Delhi Public School Guwahati

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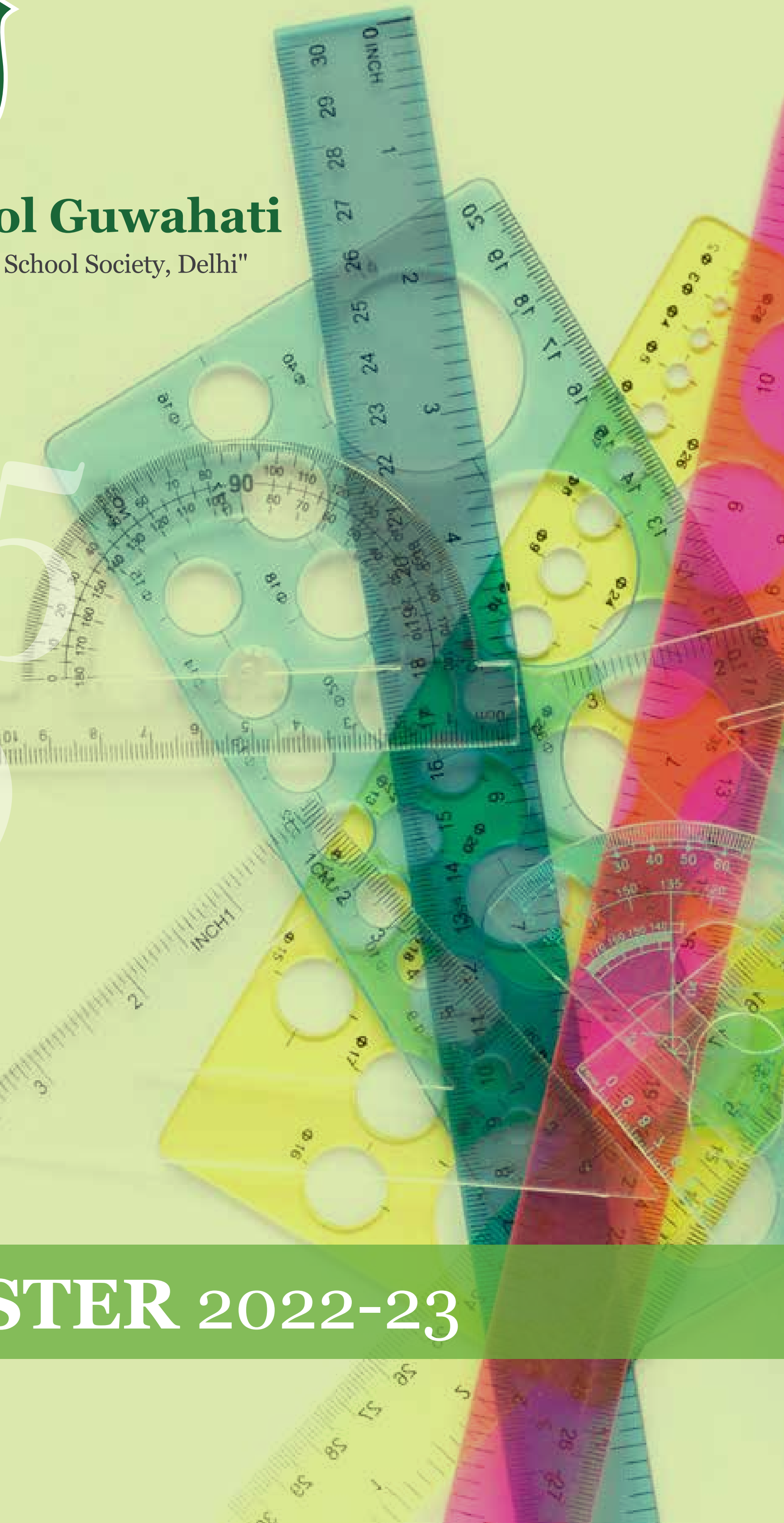
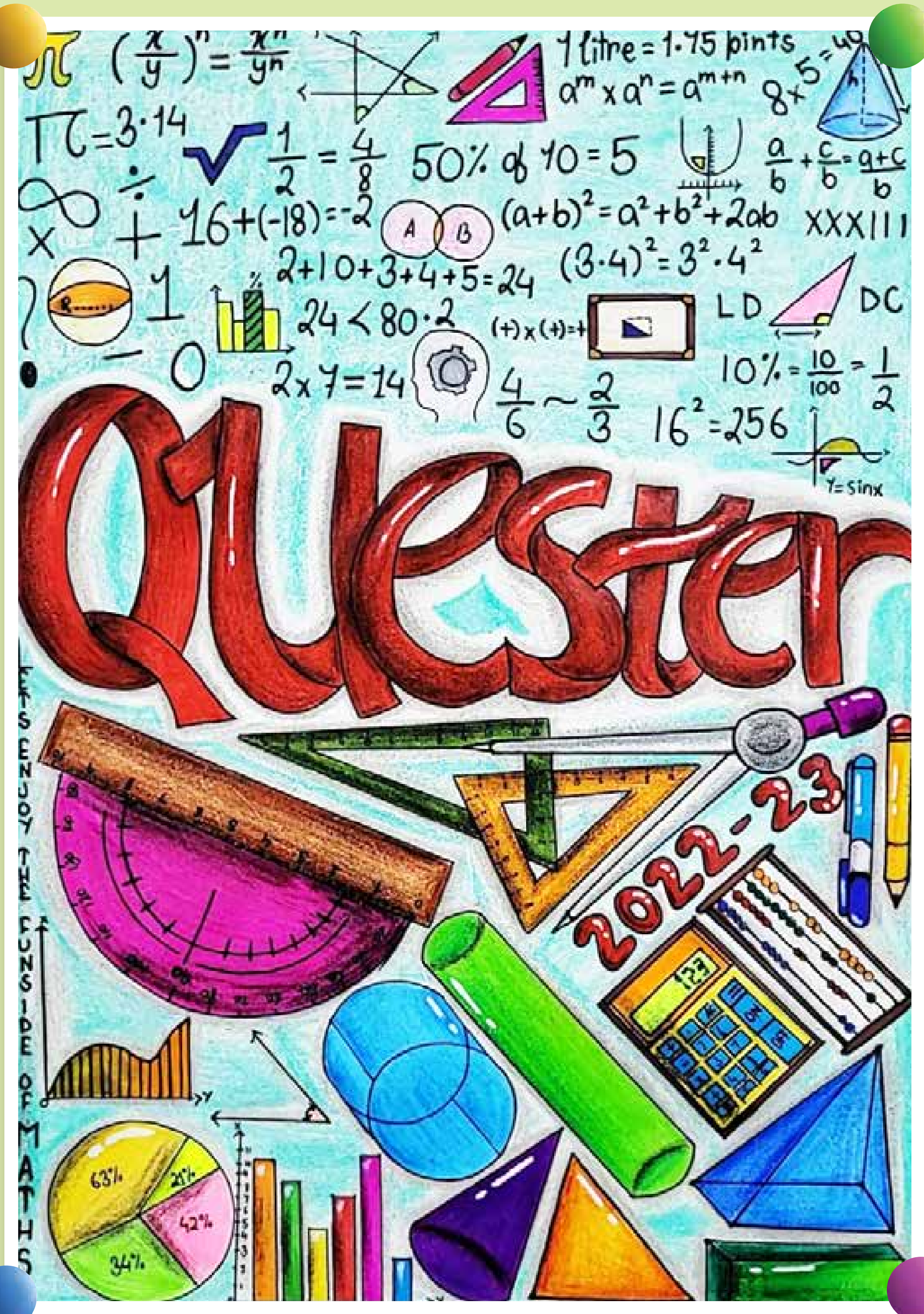


QUESTER 2022-23



Rishita Das
Class: VI B

The Desk of Principal

Chandralekha Rawat
Principal

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

-Albert Einstein

Mathematics as a discipline has its own intrinsic beauty and aesthetic appeal. It is more than numbers and calculations. It is a pathway to higher-level thinking and reasoning besides being a necessary skill that people use throughout their lives. Mathematics is a significant part of human logic and thoughts that plays a crucial role in creating mental discipline but also plays an important part in understanding the concepts of other subjects like science, social studies, and even music and art. The idea of Quester, the annual math magazine of Delhi Public School Guwahati was introduced with a view to popularizing mathematics and releasing what is called Numerophobia, arithmophobia or mathematics anxiety.

I am glad to know that the dedicated team of mathematics teachers along with the diligent students is bringing forth the tenth issue of Quester. The magazine, along with the other publications, besides celebrating the creativity of the children will go a long way to motivate and empower the students to be critical thinkers, and productive members of a dynamic global society.

I take this opportunity to thank the editorial team for all the hard work put in to compile the magazine and extend my best wishes to them.

Happy reading!

From the desk of HOD

Sanjay Mazumder
HOD, Deptt. of Mathematics

With the constant evolution of science and technology, the world of Mathematics has found a new dimension for the lovers of mathematics. The "Quester' is a means of bringing Mathematical wonders and discoveries of the world to the readers. Its primary aim is to bring Mathematics to everyone in a simplified manner and to make learning the subject more interesting and fun for all. Mathematics is the cradle of all creations. It makes a man methodical, systematic and orderly. It prevents chaos. Anyone can be mathematician with proper training and guidance in formative years of life.

It is with a great delight that the department of Mathematics of Delhi Public School Guwahati is presenting its 10th edition of our annual Maths magazine "Quester". Teachers and students take painstaking efforts to present the materials before you keeping in mind the diverse reach of mathematics in everyday life. Through this endeavour we have tried to provide a platform to the students as well as teachers of Delhi Public School Guwahati to give a new dimension to the subject –Mathematics.

The famous Mathematician Paul Halmos had rightly said:

"The only way to learn mathematics is to do mathematics".

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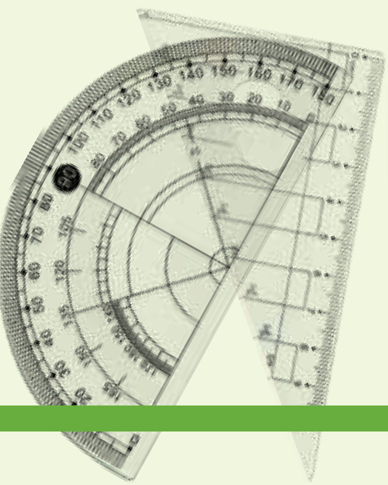
With best wishes to one and all.



The Desk of Editorial Board

Leena Choudhury
Editor

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

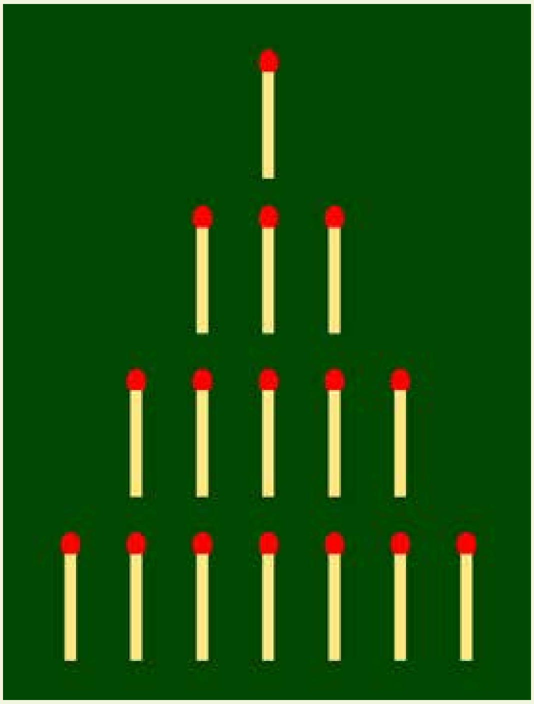
— Shakuntala Devi
(Indian writer and mental calculator)

It gives me immense pleasure to introduce the tenth edition of our maths magazine 'QUESTER'. It started in the year 2012 as a newsletter by the enormous efforts of our students.This year also the magazine has been designed and conceptualised by the students. Our aim is to encourage creativity of thought among students so that they may learn and grow in every aspect. In this publication, we offer a wide variety of articles which are contributions by the current students, with special write ups by the teachers. The edition of QUESTER also provides a glimpse of the Maths activities that have happened in this academic year.

Print media has always been a means of promoting creativity. Although quick technological tools exist for expression of ideas in today's world, but significance of print media cannot be denied. Information and facts are available everywhere but analytical elucidation is developed when writing takes place that leads to self-satisfaction. Magazine is a means to provide platform for students to come forward, identify their talent, discover their potential and move on the path of progress. It is supposed to garner diverse thoughts and expressions altogether. I am delighted to see that creative capacity of our students has been transformed into a tangible way in the form of 'QUESTER' as result of their tireless efforts and is presented for the feedback

We sincerely hope that the legacy of 'QUESTER' is carried on, with each edition being better than the last. We wish our readers have as great a time flicking through the pages of this magazine as we had creating it.

