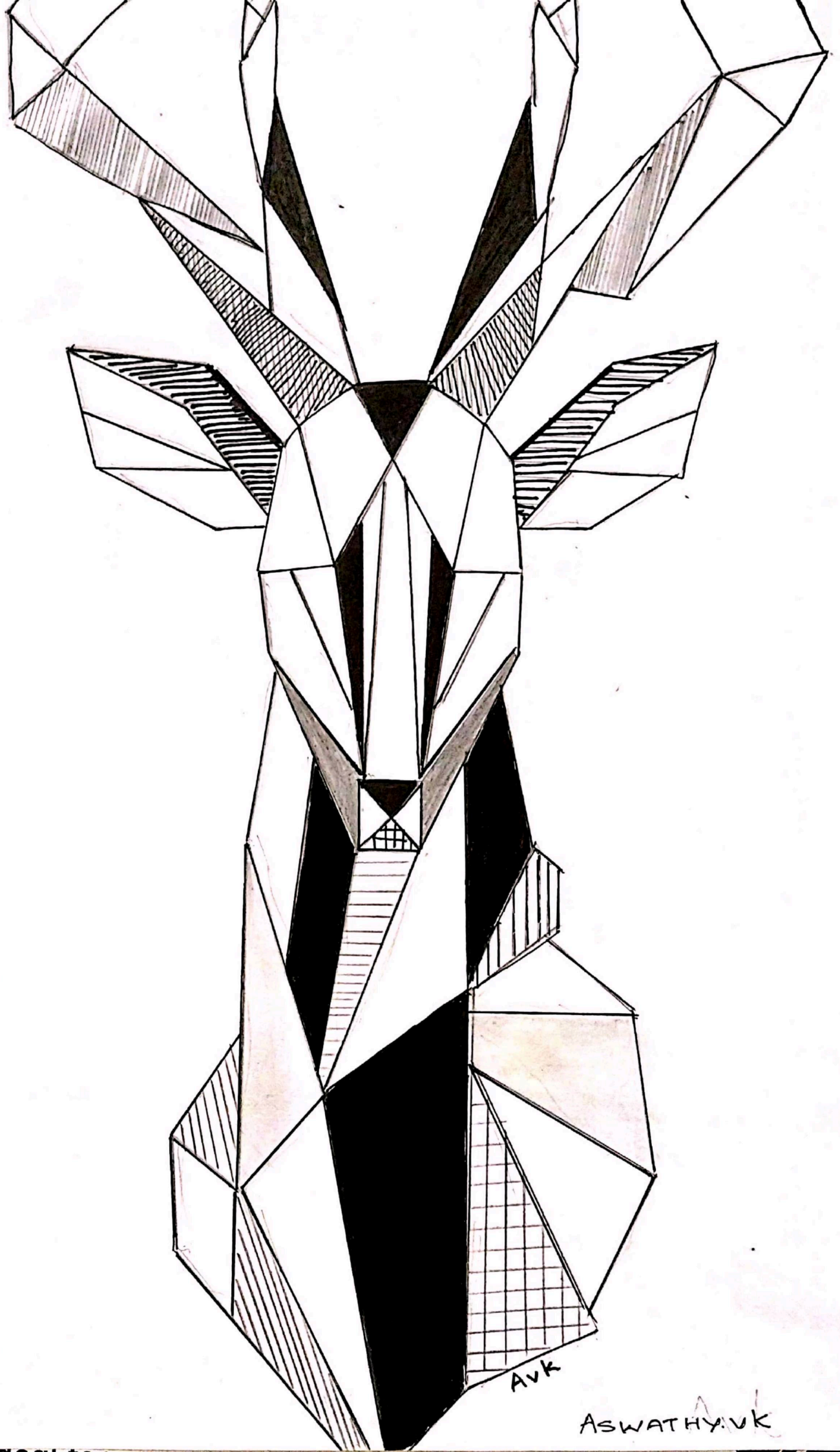


# MATH DANCE



NIRANJANA E.S





Avk

ASWATHY.VK



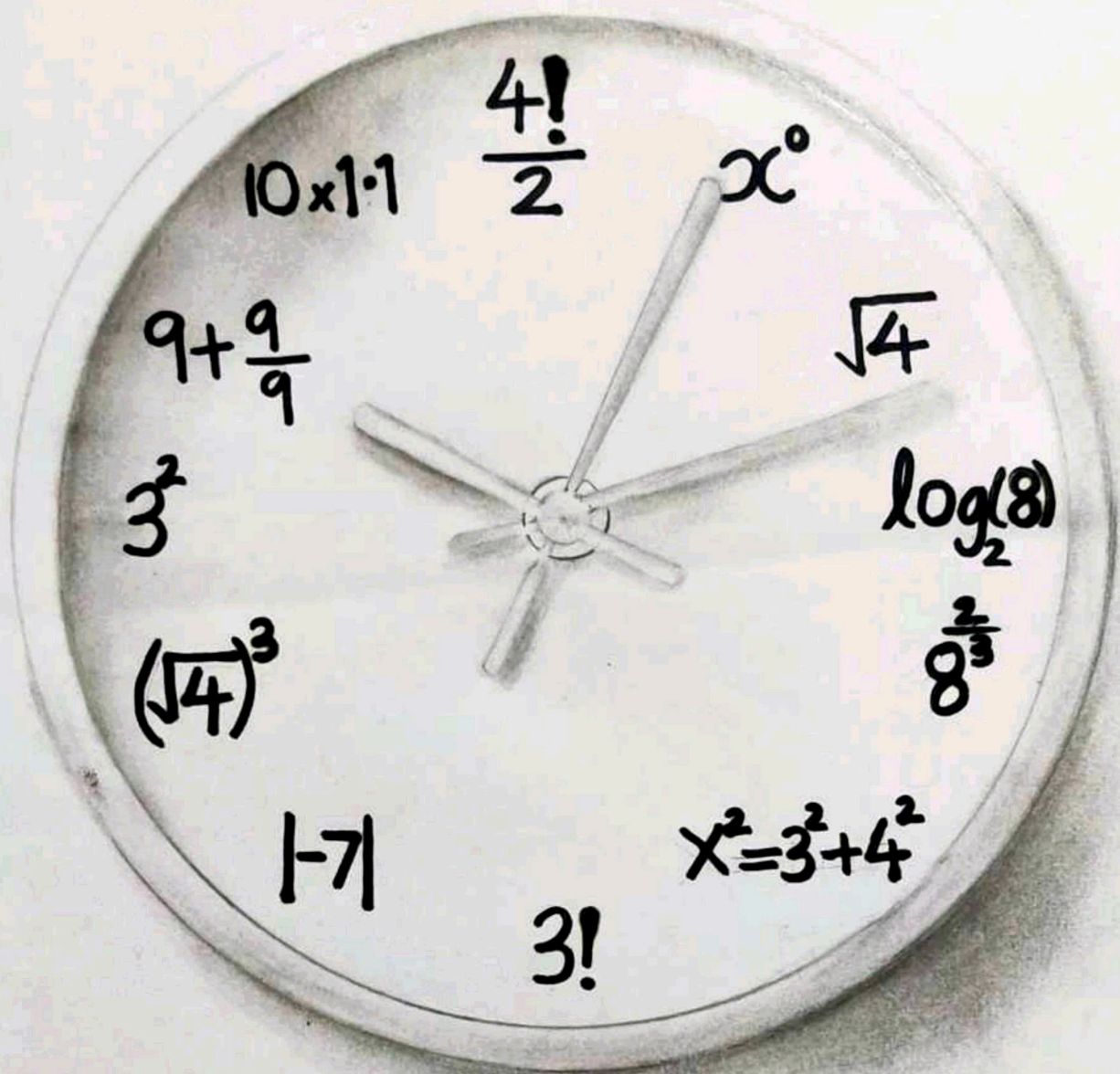
An equation means nothing to me  
unless it express a thought of God.

-SRINIVASA RAMANUJAN-



Jyothika Rajesh.





Without mathematics there's  
nothing you can do. Everything  
around you is mathematics.  
Everything around you is numbers.