Ancient Games Of Mathematics



An ancient form of mathematics as a game is called “Nim”. It is believed that China is where the game first appeared. Nevertheless, the origin remains a mystery. The first allusions to Nim in Europe are from the early 16th century. The theory of the game was developed completely by Charles L. Bouton of Harvard University in 1901.

Two players take turns eliminating or “nimming” items from various heaps or piles in the mathematical strategy game known as “Nim”. The way the game is played is when a player must take away at least one object from the game on each turn, though they are allowed to take away as many as they like as long as they are all taken from the same heap or pile. The objective of the game is to either take or avoid taking the last object, depending on the version being played.

Another interesting game is called “Senet”. It is a popular board game which is said to have been first discovered in the First Dynasty burials in Egypt. The board’s fundamental composition consists of three rows of ten squares, with the final five squares always being embellished. Senet, which translates to “passing”, came to be understood as the path to the afterlife. Senet contains two sets of pawns with at least five of them each. The rules of this game is based on brief extracts that have lasted for over thousand of years. It is known to be a game of strategy, position and luck. Senet is also known as “ancient chess”.

Nausheen Amin
Class: VIII A

Conventional to Unconventionally Original- ‘The Vedic Mathematics’

Vedic Mathematics deals mainly with various Vedic mathematical formulae and their applications for carrying out tedious and cumbersome arithmetical operations, and to a very large extent, executing them mentally. In this field of mental arithmetical operations, the works of the famous mathematician Trachtenberg and Lester Meyers (High Speed Maths) are elementary compared to that of Jagadguruji.

Some may find it difficult, at first reading, to understand the arithmetical operations although they have been explained very lucidly by Jagadguruji. It is not because the explanations are lacking in any manner but because the methods are totally unconventional. Some people are so deeply rooted in the conventional methods that they probably, subconsciously reject to see the logic in unconventional methods.

Attempts has been made to explain the unconventional aspects of the methods. Once the reader gets used to the unconventional in the beginning itself, he would find no difficulty in the later parts.

Vedic Mathematics is the name given to the ancient system of Indian Mathematics which was rediscovered from the Vedas between 1911 and 1918 by Sri Bharati KrisnaTirthaji former Jagadguru Sankaracharya(1884-1960). According to his research all of mathematics is based on sixteen Sutras and13 Sub - Sutras (corollaries), or word-formulae. For example, ‘Vertically and Crosswise` is one of these Sutras. These formulae describe the way the mind naturally works and are therefore a great help in directing the appropriate method of solution. Vedic Mathematics manifests the coherent and unified structure of mathematics and the methods are complementary, direct and easy.

The 16 Sutras and sub-sutras(corollaries) of Vedic Math

1. Ekadhikina Purvena
   (Corollary: Anurupyena)
   Meaning: By one more than the previous one

2. Nikhilam NavatashcaramamDashatah
   (Corollary: Sisyate Sesasamjnah)
   Meaning: All from 9 and the last from 10

3. Urdhva-Tiryagbyham
   (Corollary: Adyamadyenantyamantyena)
   Meaning: Vertically and crosswise

4. ParaavartyaYojayet
(Corollary: Kevalaih Saptakam Gunyat)
Meaning: Transpose and adjust

5. Shunyam Saamyasamuccaye
(Corollary: Vestanam)
Meaning: When the sum is the same that sum is zero

6. (Anurupye) Shunyamanyat
(Corollary: Yavadunam Tavadunam)
Meaning: If one is in ratio, the other is zero

7. Sankalana-vyavakalanabhyam
(Corollary: Yavadunam Tavadunikritya Varga Yojayet)
Meaning: By addition and by subtraction

8. Puranapuranabyham
(Corollary: Antyayordashake'pi)
Meaning: By the completion or non-completion

9. Chalana-Kalanabyham
(Corollary: Antyayoreva)
Meaning: Differences and Similarities

10. Yaavadunam
(Corollary: Samuccayagunitah)
Meaning: Whatever the extent of its deficiency

11. Vyashtisamanstih
(Corollary: Lopanasthapanabhyam)
Meaning: Part and Whole

12. Shesanyankena Charamena
(Corollary: Vilokanam)
Meaning: The remainders by the last digit

13. Sopaantyadvayamantyam
(Corollary: Gunitasamuccayah Samuccayagunitah)
Meaning: The ultimate and twice the penultimate

14. Ekanyunena Purvena
(Corollary: Dhvajanka)
Meaning: By one less than the previous one

15. Gunitasamuchyah
(Corollary: Dwandwa Yoga)
Meaning: The product of the sum is equal to the sum of the product

16. Gunakasamuchyah
(Corollary: Adyam Antyam Madhyam)
Meaning: The factors of the sum is equal to the sum of the factors.

SOME EXAMPLES OF VEDIC MATHEMATICS' TRICKS:

1. For any integer ending with 5, the square always ends with 25 and begins with the multiple of previous integer and one more than the integer. For example:
- Square of 25 is 2 x 3 .. 25 = 625.
- Square of 85 is 8 x 9 .. 25 = 7225

2. For multiplication of any numbers near to less than multiple of 10,
- Step 1: Subtract the numbers with their closest multiple of 10 and multiply the results.
- Step 2: Subtract the results with other numbers.

- Step 3: Write the result of Step 2 in the beginning and result of Step 1 at the end.
  For example: 99 x 96 = ?
  100 – 99 = 1 and 100 – 96 = 4
  1 x 4 = 04
  99 – 4 or 96 – 1 = 95
  95 and 04
  So, the answer is 9504

3. For solving equations in the forms given below:

   ax + b = cx + d
   So, x = d – b/a – c
   (x+a)(x+b) =(x+c)(x+d)
   So, x = cd-ab/a+b-c-d

   A term which occurs as a common factor in all the terms is equated to zero e.g.: 14x + 9x = 4x + 12x. Here x occurs as a common factor with all terms and hence the value of x according to this sutra is zero.

   If the product of the independent term on either side of the equation is equal the value of the variable will be zero, which is the second interpretation of this sutra.

   E.g.
   (x +8) (x+3) = (x + 12) (x + 2)
   8 x 3 = 24 = 12 x 2 and hence value of x in this equation would be 0

4. To find the factors of a perfect number

   For example, to find the factors of number 28,
   1 x 28= 28
   2 x 14 = 28
   4 x 7 = 28

   So, in this case, the sum of factors is 1+2+4+7+14 = 28

   The sum of factors equals the factor of the sums, so 28 is said to be a perfect number.

5. For multiplication of any two two-digit numbers,

- Step 1: Multiply the last digit
- Step 2: Multiply numbers diagonally and add them.
- Step 3: Place Step 1 at the end and Step 2 at the beginning.
- Step 4: Multiply the first digit of both the number and put it at the most beginning.
- Step 5: For the result, more than 2 or more digits, add the beginning digits to the beginning numbers.
  Example: 14 x 12 =?
  4 x 2 = 8
  (1 x 2) + (4 x 1) = 6
  1 x 1 = 1
  14 x 12 = 168

Prajnalika Deka
Class: XI A

Explore Maths In Your Own Way

“The beginning of greatness is to be different and the beginning of failure is to be same”. This quote makes us think if we are exploring enough to create something different and new. Children these days are following the concepts or tricks that already exist. They aren’t trying to think or find new ways to solve a given task. Continuous thinking, to find an easier way to a problem, may lead one to a solution which is easier, simpler and out of the box.
Here is an alternative way that may help one to reach the square root of any number.
Let us take a number.

Step 1. Find the perfect square number which is just less than and greater than the given number.
Step 2. Find the difference between the third and first number. Also Find the difference between the second and first number.
Step 3. Divide the later difference by former difference.
Step 4. Square root of the given number = Perfect square number just less than the given number + result obtained in step 3.

Illustration 1. Find the square root of 56.

Step 1. $\sqrt{49}=7$
$\sqrt{56}=?$
$\sqrt{64}=8$

Step 3. $\frac{7}{15}=0.466$

Step 2. First number = 49
Second number = 56
Third number = 64
Third number - First number = 64 - 49 = 15
Second number - First number = 56 - 49 = 7

Step 4. $\sqrt{56}=7+0.466=7.47$ (approx).

Illustration 2. Find the square root of 65.2.

Step 1. $\sqrt{64}=8$
$\sqrt{65.2}=?$
$\sqrt{81}=9$

Step 3. $\frac{1.2}{17}=0.07$

Step 2. First number = 64
Second number = 65.2
Third number = 81
Third number - First number = 81 - 64 = 17
Second number - First number = 65.2 - 64 = 1.2

Step 4. $\sqrt{65.2}=8+0.07=8.07$ (approx).

Shekhar Kumar Dey
(Maths Dept.)

Fibonacci Numbers

A Fibonacci number is a series of numbers in which each Fibonacci number is obtained by adding the two preceding numbers. It means that the next number in the series is the addition of the two previous numbers. The Fibonacci numbers were first discovered by a man named Leonardo Pisano whose nickname was Fibonacci. Fibonacci sequence of numbers is very close to the golden ratio "Φ" which is manifested in nature and in certain works of art.

FIGURE 1: - LEONARDO PISANO/ FIBONACCI

FIBONACCI SEQUENCE

The sequence of Fibonacci numbers can be defined as, Fn = Fn -1 + Fn – 2.

Where fn is the nth term, fn – 1 is the (n -1) th term, fn – 2 is the (n -2)th term.

The Fibonacci sequence is a very well-known and studied sequence of numbers which is often used in schools and recreational mathematics.

Let the first two numbers in the series be taken as 0 and 1. By adding 0 and 1, we get the third number, i.e., 1 and 1, we get the fourth number as 2, and similarly, the process goes on. Thus, we get the Fibonacci series as 0,1,1,2,3,5,8 and so on.

The first 20 Fibonacci numbers are given as follows-

$F_0 = 0$	$F_{10} = 55$
$F_1 = 1$	$F_{11} = 89$
$F_2 = 1$	$F_{12} = 144$
$F_3 = 2$	$F_{13} = 233$
$F_4 = 3$	$F_{14} = 377$
$F_5 = 5$	$F_{15} = 610$
$F_6 = 8$	$F_{16} = 987$
$F_7 = 13$	$F_{17} = 1597$
$F_8 = 21$	$F_{18} = 2584$
$F_9 = 34$	$F_{19} = 4181$

FIBONACCI NUMBER PROPERTIES:

The following are the properties of the Fibonacci numbers.

(i) In the Fibonacci series, we have to take three consecutive numbers and add those numbers. When we divide the result by 2, we will get the three numbers. For example, if we take 3 consecutive numbers such as 1, 2, 3, and add these numbers, i.e., 1 + 2 + 3 = 6. And when 6 is divided by 2, the result is 3.

(ii) If we take four consecutive numbers other than "0" in the Fibonacci series, and multiply the outer number and also multiply the inner number and subtract these numbers, we will get the difference "1".

For example, 2,3,5,8 are four consecutive Fibonacci numbers. If we multiply the outer numbers i.e., 2(8) and multiply the inner numbers, i.e., 3(5), we will get

16 and 15. And after subtracting these two numbers, i.e., 16 – 15 = 1. Thus the difference is 1.

FIBONACCI PATTERNS FOUND IN PLANTS

(a) PETALS OF FLOWERS: -

Fibonacci patterns can be seen in the arrangement of petals on the beautiful flowers of nature.

FIGURE 2:- FIBONACCI PATTERNS IN FLOWERS

(b) LEAVES OF PLANTS

Plants show the Fibonacci numbers in the arrangement of their leaves. Three clockwise rotation, passing five leaves two counter-clock-wise rotation. In the case of leaf arrangement, or phyllo taxis, some of the cases may be related to maximizing the space for each leaf, or the average amount of light falling on each one.

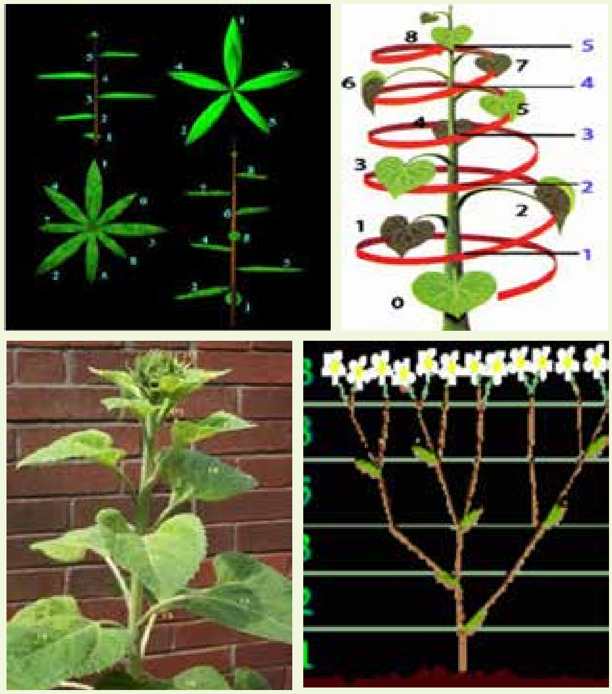


FIGURE 3 :- FIBONACCI PATTERNS IN LEAVES

(c) FIBONACCI SPIRAL:

The Fibonacci numbers are found in the arrangement of seeds on flower heads. Seeds in a sunflower follow the pattern of the Fibonacci sequence. They form clockwise spirals that reach the outer edge and will usually find a pair of numbers from sequence 34 and 35 or 55 and 89, or with very large sunflowers- 89 and 144.

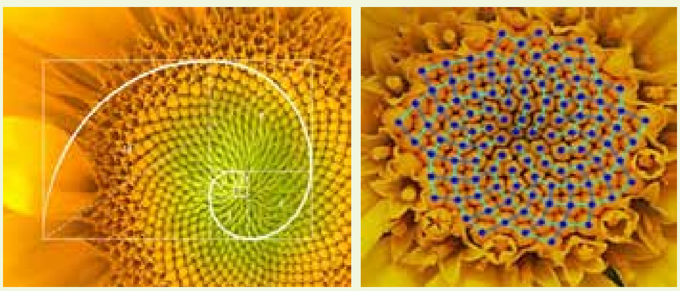


FIGURE 4:- FIBONACCI SPIRAL IN SUNFLOWER

FIBONACCI PATTERNS FOUND IN HUMAN BODY

Humans exhibit fibonacci characteristics. Every human has two hands, each one of those has five fingers and each finger has three parts which are separated by two knuckles. All of these numbers fit into the sequence. Moreover the lenghts of bones in a hand are in Fibonacci numbers.

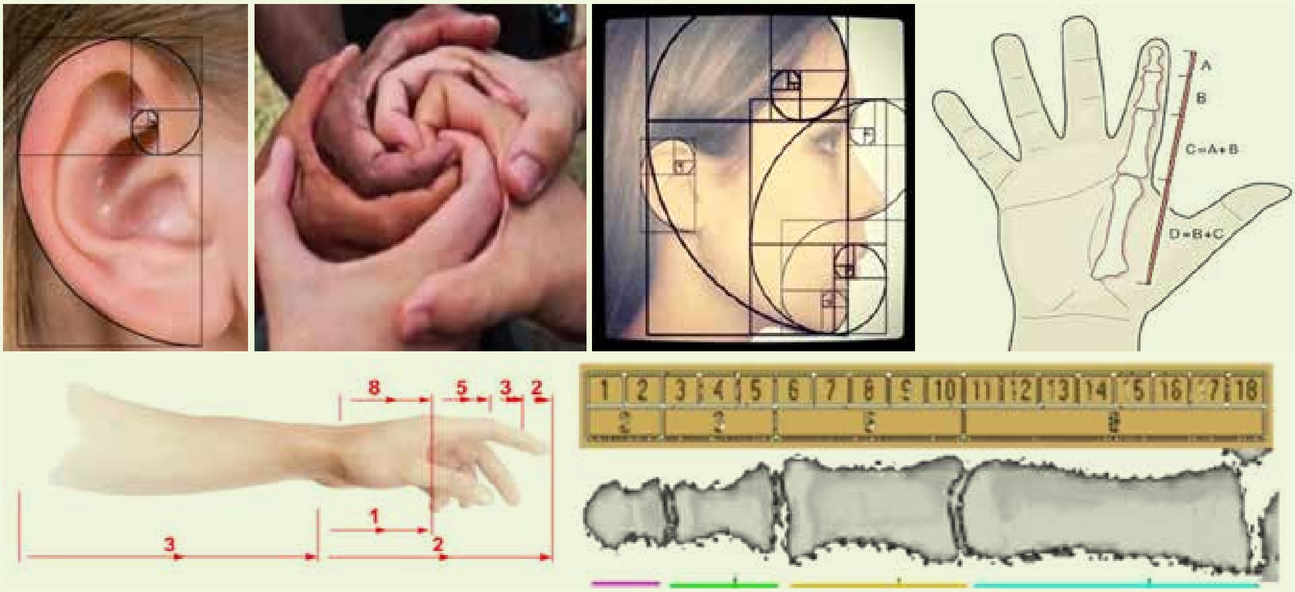


FIGURE 5:- FIBONACCI PATTERNS IN HUMAN BODY

FIBONACCI PATTERNS IN DIFFERENT THINGS OF NATURE

Fibonacci spiral can be found in cauliflower. It can also be found in pineapples and bananas. Bananas have 2 or 5 sides and pineapple scales have Fibonacci spirals in sets of 8, 13 and 21. Infect inside the fruit of many plants we can observe the presence of Fibonacci order. Fibonacci spiral are also found in various fields associated in nature, such as in snail, sea shells, waves, eggs, combination of colours etc.

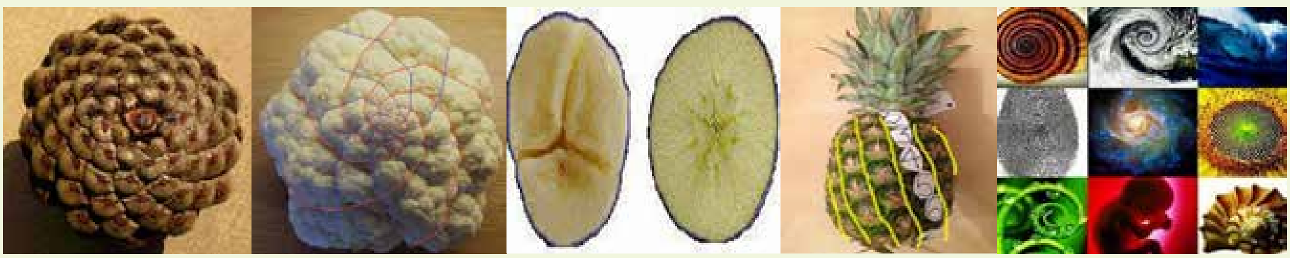


FIGURE 6: - FIBONACCI PATTERNS IN DIFFERENT THINGS OF NATURE

FIBONACCI'S RABBIT EXPERIMENT

In the west, the Fibonacci sequence first appears in the book Liber Abaci (1202) by Leonardo of Pisa, known as Fibonacci. The puzzle of rabbits explain the wonder behind this Fibonacci series. Fibonacci considers the growth of an idealized (biologically unrealistic) rabbit population, assuming that:

(i) Two new-born rabbits are left in the field. They are still one pair at the end of the first month.

(ii) The first pair produces the second pair, but the second pair is left without breeding, so 3 pairs in all at the end of the third month.

(iii) The original pair produces another pair, the second pair produces their first pair and the third pair remains without breeding, making 5 pairs.

(iv) The sequence continues in this pattern and at the end of the nth month, the number of rabbits in the field is equal to the sum of the number of mature pairs(n – 2)th month and the number of pairs alive last month (n – 1)th month. This happens to be nth Fibonacci number.

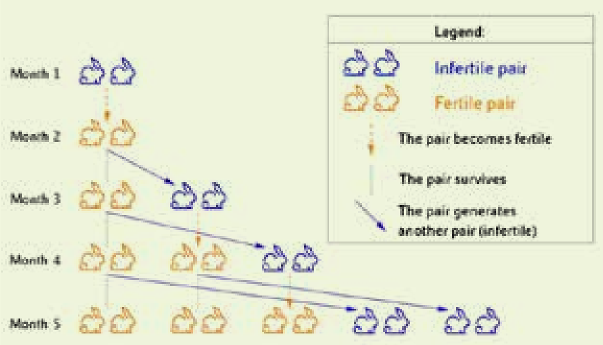


FIGURE 7:- FIBONACCI'S RABBIT EXPERIMENT

FIBONACCI IN MUSIC

The Fibonacci sequence of numbers and the golden ratio are manifested in music widely. The numbers are present in the octave, the foundational unit of melody and harmony. Example:- The intervals between keys on a piano of the same scales are Fibonacci numbers.

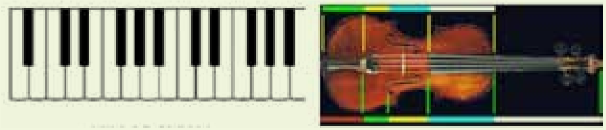


FIGURE 8:- FIBONACCI SEQUENCE IN MUSIC

FIBONACCI NUMBERS IN PASCAL'S TRIANGLE

The Fibonacci numbers are also applied in Pascal's Triangle. Entry is sum of two numbers either side of it, but in the row above. Diagonal sums in Pascal's Triangle are the Fibonacci numbers.

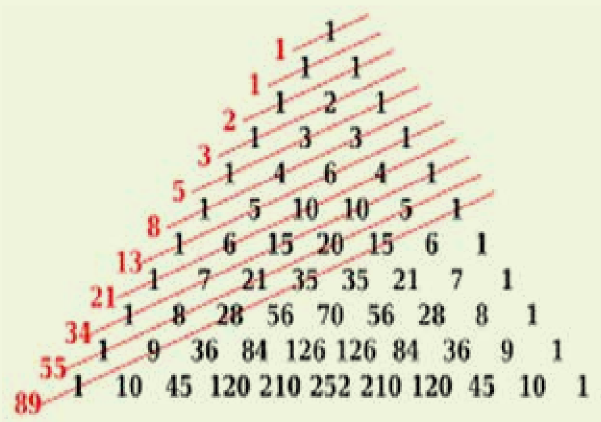


FIGURE 9:- PASCAL'S TRIANGLE

GOLDEN RATIO

(i) Fibonacci numbers are related to the golden ratio. Any Fibonacci number can be calculated using the golden ratio, $F_n = (\Phi n-(1-\Phi)^n)/\sqrt{5}$, Here Φ is the golden ratio and $\Phi \approx 1.618034$. To find the 7^{th} term, we apply $F_7 = [(1.618034)^7 - (1.618034)^7]/\sqrt{5} = 13$.

(ii) The ratio of successive Fibonacci numbers is called the "Golden ratio".

SOME APPLICATION OF GOLDEN RATIO

Fibonacci spiral starts with a rectangle whose length and width form the golden ratio (≈1.618). This rectangle is partitioned into two squares. Then the squares are further partitioned, connecting the corners of the boxes, the spiral is drawn inside these squares. The larger the numbers in the Fibonacci sequence, the ratio becomes closer to the golden ratio.

FIGURE 10:- GOLDEN RATIO

When we make squares with these widths, we get a nice spiral. For example: 5 and 8 make 13, 8 and 13 make 21, and so on.

Leonardo da Vinci should that in a 'perfect man' there were lots of measurements that followed the golden ratio.

The golden ratio is widely used in geometry. It is the ratio of the side of a regular pentagon to its diagonal. The diagonals cut each other with the golden ratio. Pentagram describes a star which forms parts of many flags. This five-point symmetry with golden proportions is found in starfish which has five arms

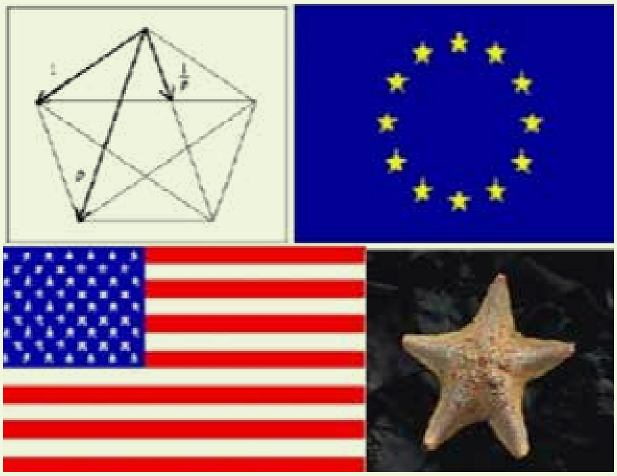


FIGURE 11: - GOLDEN RATIO IN GEOMETRY

The eyes, fins and tail of the dolphin fall at golden sections along the body.

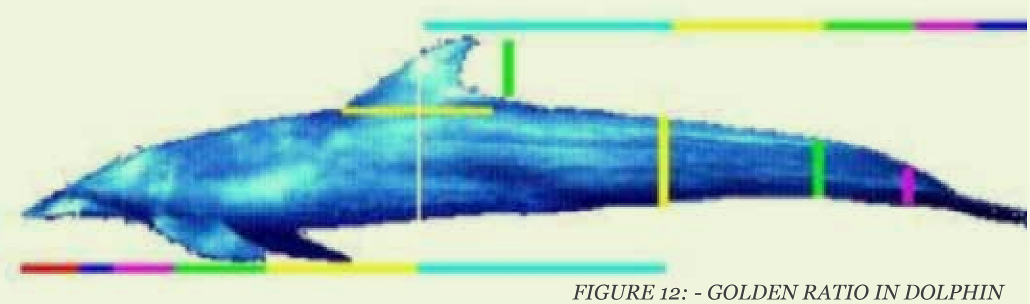


FIGURE 12: - GOLDEN RATIO IN DOLPHIN

The golden ratio is also frequently seen in natural architecture. It can be found in the great pyramid in Egypt. Perimeter of a pyramid, divided by twice its vertical height is the value of Φ. Golden section appears in many of the proportions of the Parthenon in Greece. Front elevation is built on the golden section(0.618 times as wide as it is tall.