Shakuntala Devi





U. Varada

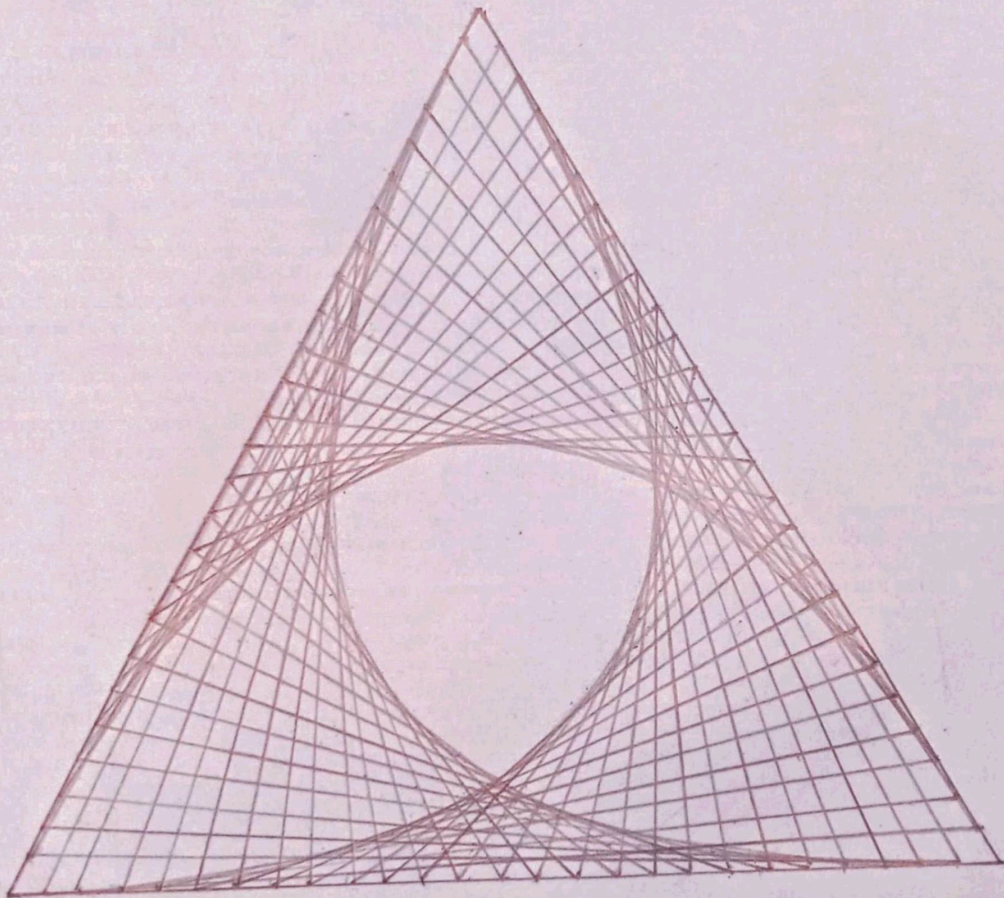




By Nya....