FIGURE 13:- GOLDEN RATIO IN NATURAL ARCHITECTURE AND IN MONUMENTS

FIBONACCI IN CODING

Fibonacci sequence and golden ratio are of great interest to the researchers in many fields of science incuding high energy physics, quantum mechanics, cryoptography etc.

It is used in coding like, computer algorithms, interconnecting parallel, and ditributed systems. Fibonacci in coding is important or popular because it provides a base case and allows a program to repeat the same steps to solve the problem repeatedly.

Fibonacci coding encodes an integer into binary number using Fibonacci representation of the number.

In mathematics and computing, Fibonacci coding is a universal code which encodes positive integers into binary code words. It is one example of representations of integers based on Fibonacci numbers.

CONCLUSION

The Fibonacci sequence is a series of numbers that follow a unique integer sequence, These numbers generate mathematical patterns that can be found in all aspects of life. The patterns can be seen in everything from the human body to the physiology of plants and animals. If we study the pattern of various natural things minutely we observe that many of the natural things around us follow the Fibonacci numbers. They are appearing as a by-product of a deeper physical process. That is why the spirals are imperfact. The plant is responding to physical constraints, not to a mathematical rule.

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- Images taken from google.

Sneha Deka
Class: IX E

Students Experience On Maths Activity

“It was a great experience in doing all the Maths activities. We learnt a lot of new things and tricks of solving maths. Many things which we have learnt in our books and had to imagine in our minds, easily could be visualized practically through these activities. Me and my friends enjoyed a lot while doing these activities. We mostly did cutting and pasting which was very creative. The teachers also helped us a lot by giving their ideas.”

Angana Bora

Class: VIII E

“Maths activity was a fun time for us. As I love to do craft work very much, it gave me immense pleasure in doing all the paper cutting and pasting work. It was not at all a hard or difficult work to do. We learnt many things from various aspects of maths like Fractions, 3D shapes, Tangrams, Symmetry etc. practically through these activities.”

Simi Das

Class: VIII F

20 Interesting Facts About Maths

1. The two sentences, “twelve plus one” and “eleven plus two”, both have 13 letters.
2. If we add a number with its immediate predecessor we shall get a sequence which is called Fibonacci Series.
   0,1,1,2,3,5,8,13,21,34..........
3. A palindrome number is a number that reads the same forward and backward. For example, 34543. Some interesting examples are
   1x1=1,
   11x11=121,
   111x111=12321,
   1111x1111=1234321
   11111x11111=123454321
4. People believe in the unlucky 13 because on the Last Supper Christ had 13 guests, with Iscariot being the 13th one. He betrayed Jesus and encouraged his crucifixion.
5. Indian Vs International Number System

Indian System	Figures (Indian)	International System	Figure (International)	Power notation
Unit	1	One	1	100
Ten	10	Ten	10	101
Hundred	100	Hundred	100	102
Thousand	1,000	Thousand	1,000	103
Ten Thousand	10,000	Ten Thousand	10,000	104
One Lakh	1,00,000	Hundred Thousand	100,000	105
Ten Lakh	10,00,000	One Million	1,000,000	106
One Crore	1,00,00,000	Ten Million	10,000,000	107
Ten Crore	10,00,00,000	Hundred Million	100,000,000	108
One Arab	1,00,00,00,000	One Billion	1,000,000,000	109
Ten Arab	10,00,00,00,000	Ten Billion	10,000,000,000	1010
One Kharab	1,00,00,00,00,000	Hundred Billion	100,000,000,000	1011
Ten Kharab	10,00,00,00,00,000	One Trillion	1,000,000,000,000	1012
One Neel	1,00,00,00,00,00,000	Ten Trillion	10,000,000,000,000	1013
Ten Neel	10,00,00,00,00,00,000	Hundred Trillion	100,000,000,000,000	1014
One Padma	1,00,00,00,00,00,00,000	One Quadrillion	1,000,000,000,000,000	1015
Ten Padma	10,00,00,00,00,00,00,000	Ten Quadrillion	10,000,000,000,000,000	1016
One Sankh	1,00,00,00,00,00,00,00,000	Hundred Quadrillion	100,000,000,000,000,000	1017
Ten Sankh	10,00,00,00,00,00,00,00,000	One Quintillion	1,000,000,000,000,000,000	1018
One Mahasankh	1,00,00,00,00,00,00,00,00,000	Ten Quintillion	10,000,000,000,000,000,000	1019

		Hundred Quintillion		1020
		Sextillion		1021
		Septillion		1024
		Octillion		1027
		Nonillion		1030
		Decillion		1033

6. Every odd number has “e” in its spelling.
7. There is no zero (0) in Roman numerals. The entire number system is generated by the seven different letters, namely I, V, X, L, C, D and M. Using these, we can write numbers up to 3999.
8. In the decimal number system, there are 10 digits from 0 to 9. It is also known as the Hindu Arabic numeral system, invented more than 1000 years ago.
9. In the entire Hindu Arabic number system, there is only one number which can be spelled with the same number of letters as itself. That number is FOUR.
10. FORTY is the only number that is spelt with letters arranged in alphabetical order.
11. ONE is the only number that is spelt with letters arranged in descending order.
12. 2 is the only natural number satisfying 2 + 2 = 2 × 2.
13. In the Indian number system, when we write numbers from 0 to 1000, letter A only appears first in the spelling of 1000 (one thousand).
14. The hour and minute hand of a clock coincide 22 times in a day.
15. Take any number and multiply it by three. Now find the sum of the digits in the answer. It is always divisible by 3. For example, consider 17. Multiply it by 3 to obtain 17 × 3 = 51 and the sum of digits = 5 + 1 = 6. Clearly, 6 is divisible by 3.
16. Number 9 is known as the magic number. This is because the digital sum of digits (sum of digits till we get a single digit) of any multiple of 9 is always 9. For example,
    9×1=9
    9×2=18 (1+8=9)
    9×3=27 (2+7=9)
    9×4=36 (3+6=9)
    And so on.....
17. Another interesting fact with the number 9. When we add the product of any number and 9 with the sum of that number and 9, the result is always a 2-digit number with 9 in the unit’s place and the other number in the ten’s place. For example,
    (1×9) + (1+9) = 19
    (2×9) + (2+9) = 29
    (3×9) + (3+9) = 39
    (4×9) + (4+9) = 49
    And so on......
18. Seven is the most significant number across all religions and cultures. For example, seven colours in a rainbow, seven days in a week, seven notes on the musical skill, etc.
19. The signs Plus (+) and Minus (-) were discovered as early as in 1489 A.D.
20. A standard football is made up of Pentagons and Hexagons. There are 12 pentagons and 20 hexagons.

Pavika Deb
Class: IV D

MAGIC NUMBERS!!!!

- √ PICK A NUMBER
- √ DOUBLE IT
- √ ADD 10
- √ DIVIDE BY 2
- √ SUBTRACT THE FIRST NUMBER
- √ THE ANSWER IS 5

THIS IS A MIND TRICK!!!

- ➢ THINK OF A NUMBER
- ➢ DOUBLE THE NUMBER
- ➢ ADD EIGHT
- ➢ MINUS HALF THAT NUMBER
- ➢ MINUS THE NUMBER YOU STARTED WITH

THE ANSWER IS 4

FIND THE ANSWER

$1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 \times 0 + 1 = ?$

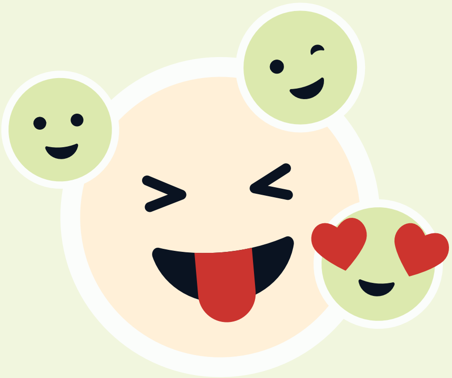
FIND THE VALUE

1) $4 + 4 = 20$
2) $5 + 5 = 30$
3) $6 + 6 = 42$
4) $7 + 7 = 56$

THEN, WHAT IS $9 + 9 =$?????

MATHEMATICS

Marvellous multiplication
Alluring arithmatics
Tantalizing tangrams
Hypnotizing hypotenuses
Enticing equations
Mesmerizing monomials
Amazing angles
Thrilling trigonometry
Inventive inequalities
Creative coordinates
Solving sums



MATHS ALWAYS HAS A SOLUTION

MATH may not teach us how to **ADD** love or **SUBTRACT** hate but it gives us hope that **EVERY PROBLEM** has a **SOLUTION**.

SO SAD……

Why is the maths textbook so sad??????

Because it has so many problems in it.

Aarhant Kashyap
Class: V B

Do you know what comes after million, billion and trillion?
Look at the table below!

1	10^{6}	Million
2	10^{9}	Billion
3	10^{12}	Trillion
4	10^{15}	Quadrillion
5	10^{18}	Quintillion
6	10^{21}	Sextillion
7	10^{24}	Septillion
8	10^{27}	Octillion
9	10^{30}	Nonillion
10	10^{33}	Decillion

Greek Letters In Mathematics

Greek letters are often used to represent functions in mathematics and science. The name phi, theta and kappa was taken from the initial letters of the three Greek words meaning “wisdom”, “aspiration” and “purity”.

The Greek alphabet is used extensively in mathematics and physical sciences to stand for well known constants, variables, functions and so forth.

GREEK ALPHABET CHARACTERS AND SYMBOLS LIST

Greek Letter	Greek	Symbol	Used To Denote
	Capital	Small	
Alpha	Α	Α	Angles, coefficients, attenuation constant, absorption factor, area
Beta	Β	Β	Angles, coefficients, phase constant
Gamma	Γ	Γ	Complex propagation constant (cap), specific gravity, angles, electrical conductivity, propagation constant
Delta	Δ	Δ	Incrment or decrement, determinant (cap), permittivity (cap), density, angles
Epsilon	Ε	Ε	Dielectric constant, permittivity, electric intensity
Zeta	Ζ	Ζ	Coordinates, coefficients
Eta	Η	Η	Intrinsic impedance, efficiency, surface charge density, hysteresis, coordinates
Theta	Θ	Θ	Angular phase displacement, angles, time constant, reluctance
Iota	Ι	Ι	Unit vector
Kappa	Κ	Κ	Susceptibility, coupling coefficient, thermal conductivity
Lambda	Λ	Λ	Permeance (cap), wavelength, attenuation constant
Mu	Μ	Μ	Permeability, amplification factor (in valves/ vacuum tubes), prefix for the micro multiplier.
Nu	Ν	Ν	Reluctivity, frequency
Xi	Ξ	Ξ	Coordinates
Omicron	Ο	Ο	
Pi	Π	Π	Universally used for 3.1416 . . . .
Rho	Ρ	Ρ	Resistivity, volume charge density, coordinates
Sigma	Σ	Σ	Summation (cap), surface charge density, complex propagation constant, electrical conductivity, leakage coefficient, deviation

Tau	Τ	Τ	Time constant, volume resistivity, time-phase displacement, transmission factor, density
Upsilon	Υ	Υ	
Phi	Φ	Φ	Scalar potential (cap), magnetic flux, angles
Chi	Χ	Χ	Electric susceptibility, angles
Psi	Ψ	Ψ	Dielectric flux, phase difference, coordinates, angles
Omega	Ω	Ω	Electrical resistance (cap), solid angle, angular velocity

Note: The small Greek letter in the alphabet is used except where the notation (cap) is used where the capital version of the Greek letter is used.

How was the Greek alphabet formed

As everyone knows the Greek alphabet with its characters and symbols dates back many thousands of years.

Although the Greek alphabet was widely used within the Greece and its empire, the alphabet and the associated symbols took on influences from much earlier civilisations as well as resulting from influences arising from the trade that took place within the Mediterranean and beyond..

One of the major influences for the Greek alphabet were the Phoenicians. Around 750 BC the Greeks started to adopt the language system from the Phoenicians although there were influences from the Minoans and Mycenaeans that were the other main groups with whom the ancient Greeks had contact.

Essentially the Greek alphabet became the successor to the Phoenician one, and ultimately became the Greek alphabet with its symbols that we use today.

Why are Greek letters used in mathematical & scientific equations

There are several reasons why there are many Greek letters that have been adopted into common use for constants in equations.

First, of course, it is necessary to realise that many of our standard letters are widely used, especially for variables: x, y, z are some common examples, but others are used as well.

Many letters from the Greek alphabet are used as constants within equations and formulas. Π, Θ, as well as α, β, θ and the like are widely used and seen representing the values or constants for a variety of values.

The roots of the usage of Greek letters comes from the earliest philosophers like Aristotle, and Diophantus and others. They used letters from the Greek alphabet as symbols to represent various variables. Although later civilisations used their own letters, the use of Greek letters tended to be used down the ages - people tended to use what was already established.

Today there are advantages to using Greek alphabet symbols. They are more distinctive than the normal alphabet in everyday use and they are less likely to be confused with the language text within mathematical work being written.

It is really a matter of convenience as well as the reduction of confusion that has lead to the continued use of Greek alphabet symbols being used to represent constants and sometimes variables in equations.

Oindrilla Das

Class: VIII F

How to Develop Logical Thinking and Ability

Humans were earlier thought to be either left-brain or right brain creatures, where each side of brain contributes to different aspects of thinking process.
The left-brain one were thought to be more logical, analytical and objective whilst the right-brain ones more intuitive, thoughtful and subjective.

But scientists now, have confirmed that such theories do not hold for people in general, but it might be true for some of the ways in which the brain functions.
The fact is that the person uses both parts of the brain equally and hence can see the whole picture as well as break it down and analyse the details.

However some of us may still find logical reasoning intimidating. We are intimidated not because we don't have the capacity to think like that but because we have not forced our brain to utilize that capacity to an extent that is required.

Here are some of the steps that one can take to build on to the skill.

THE CORE ACTIVITIES

Focus and attention:
When you face a problem, give it your full focus. Think only about the problem and forget everything else.

Suspect your memory:
While memory may be good for various tasks but when it comes to logic, memory is a bad master. Scrutinize your memory and don't trust it completely.

Avoid multitasking:
You cannot do two logical thinking activities at once.

Diagrams are your savior:
Always use paper and pencil, draw flowcharts, boxes, circles, to represent logic. Since you have not used your left-brain that much, you will use your right-brain to wake up your left-brain. After you have developed sufficient skills you will be able to do much of this stuff mentally.

Read good books:
Find books on logical reasoning, which promises to build the skills from ground up. Never try to master too much at once, take is slow and steady.

Take online tests:
Find some good online tests.

THE FUN ACTIVITIES

Solve puzzles:
Games like Sudoku, crosswords, and other online puzzles help a lot in building up logical skills.

Play chess:
If you don't know the game, learn it and try and play a little bit everyday. It will work wonders to your ability.

THE BASE ACTIVITIES

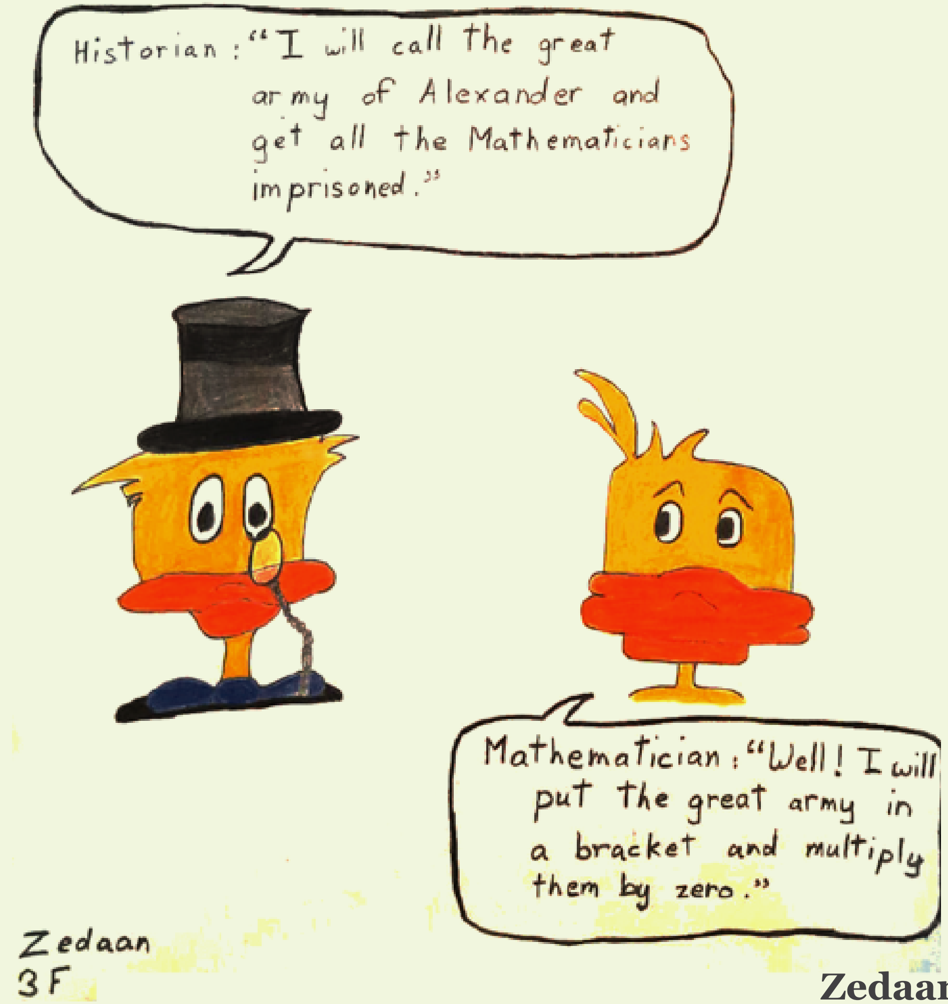
Eat a healthy diet:
Eating healthy food is a pre-requisite for smooth and robust functioning of the mind. Avoid junk food, sodas, colas, alcohol, caffeine, nicotine etc. Eating green vegetables, dry fruits like almonds, blueberries etc will boost the brain functions.

Sleep well:
Sleep for 7-8 hrs a day at a stretch and sleep on time and wake up on time regularly.

Practice Breathing and Meditation:
Breathing exercise and meditation will enhance your brain function manifold.

Exercise:
A healthy body has a healthy mind. There is no denying the fact.

D.K.Kirti
Maths Faculty



Zedaan
Class: 3 F

Indian Mathematicians and Their Inventions

Aryabhata:
Aryabhata was the first person to say that the Earth is spherical and revolves around the sun and stated the correct number of days in a year is 365 days. He also gave the formula $(a+b)^2=a^2+b^2+2ab$.Further, he worked on the place value system using letters to signify numbers and stating qualities.

Brahmagupta:
The introduction of zero to mathematics, which stood for "nothing", was the biggest contribution of Brahmagupta. He also explained how to find the cube and cube root of an integer and gave rules facilitating the computation of squares and square roots.

Srinivasa Ramanujan:
Srinivasa Ramanujan was one of the India's mathematical geniuses. He made substantial contributions to the Hardy-Ramanujan Littlewood circle method in number theory and worked on elliptic function, continued fractions, partial sums, products of hypergeometric series, and infinite series.

P.C. Mahalanobis:
Prasanta Chandra Mahalanobis's most significant contribution in the field of statistics was the Mahala Nobis Distance. Besides these, he had also made pioneering studies in the field of anthropometry and had founded the Indian Statistical Institute. He also contributed to the design of large-scale sample surveys in India.

C. R. Rao:
Calyampudi Radhakrishna Rao, popularly known as C R Rao is a well-known statistician, famous for his "theory of estimation". His contributions to statistical theory and applications are well known, and many of his results, which bear his name, are included in the curriculum of courses in statistics at bachelor's and master's levels all over the world.

D.R. Kaprekar:
Dattaraya Ramchandra Kaprekar was an Indian recreational mathematician who described several classes of natural numbers including the Kaprekar, Harshad and self-numbers and discovered the Kaprekar constant, named after him. Without any formal education in mathematics, he published extensively and was very well known in the recreational mathematics circle.

Harish Chandra:
Harish-Chandra FRS was an Indian American mathematician and physicist who did fundamental work in representation theory, especially harmonic analysis on semisimple LIE GROUPS.

Satyendra Nath Bose:
He is known for his collaboration with Albert Einstein, Satyendra Nath Bose established modern theoretical physics in India. Bose made significant advances in statiscal mechanics and quantum statistics, the description of all forces by single field theory, x-ray diffraction, and the interaction of electromagnetic waves with the ionosphere.

Bhaskara:
Bhaskara, an Indian astronomer, and mathematician helped to disseminate the mathematical work of Aryabhata. He was the one who declared that any number divided by zero is infinity and that the sum of any number and infinity is also infinity. He is also famous for his book "Siddhanta Siromani".

Narendra Karmarkar:
Karmarkar's algorithm is an algorithm introduced by Narendra Karmarkar in 1984 for solving linear programming problems. He is also listed as an ISI highly cited researcher.

Nirangkush Nath
Class: VI B

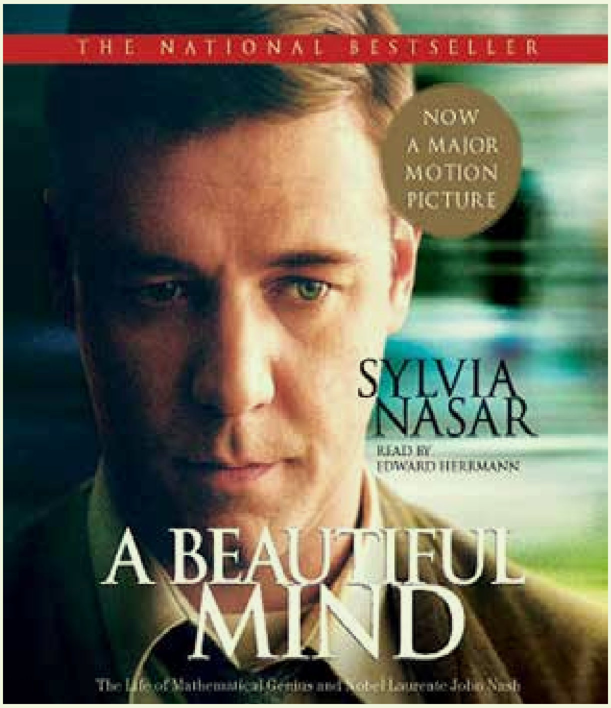
John Forbes Nash

John Forbes Nash Jr.(1928-2015) was an American mathematician who is known for his revolutionary "Nash Equilibrium" and Game Theory.

Nash was born on June 13, 1928, in Bluefield, West Virginia.His father was an electrical engineer for the Appalachian Electric Power Company.John Nash was very brilliant and intelligent from his very childhood.John's teachers at school certainly did not recognize his genius, and he himself didnot give them little reason to realize that he had extraordinary talents. They were more conscious of his lack of social skills and, because of this, labelled him as backward. By the time he was about twelve years old, he was showing great interest in carrying out scientific experiments in his room at home. In fact he learnt more at home than he did at school.Nash first showed an interest in mathematics when he was about 14 years old.

Nash attended Carnegie Institute of Technology (now Carnegie Mellon University) with a full scholarship (George Westinghouse Scholarship). He initially majored in Chemical Engineering but switched to Chemistry, and then eventually to Mathematics. After graduating in 1948 with Bachelor of Science and Master of Science degrees in Mathematics, he pursued his graduate studies in Mathematics at Princeton Universitywhere he worked in a broad range of fields of pure mathematics such as topology, algebraic geometry, game theory and logic.In 1950 Nash received his doctorate from Princeton with a thesis entitled "Non-cooperative Games". In the summer of that year he worked for the RAND Corporation where his work on game theory made him a leading expert on the Cold War conflict which dominated RAND's work. He worked there from time to time over the next few years as the Corporation tried to apply game theory to military and diplomatic strategy.

At Princeton University, he worked on his equilibrium theory.His work in mathematics includes the Nash embedding theorem, which shows that any abstract Riemannian manifold can be isometrically realized as a submanifold of Euclidean space. He also made significant contributions to the theory of nonlinear parabolic partial differential equations and to singularity theory.



During these times, he developed a mental disorder and suffered from maniacal characteristics, delirium and symptoms of schizophrenia. Despite spending periods in hospital because of his mental condition, his mathematical work continued to have success after success.In the 1990s Nash made a recovery from the schizophrenia from which he had suffered since 1959. His ability to produce mathematics of the highest quality did not totally leave him.

In 1978, Nash was awarded the John von Neumann Theory Prize for his discovery of non-cooperative equilibria, now called Nash Equilibria. He won the Leroy P. Steele Prize in 1999.

In 1994, he received the Nobel Memorial Prize in Economic Sciences (along with John Harsanyi and Reinhard Selten) as a result of his game theory work as a Princeton graduate student. In the late 1980s, Nash had begun to use email to gradually link with working mathematicians who realized that he was the John Nash and that his new work had value. They formed part of the nucleus of a group that contacted the Bank of Sweden's Nobel award committee and were able to vouch for Nash's mental health ability to receive the award in recognition of his early work.

Sylvia Nasar, a professor of journalism at Columbia University wrote a biography on John Nash called ‘A Beautiful Mind’ which was later also made into a feature film of the same name. The movie won numerous awards, including the Academy Award for Best Picture and Best Adapted Screenplay for 2001 at the 74th Academy Awards.