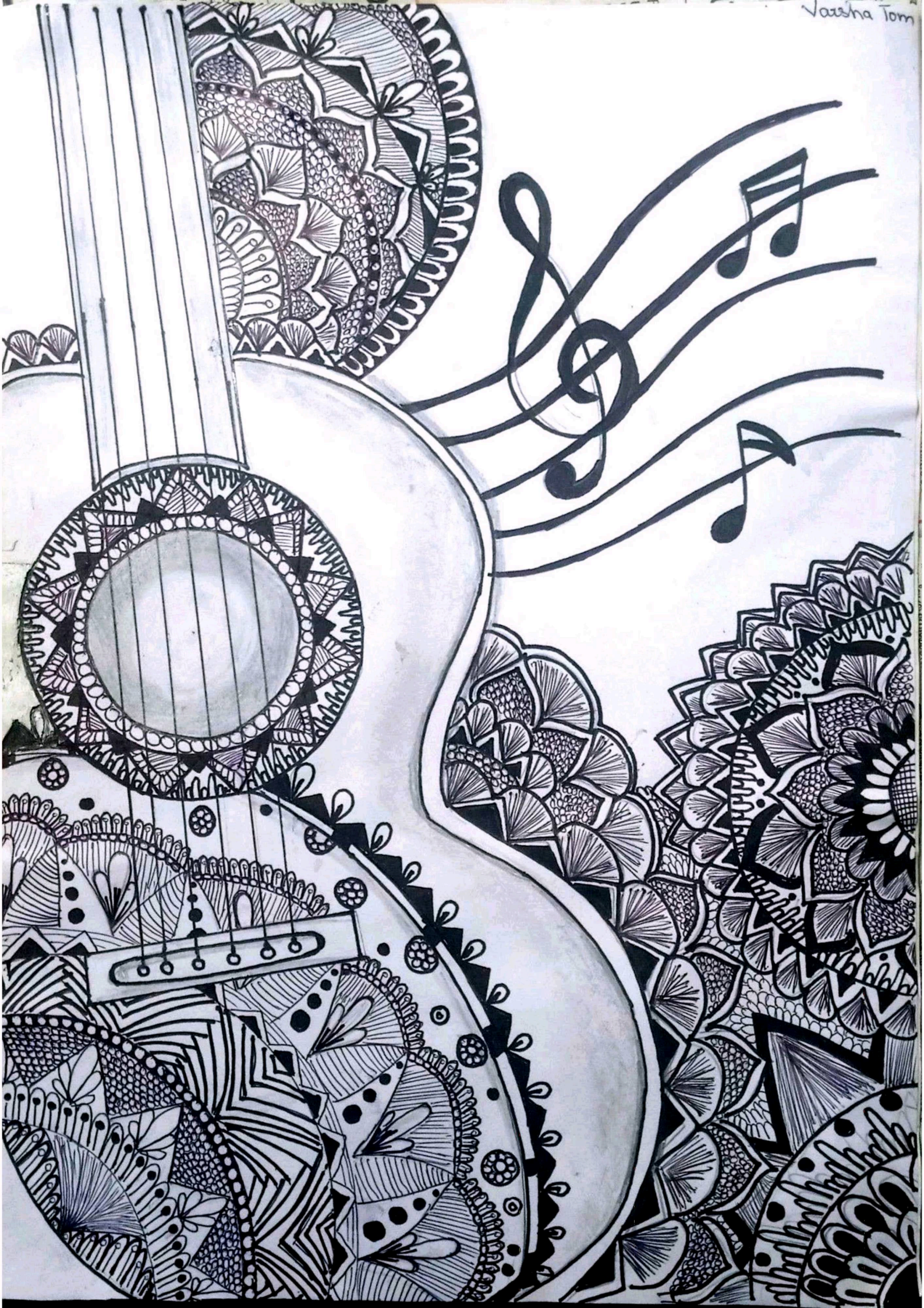


# Geometric pattern



Shamla N  
Bsc. Maths

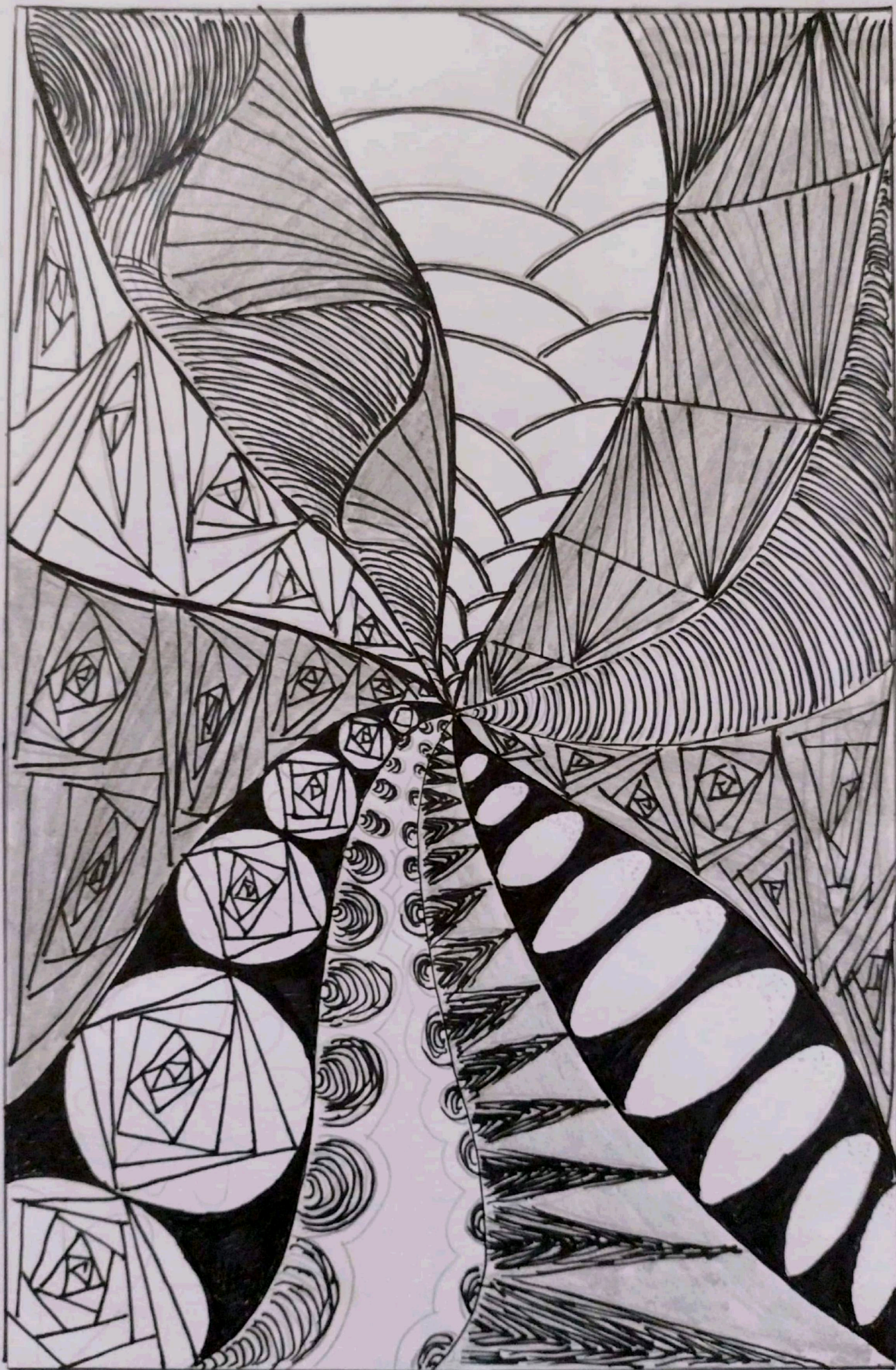






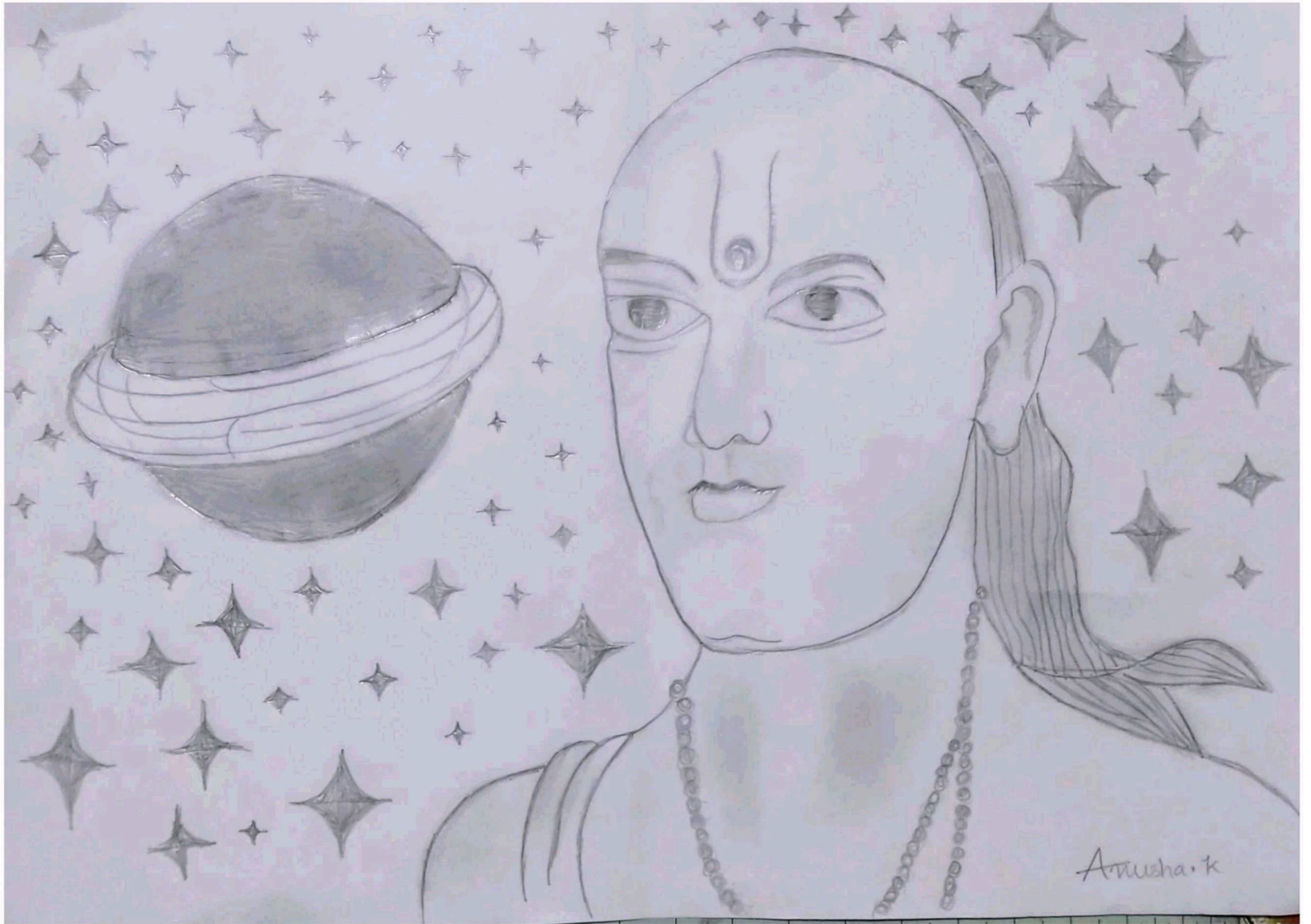




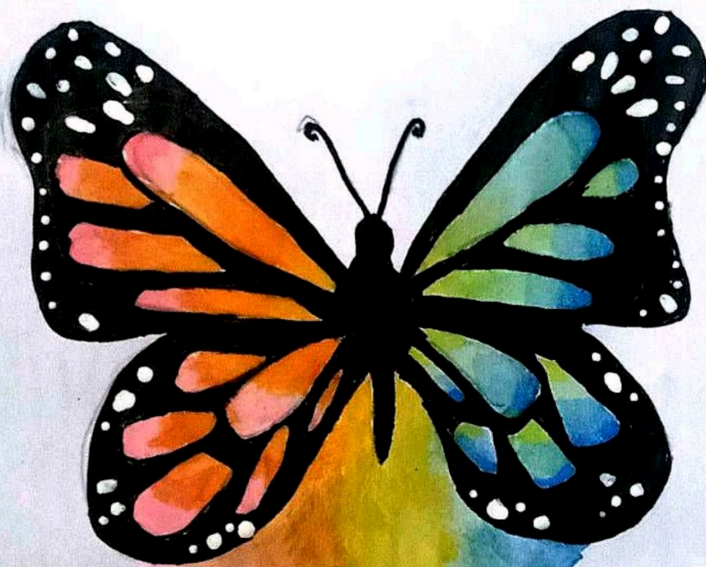


ASWATHY.VK









Butterfly said:

“If you can't  
fly high,  
Then fly free.”

Varsha Tom.







We

AMAL JOSEPH  
SREENATH V  
BHAVANA OK  
ASWATHY VK  
HRIDYA K  
AMAL P  
AISWARYA K  
HRIDYA ANOOP  
JEESHMA JAYRAJ  
JAISE GEORGE  
ANUSHA K  
RIYA PC  
ADVAITH KRISHNAN  
NANDANA KRISHNAN  
ADITHYA CP  
ABHISHEK JOSEPH  
SWATHI K  
U VARADA  
DEVIKA S VINOD  
JYOTHIKA RAJESH  
ATHIRA TV  
VARSHA TOM  
SHAMLA N  
STEPHY JOSEPH  
JIJIL VK  
PRANAV TV  
NAVNEETH PRAKASH  
AJIL SHAJI  
NIRANJANA ES  
ANJANA CV  
JUMANA PP  
ANURAG BK  
VARSHA P  
VARSHA K  
ALKA RAJEEV







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THANK YOU ALL