Krishna Pandit

Teacher, Maths Dept.

Jokes on Math

- Why was the student confused when he went from English class to math class? Because he was taught that a double negative in English is bad, but in math, it's a positive.

- What tool is best suited for math? Multi-pliers.

- Why was Mr. Gilson's class so noisy? He liked to practice gong division!

- Why did the girl wear glasses during math class? It improved di-vision.

- A father noticed his son was sad coming home from school one day. "What's wrong?" The father asked. "I really don't like long division," the son answered, "I always feel bad for the remainders."

- What's a swimmer's favorite kind of math? Dive-ision!

- Do you know what seems odd to me? Numbers that aren't divisible by two.

- Do you know what's odd? Every other number!

- Why was six afraid of seven? Because seven, eight, nine!

- A talking sheepdog rounds up all the sheep into the pen for his farmer. He comes back and says, "Okay, Chief - all 40 sheep accounted for". The farmer says, "But I've counted them and I've only got 36!" The sheepdog replies, "I know, but I rounded them up."

- I hired an odd man to do eight jobs for me. When I got back, he'd only done jobs one, three, five, and seven.

- What are ten things you can always count on? Your fingers.

Ayush Singha
Class: VIII J

Carl Friedrich Gauss

Born: April 30, 1777, Braunschweig, Germany

Died: February 23, 1855, Göttingen, Germany

Awards: Copley Medal

Education: University of Helmstedt, University of Göttingen, Braunschweig University of Technology Carl Friedrich Gauss was a German mathematician who contributed significantly to many fields, including number theory, algebra, statistics, analysis, differential geometry, geodesy, geophysics, mechanics, electrostatics, astronomy, and matrix theory, and optics.

Leonhard Euler

Born: April 15, 1707, Basel, Switzerland

Died: September 18, 1783, Saint Petersburg, Russia

Education: University of Basel (1720–1723)

Influenced: Carl Friedrich Gauss, Joseph-Louis Lagrange, and more

Spouse: Salome Abigail Gsell (m. 1776–1783), Katharina Gsell (m. 1734–1773)

Leonhard Euler was a Swiss mathematician, physicist, astronomer, logician and engineer who made important and influential discoveries in many branches of mathematics like infinitesimal calculus and graph theory while also making pioneering contributions to several branches such as topology and analytic number theory. He also introduced much of the modern mathematical terminology and notation, particularly for mathematical analysis, such as the notion of a mathematical function.

Isaac Newton

Born: January 4, 1643, Woolsthorpe-by-Colsterworth, United Kingdom

Died: March 31, 1727, Kensington, London, United Kingdom

Full name: Sir Isaac Newton

Education: Trinity College, Cambridge (1667–1668), The King's School, Grantham (1955-1959)

Sir Isaac Newton PRS was an English mathematician, astronomer, and physicist who is widely recognised as one of the most influential scientists of all time and a key figure in the scientific revolution.

Euclid

Born: Alexandria, Egypt

Nationality: Greek

Influenced: Stilpo, Thrasymachus of Corinth, Clinomachus, Eubulides, Ichthyas

Teacher: Archimedes

Field: Mathematics

Euclid of Megara was a Greek Socratic philosopher who founded the Megarian school of philosophy. He was a pupil of Socrates in the late 5th century BCE and was present at his death. He held the supreme good to be one, eternal and unchangeable and denied the existence of anything contrary to the good.

Srinivasa Ramanujan

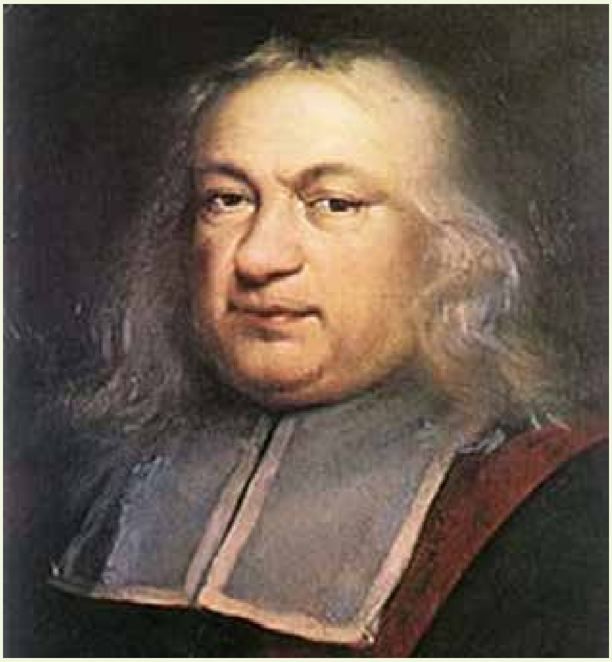
Born: December 22, 1887, Erode

Died: April 26, 1920, Kumbakonam

Spouse: Janakiammal (m. 1909–1920)
Education: Trinity College, Cambridge (1919–1920), University of Cambridge (1914-1919)

Parents: Komalatammal, K. Srinivasa Iyengar

Srinivasa Ramanujan was an Indian mathematician who made significant contributions to mathematical analysis, number theory and continued fractions. At age 31 Ramanujan was one of the youngest Fellows in the history of the Royal Society. He was elected "for his investigation in Elliptic functions and the Theory of Numbers." On 13 October 1918, he was the first Indian to be elected a Fellow of Trinity College, Cambridge. He is considered to be one of the best Indian mathematicians.



Pierre de Fermat

Born: August 17, 1601,
Beaumont-de-Lomagne, France

Died: January 12, 1665, Castres, France
Education: University of Orléans (1623–1626)

Spouse: Louise Long Fermat (m. ?–1665)

Books: Writings on Geometrical Loci

Parents: Dominique Fermat, Françoise Cazeneuve Fermat

Pierre de Fermat, A French mathematician who is often called the founder of the modern theory of numbers. Fermat developed a system of analytic geometry which both preceded and surpassed that of Descartes; he developed methods of differential and integral calculus which Newton acknowledged as an inspiration. He was also the first European to find the integration formula for the general polynomial, he used his calculus to find centres of gravity etc.

Gottfried Wilhelm Leibniz

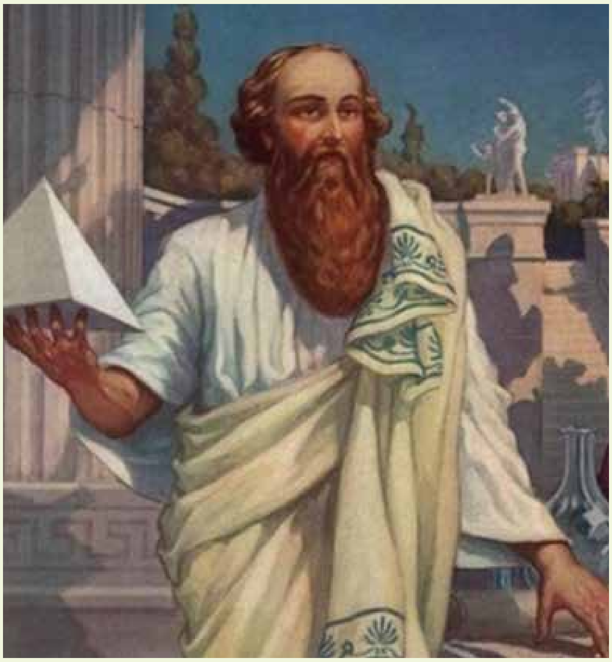
Born: July 1, 1646, Leipzig, Germany

Died: November 14, 1716, Hanover, Germany
Influenced: Ferdinand Georg Frobenius, more

Education: Leipzig University, University of Altdorf, University of Jena

Influenced by: René Descartes, Baruch Spinoza, Blaise Pascal and many more.

Leibniz pioneered the common discourse of mathematics, including its continuous, discrete, and symbolic aspects. His ideas on symbolic logic weren't pursued and it was left to Boole to reinvent this almost two centuries later.



Pythagoras

Areas of interest: Politics, Mathematics, Metaphysics, Ethics, Music

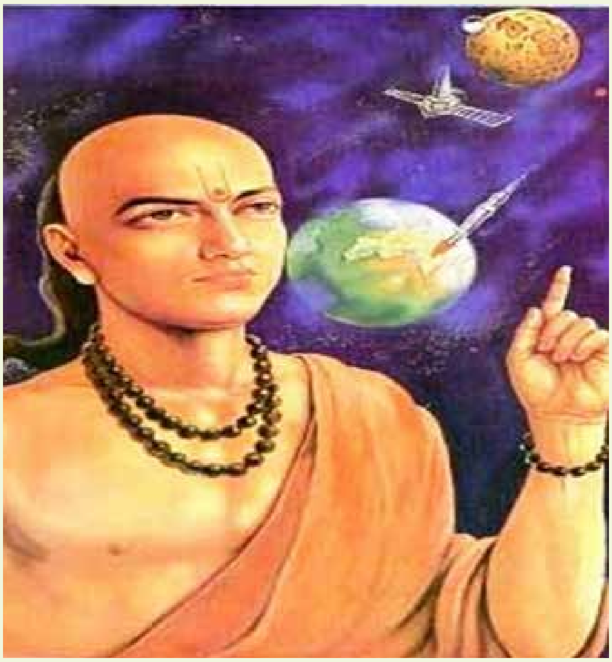
Influenced: Philolaus, Empedocles, Plato, Alcmaeon of Croton, Euclid, Johannes Kepler, Parmenides, Hippasus

Philosophical era: Ancient philosophy

Schools of thought: Pythagoreanism

Influenced by: Thales of Miletus, Anaximander, Pherecydes of Syros, Themistocles

Pythagoras discovered that harmonious intervals in music are based on simple rational numbers. This led to a fascination with integers and mystic numerology. The Pythagorean Theorem was known long before Pythagoras, but he is often credited with the first proof. Apastambha proved it in India at about the same time; some conjecture that Pythagoras journeyed to India and learned of the proof there.



Aryabhata

Born: 476 AD, Assaka
Died: 550 AD, India
Nationality: Indian
Books: Aryabhatiya
Main interests: Mathematics, Astronomy
Influenced: Lalla, Bhāskara I, Brahmagupta, Varāhamihira

Indian mathematicians excelled for thousands of years, and eventually even developed advanced techniques like the Taylor series before Europeans did, but they are denied credit because of Western ascendancy. Among the Hindu mathematicians, Aryabhata known as Arjehir by Arabs, maybe the most famous. Aryabhata is famous for the identity Σ (k3) = (Σ k)2. His most famous accomplishment in mathematics was the Aryabhata Algorithm for solving Diophantine equations. He made several important discoveries in astronomy.

René Descartes

Born: March 31, 1596, Descartes, Indre-et-Loire, France
Died: February 11, 1650, Stockholm, Sweden
Influenced: Noam Chomsky, Baruch Spinoza, Slavoj Žižek, more
Influenced by: Aristotle, Plato, Thomas Aquinas, Archimedes and many more.

René Descartes is considered the inventor of both analytic geometry and symbolic algebraic notation. His use of equations to partially solve the geometric problem of Pappus revolutionized mathematics.

Navya Bawri & Nikunj Bawri
Class: VI G

Mathematicians and their Inspiring Thoughts

1) What is mathematics? It is only a systematic effort of solving puzzles posed by nature.

— Shakuntala Devi

2) Why do children dread mathematics? Because of the wrong approach. Because it is looked at as a subject.

— Shakuntala Devi

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

—Aryabhata

4) The laws of nature are but the mathematical thoughts of God.

—Euclid

5) An equation means nothing to me unless it represents a thought of God.

—Srinivasa Ramanujan

6) Pure mathematics is, in its way, the poetry of logical ideas.

—Albert Einstein

7) Mathematics is not about numbers, equations, computations or algorithms: it is about understanding.

—William Paul Thurston

8) Nature is written in mathematical language.

—Galileo Galilei

9) The only way to learn mathematics is to do mathematics.

—Paul R.Halmos

10) You don't have to be a mathematician to have a feel for numbers.

—John Forbes Nash

11) The essence of math is not to make simple things complicated, but to make complicated things simple.

—Stan Gudder

12) Real G's move in silence when the mind is present at its best and ready to strike.

—Narender Karmakar

13) People think that mathematics is complicated.

— John Horton Conway

14) In mathematics the art of proposing a question must be held of higher value than solving it. The essence of mathematics lies in its freedom

—Georg Cantor

15) Mathematics is the queen of the sciences and number theory is the queen of mathematics.

— Carl Friedrich Gauss

Compiled by

Ved Basumatary

Class: VIII F

Mathematics in the 21st Century

Mathematics is an abstract science of numbers, quantity, and space, either as abstract concepts (pure mathematics), or as applied to other disciplines such as physics and engineering. Mathematics was introduced by the ancient Greek mathematicians. Many mathematicians at the same time contributed several topics from various parts of the world. So, nobody is called an inventor of mathematics. However, Archimedes is known as the father of mathematics. Aristotle, for instance, referred to Mathematics as “the science of quantity”. Also, German Mathematician Carl Friedrich Gauss defined Mathematics as “the Queen of the Sciences”. Mathematics is divided into two parts: Pure Mathematics and Applied Mathematics.One of the greatest achievements in the field of Mathematics in the early 21st Century was accomplished by Russian Mathematician Grigori “Grisha” Perelman, by solving “POINCARE CONJECTURE”, one of the Seven Millennium Problems. “POINCARE CONJECTURE” was proposed by French mathematician Henri Poincaré in 1904 and was one of the key problems in topology.During the Coronavirus pandemic, another great application of mathematics was seen when multiple researchers constructed the “Mathematical Modelling of Coronavirus Disease 2019 (COVID -19)”. Having mathematical modelling led researchers to understand the basic trend of infections and some common reasons to get infected.We can use mathematics in a multitude of fields to create models for specific issues and then solve them applying various theories, laws, formulae, and procedures.

Prastuti Barman
Class: VIII F

Mathematics Jokes

Greetings!

I am going to tell some maths jokes and entertain you all but you might not find them funny as my humour tends to zero.

1. A guy gets on a bus and starts threatening everybody: “I’ll integrate you! I’ll differentiate you!” So everybody gets scared and runs away. Only one person stays. The guy comes up to him and says: “Aren’t you scared, I’ll integrate you, I’ll differentiate you!” And the other guy says: “No, I am not scared, I am e^x.”

2. Why was the calculus teacher bad at baseball? He was better at fitting curves than hitting them.

3. Parallel lines have so much in common … It’s a shame they’ll never meet.

4. How do you solve any equation? Multiply both sides by zero.

5. I met a math teacher who had 12 children. She really knows how to multiply!

6. What do you call two friends who love math? Algebros

7. Why do atheists have trouble with exponents? They don’t believe in higher powers!

8. Why does algebra make you a better dancer? Because you can use the algo-rhythm!

9. Why is math considered to be codependent? It relies on others to solve its problems.

Tanish
Class: XII B

Mathematics of India

Mathematics, which is not only a subject we learn in our academics, but is also a part of our life. The word mathematics comes from the ancient greek word “mathema” which means “that which is learnt”. We now several things about mathematics in the modern period but there may be quiet less people who know about mathematics in the ancient or the medieval period.

INDIAN MATHEMATICS

Indian Mathematics emerged in the Indian subcontinent from 1200 BCE until the end of the 18th century. In the classical period of Indian mathematics (400 CE to 1200 CE), some very major contributions were made by Indian scholars such as Aryabhata, Brahmagupta, Bhaskara II, and Varahamihira. The decimal number system in use today was first recorded in Indian mathematics. To study the concept of zero as a number, negative numbers, arithmetic, and algebra, Indian mathematicians made early contribution. In addition, ‘Trigonometry’ was further developed in India, and, in particular, the modern definitions of sine and cosine were developed in India too. These mathematical concepts were transmitted to the Middle East, China, and Europe and led to further developments that now form the foundations of many areas of mathematics.

Ancient and medieval Indian mathematical works, all composed in Sanskrit, usually consisted of a section of sutras in which a set of rules or problems were stated with great economy in verse in order to aid memorization by a student. This was followed by a second section consisting of a prose commentary (sometimes multiple commentaries by different scholars) that explained the problem in more detail and provided justification for the solution. In the prose section, the form (and therefore its memorization) was not considered so important as the ideas involved. All mathematical works were orally transmitted until approximately 500 BCE; thereafter, they were transmitted both orally and in manuscript form. The oldest extant mathematical document produced on the Indian subcontinent is the birch bark Bakhshali Manuscipts, discovered in 1881 in the village of Bakhshali, near Peshawar(modern day Pakistan) and is likely from the 7th century CE.

A later landmark in Indian mathematics was the development of the series expansions for trigonometric functions (sine, cosine, and arc tangent) by mathematicians of the Kerala school in the 15th century CE. Their remarkable work, completed two centuries before the invention of calculus in Europe, provided what is now considered the first example of a power series (apart from geometric series). However, they did not formulate a systematic theory of differentiation and integration, nor is there any direct evidence of their results being transmitted outside Kerela.

SAMHITAS & BRAHMANAS

The religious texts of the Vedic Period provide evidence for the use of large numbers. By the time of the *Yajurvedasamhitā-* (1200–900 BCE), numbers as high as 1012 were being included in the texts. For example, the mantra (sacred recitation) at the end of the *annahoma* ("food-oblation rite") performed during the *aśvamedha,* and uttered just before, during, and just after sunrise, invokes powers of ten from a hundred to a trillion:

Hail to *śata* ("hundred," 102),
hail to *sahasra* ("thousand," 103),
hail to *ayuta* ("ten thousand," 104),
hail to *niyuta* ("hundred thousand," 105),
hail to *prayuta* ("million," 106),
hail to *arbuda* ("ten million," 107),
hail to *nyarbuda* ("hundred million," 108),
hail to *samudra* ("billion," 109, literally "ocean"),
hail to *madhya* ("ten billion," 1010, literally "middle"),
hail to *anta* ("hundred billion," 1011, lit., "end"),
hail to *parārdha* ("one trillion," 1012 lit., "beyond parts"),
hail to the *usas* (dawn),
hail to the *vyusti* (twilight),
hail to *udesyat* (the one which is going to rise),
hail to *udyat* (the one which is rising),
hail to *udita* (to the one which has just risen),
hail to *svarga* (the heaven),
hail to *martya* (the world),
hail to all.

CLASSICAL PERIOD

This period is often known as the golden age of Indian Mathematics. This period saw mathematicians such as Aryabhata, Varahamihira, Brahmagupta, Bhaskara I, Mahavira, Bhaskara II, Madhava of Sangamagrama and Nilakantha Somayaji give broader and clearer shape to many branches of mathematics. Their contributions would spread to Asia, the Middle East, and eventually to Europe. Unlike Vedic mathematics, their works included both astronomical and mathematical contributions. In fact, mathematics of that period was included in the 'astral science' (*jyotihśāstra*) and consisted of three sub-disciplines: mathematical sciences (*ganita or tantra*), horoscope astrology (*horā* or *jātaka*) and divination (samhitā). This tripartite division is seen in Varāhamihira's 6th century compilation—*Pancasiddhantika* (literally *panca*, "five," *siddhānta*, "conclusion of deliberation", dated 575 CE)—of five earlier works, Surya Siddhanta, Romaka Siddhanta, Paulisa Siddhanta, Vasishtha Siddhanta and Paitamaha Siddhanta, which were adaptations of still earlier works of Mesopotamian, Greek, Egyptian, Roman and Indian astronomy. As explained earlier, the main texts were composed in Sanskrit verse, and were followed by prose commentaries.

BAKHSHALI MANUSCRIPTS

The oldest extent mathematical manuscript in India is the Bakhshali Manuscript, a birch bark manuscript written in "Buddhist hybrid Sanskrit" in the *Śāradā* script, which was used in the northwestern region of the Indian subcontinent between the 8th and 12th centuries CE. The manuscript was discovered in 1881 by a farmer while digging in a stone enclosure in the village of Bakhshali, near Peshawar (then in British India and now in Pakistan). Of unknown authorship and now preserved in the Bodleian Library in the University of Oxford, the manuscript has been dated recently as 224 AD- 383 AD.

The surviving manuscript has seventy leaves, some of which are in fragments. Its mathematical content consists of rules and examples, written in verse, together with prose commentaries, which include solutions to the examples.The topics treated include arithmetic (fractions, square roots, profit and loss, simple interest, the rule of three, and *regula falsi*) and algebra (simultaneous linear equations and quadratic equations), and arithmetic progressions. In addition, there is a handful of geometric problems (including problems about volumes of irregular solids).

The Bakhshali manuscript also "employs a decimal place value system with a dot for zero."Many of its problems are of a category known as 'equalisation problems' that lead to systems of linear equations. One example from Fragment III-5-3v is the following:

Example: One merchant has seven asava horses, a second has nine haya horses, and a third has ten camels. They are equally well off in the value of their animals if each gives two animals, one to each of the others. Find the price of each animal and the total value for the animals possessed by each merchant.

The prose commentary accompanying the example solves the problem by converting it to three (under-determined) equations in four unknowns and assuming that the prices are all integers.

In 2017, three samples from the manuscript were shown by radiocarbon dating to come from three different centuries: from 224 to 383 AD, 680-779AD, and 885-993 AD. It is not known how fragments from different centuries came to be packaged together.

Punyabrat G. Choudhury
Class: VIII B

Mathematics of Rubik's Cube

"We turn the cube, and it twists us" by Ernõ Rubik.

Have you ever heard about a Rubik's cube? Many people have one. Some know how to solve one and some are struggling to solve it. The Rubik's Cube is a 3-D combination puzzle invented in 1974 by Ernõ Rubik, a Hungarian architecture professor. Rubik created the Cube as a learning exercise to teach his students about 3-dimensional spaces.Rubik's cube is listed as one of the 100 most influential inventions and is considered world's best-selling toy. Little did he know his "Magic Cube" (as he originally named it) would become one of world's most famous puzzles of all time!

A Rubik's Cube contains six centrecubies, eight corner cubies and twelve edge cubies. The goal is to move all the cubies into their correct positions. At first it was difficult for him to solve the cube as there were no manuals or solutions and it took several weeks for him to solve it. But now a days one canjust type "How to solve a Rubik's cube", and hundreds of videos will come up for how to solve it. There are a lot of ways to scramble and solve a Rubik's cube. To be precise there are 43,252,003,274,489,856,000 combinations. So, does one have to go through all the combinations to solve the Rubik's cube? Well, no, one can easily solve it by using algorithms. Algorithms are strategy-based instructions regarding moves which are represented by notations. They need to be followed in a step-by-step manner to solve the Rubik's Cube.There are numerous methods for solving the Rubik's cube like CFOP (Cross - F2L– OLL– PLL), ROUX and ZZ.A method is a series of algorithms for solving it. The original (3x3x3) Rubik's cube has 6 faces. There are 54 outer surfaces in total.There are variety of other puzzles like the Rubik's cube with their own methods on how to solve such as the 2x2 Rubik's cube, 4x4 Rubik's cube, 5x5 Rubik's cube, pyraminx, etc.

With the Rubik's cube, came the idea of speedcubing. Sometimes referred to as speedsolving, involves solving a variety of Rubik's cube puzzles as quickly as possible. Most speedcubers use the CFOP (Cross – F2L – OLL – PLL) method. As speedcubingstarted to become popular more and more cubersstarted competing for the fastest solve. One of the most well-known speedcubers in the world is Felix Zemdegs who has broken more records at world championships than any other speedcuber with a total of 121 world records. Yusheng Dufrom China is the current world record holder for the fastest solving of the Rubik's cube in the world. With an astounding 3.47 seconds, he beat former world champion FeliksZemdegs's record of 4.22 by 0.75 seconds. Algorithms of Rubik's cube can be solved by computer artificial intelligence as well.

Solving puzzles like Rubik's cube has many benefits. As itrequires practice to solve puzzles faster, it can help improve one'smuscle memory. At times puzzles can take minutes or even hours to solve so it also improves patience and focus.Rubik's cube is treated as an abstract tool to study specific scientific issues.
CFOP speed solving method: 'Cross, F2L, OLL, PLL (CFOP) is the most popular method for solving the Rubik's cube.

- Step 1- First we must solve the white edge pieces at the bottom.
- Step 2- When the cross is done, we solve the First 2 Layers (F2L) in one step using a technique to pair the white corner and second layer edge pieces.
- Step 3- Orienting the Last Layer (OLL) of the Rubik's Cube is the step in which we solve the yellow face without matching the side colours.
- Step 4- Permutation of the Last Layer (PLL)

Aradhya Das
Class: VIII B

Mathophobia

Mathematics, personified, is just like a horse. If you know how to control it and have a minimum mastery over it, you can experience a wonderful journey, albeit limited to your educational life or career. And if your phobia overpowers you and you are unable to control this untamed brute, then your educational journey only gets bumpier.

Mathematics has always managed to draw the maximum criticism from time immemorial due to its inherent foreboding nature from all classes of students. Mathematics, for all, is either black or white. You either like it or you hate it. There in no grey area in between where someone says "Mathematics is in my list of likeable subjects, though not my favourite." At least, I have not come across such diplomatic opinions regarding Mathematics in my years of learning and teaching the subject.

Most students suffer from this malady but this phobia is aggravated during exam time. So, when faced with this dire situation, instead of fleeing and giving up hopes, best alternative is to face it.

Research confirms that the pressure of examinations and tests and risks of public embarrassment are the main sources of unproductive tension among many students. There are numerous factors that trigger phobia for Maths in students, but the main reason is a constant pressure put on the students by parents, teachers, and their peers, forcing them to give importance to mathematics. The pressure and the constant statements regarding the importance and difficulty of mathematics negatively impact the students' subconscious minds. The continuous stress and dialogues passively transmit to the students that mathematics is challenging and cannot be solved quickly. The myth that math is difficult to understand becomes a fact in the child's subconscious and slowly the student begins to fear mathematics.

Some of the ways by which a students can overcome the phobia of mathematics are:

1. Positivity of Mind: Self degradatory and diminishing thoughts can play a major role in infusing a fear to face challenges. A student has to understand that every child is born with different capabilities and he/she should be proud of his/her other advantages and accomplishments.

2. Face it squarely: Face your fears, when you can't flee. Discuss your fears, with parents, teachers, sibling or even peers. Acknowledge the fact that not every student enjoys the same comfort level with maths as with other subject.

3. Find the cause: Try to identify the cause for your phobia. Is it a weak foundation or is it the formulae or the amalgamation of numbers and alphabets or the high expectations back home or an overbearing subject teacher back in the years gone by.

4. Encourage practice: The three P's of maths… practice-practice-practice. This is the basic mantra of overpowering this slimy subject.

5. Make maths fun and simple: When the complex word problem pose a big hurdle or the formulae a difficult to defeat enemy or the 'coses' and 'sines' of trigonometry an unknown jargon then try to make it simple. Take one step at a time.

6. Apply maths in daily life: Try to integrate maths in your daily life to make it more real and meaningful. Skip count while climbing stairs, handle money with changes while shopping, reinforce the concept of fraction while ordering your next Dominos pizza or birthday cake.

7. Encourage peer learning: When more minds are at work, the chances of a problem being solved is more then when only one is working. Peer learning is a more affective way of learning, specially in subjects like mathematics where a group of students can sit together and help each other to solve the problem.

Dear students, if you try to follow and inculcate the above mentioned methods to overcome 'mathophobia' you will definitely feel the difference, not only in your minds but also in you classroom performance and exams. And this, in turn, will make you 'an example for others to follow'.

Bornali Sharma
Maths Faculty

Maths is Hard

Maths is hard no matter
How hard I try
Maths is difficult no matter
How hard I cry

It's tough
But I won't lie
That I have to improve
As the days passes by

And yes my teachers are right
I have to practice more with all my sight.

Bhargavi Baruah
Class: V C

Zero

Zero zero, I am zero
Among all numbers, I am the hero!
Zero means none
But playing with me is really fun.
Add or subtract zero from any number
You will get the same number.
If you multiply me with any number
You will get again the zero number.
You cannot divide any number with me,
So be careful while playing with me!
I can amaze you with my trick you see!!!!!

0

URJA DEKA
Class: III B

Overcoming Math Phobia

In today's scenario and in this fast paced world, anxiety has become a prime concern among the adolescents and youth. The pressure to perform and excel in “all spheres of life” is insurmountable and difficult to fathom. However, sticking to the challenges we students try to play a balancing act and meet the expectations of our teachers and elders.

It is evident that worries might sound easy but handling them is the toughest. One of these is the so-called anxiety related to Mathematics which is a problem with more or less every person.

Mathematics, for many students, is perceived to be no less furious than a demon. Many students tend to get terrified as soon as they open the Mathematics textbook. This adds to their woes when their score in mathematics becomes significantly less. They give up saying that they can't do it. Unfortunately, math avoidance leads to less competency, leaving students more anxious and mathematically unprepared to face real life situations. This results in Math phobia.

Math Phobia may be a feeling of tension, apprehension, or fear that interferes with a students performance. An individual with math phobia doesn't necessarily lack ability in mathematics; rather they can't perform to their full potential due to the interfering symptoms of anxiety. It is caused not from personal experience but from parents, teachers and peers. Just to give an example, when parents with high math anxiety try to help their children with their homework, they unintentionally convey the idea that math is difficult and anxiety-provoking.

As it is well known that there is a triangle; teacher-student- parent- for the success of education, the role of each is important to eradicate math phobia from the minds of students. A very important factor for making maths lessons more fulfilling is to develop a love and passion for the subject and this essentially needs to be ignited by the teacher and once it is done the enthusiasm and learning zeal of the student will take him/her forward. The stimulus has to be created.

The true goals of mathematics should be to prepare students to face real-life problems with maths as a weapon. It should be taught to children that math is a creative subject and is part of our daily lives. Learning math is almost like learning music or art than it's to learning history or biology. Students should also make equal efforts from their side. They should practice as many questions they can and keep on giving tests as mentioned above to build confidence in themselves; this comes through self discipline.

To sum up, Maths phobia is merely a notion and we can overcome this gradually with our sustained interest in the subject and apply it in our everyday life.

Rajvi Purkayastha
Class: IX-D

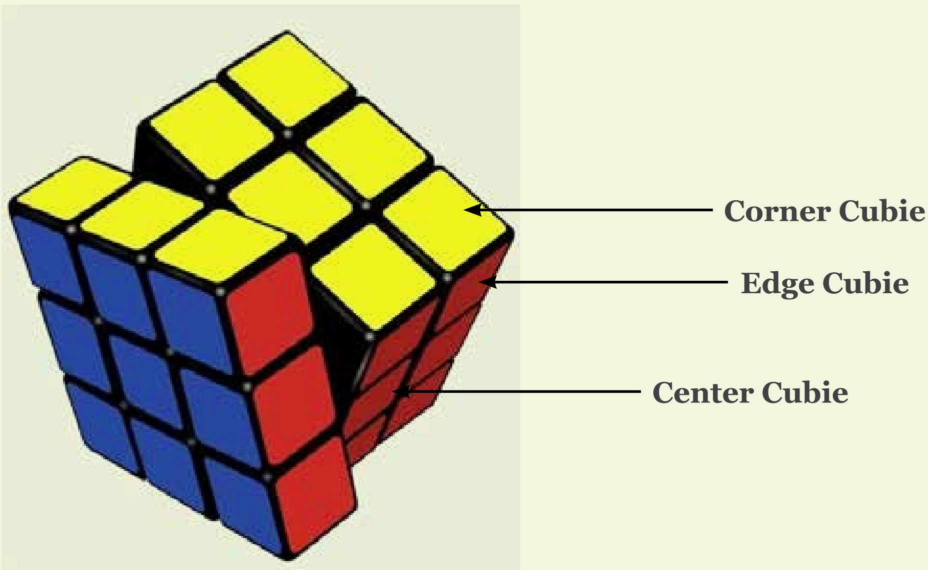
Ever since the Rubik's Cube was released, it's taunted almost a half billion tinkerers who thought they could crack its confounding mysteries, only to be stymied by its maddening secrets. The astounding realization that they made out of it was that the cube's literal insides may have been made out of mere plastic, but its real guts are nothing but numbers.

Starting with the basics – A regular Rubik's Cube has one core, 8 corner cubies and 12 edge cubies. The immediate math to be done with those numbers is the total number of times the cube can be scrambled, which is 43,252,003,274,489,856,000. Written in a more mathematical way, the number is $(3^8 x 8! \times 8!)(2^{12} \times 12!))/12$ Quite a lot, isn't it? Let's see how that comes together. The first term, 3^8, counts every way the eight-corner cubies can be rotated. A corner cubie can fit into its slot rotated three different ways. That's a factor of 3 for each of the eight corner cubies, so they multiply to 3^8.

Next is where each corner cubie goes. There are eight corner slots, so the first corner cubie has eight options. The second corner cubie is left with seven options, the next left with six, and so on, down to the last corner cubie, which must go in the last corner slot. That yields the calculation8×7×6×5×4×3×2×1, which is 8!, or "eight factorial."

Thus the first chunk, (38×8!), counts every way the corner cubies can fit into the cube. The 38 is their orientations, while the 8! is their locations.

The next chunk, (212×12!), is the same idea, now for the edges. Edges only have two orientations, so the 12 of them have a total of 212 mixes of orientations. Then there are 12



locations, so 12! is the number of ways they can go to those spots.

With time, questions about the new toy emerged. The most interesting one of them was- No matter how scrambled a cube gets, how few moves can be applied to solve it? Thanks to early quips about divine intervention being necessary to glean it with confidence, that number became known as "God's number."
The first major insight on God's Number was by Dr. Morwen Thistlethwaite in 1981, who proved it was at most 52. That means he proved every scrambled cube can be solved in 52 moves or less.

Progress continued through the 1990s and 2000s. Finally, in June 2010, a team of four scientists proved thatGod's number is 20. So no matter how scrambled a Rubik's Cube looks, it's always 20 moves away from solved.

And that's roughly all the math that's need to be known about the cube. Truly, the invention of the Rubik's Cube was that of a mathematical wonder.

Credit goes to "cube prodigies", whose certainly visible talent resulted in making of algorithms and the concept of "muscle memory", speedcubing is now an international sport, with tournaments held yearly by the World Cube Association (WCA).

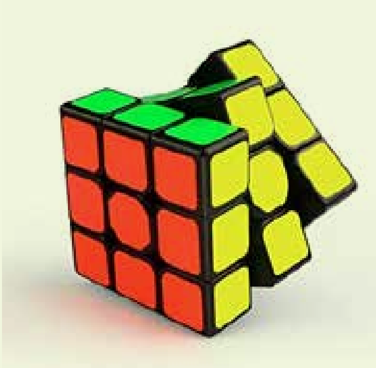
The most recent 3x3 Rubik's cube world record was 3.47 seconds, by Yusheng Du, 1.86 seconds by Tymon Kolasinski for the pyraminx, 1.02 seconds for the 2x2 Rubik's cube, and so on.

However, there's a common myth that in order to be able to solve the cube, one needs to be good at math. Although, there's a lot of math involved in the making of the cube, solving of it has no relation to it.

And that, fellow students, was all about the **Rubik's Wonders.**

~Nafisa Bilquees Hussain

Class: VII C



Some Tips and Tricks of Mathematics

#1. Squaring of a number ending with 5

In this trick, you would learn how quickly squaring a two-digit number ending in 5.

Multiply the first digit on the left with its successor and put 25 on the end. That is all!

For example: Find $(45)^2$ =?

Step 1. 45 x 45 = ...25 (in the end)
Step 2. 4x (4+1) = 4 x 5 = 20

Hence the answer will be **2025**.

#2. Multiplying any number by 5

Most students memorize the 5 times tables very easily, but when you get into larger numbers it gets more complex – isn't it? But don't worry! This trick is super easy.

Take any number, then divide it by 2 (in other words, half the number). If the result is whole, add a 0 at the end. If it is not, ignore the remainder and add a 5 at the end. It works every time:

For example: 2462 x 5 =?
Step 1. 2462 / 2 = 1231
Step 2. Whole number, so add 0
The answer will be 2462 x 5 = **12310**

Let's try another: 3773 x 5

Step 1 3773 / 2 = 1886.5
Step 2. Fractional number, so ignore remainder and add 5
The answer will be 3773 x 5 = **18865**

#3. Subtraction from 1000, 10000, 100000 and so on.

This subtraction trick is very useful for getting instant subtraction result of any large number from 1000, 1000... so on. You just keep one formula-Subtract all from 9 and the last from 10.

For example: 1000-473 =? (Subtraction from 1000)

We simply subtract each figure in 473 from 9 and the last figure from 10.

Step 1. 9 – 4 = 5
Step 2. 9 – 7 = 2
Step 3. 10 – 3 = 7

So, the answer is 1000 – 473 = 527

#4. Multiplication of any 2-digit numbers, from 11 to 19

By using this trick, you can multiply any two-digit number from 11 to 19 quickly. No wonder if generously practiced, it can give result faster than calculator! Have a look on the 4 steps involved in it:

Step 1. Add the unit digit of smaller no. to the larger numeral.
Step 2. Multiply the result by 10.
Step 3. Multiply the unit digits of both numbers.
Step 4. Add both the numbers (involve in step 1 & step 2).

For example: Take 2 numbers like 13 and 16.

Step 1. 16 + 3 =19.
Step 2. 19*10 = 190.
Step 3. 3*6 = 18
Step 4. Add the two numbers, 190+18 and the answer is 208.

#5. Dividing a large number by 5

This trick will get you result quickly of dividing a large digit number by 5. All you need to follow only two steps, in first step multiply the number by 2 while in second step move the decimal point.

For example: 235 / 5 =**?**

Step 1. 235*2 = 470
Step 2. Move the decimal: 47.0 or just 47

Let's try another: 2128 / 5

Step 1: 2128 * 2 = 4256
Step 2: Move the decimal: 425.6 or just 425

#6. Multiplication of a two-digit number by 11

With this trick, multiplication can be done in 1 or 2 seconds. So, let us see how using this method, calculation can be done in a matter of seconds.

To multiply 25 and 11, imagine there is a space between 25

Step 1. Put an imaginary space in between: 25*11= 2_5
Step 2. Just add 2 and 5 and put the result in the imaginary space

So, the answer is: 25 * 11 =**275**

Let's try another:
42 * 11 = 4 (4+2) 2 = **462**

#7. Multiply any large number by 12

To multiply any number by 12 just double last digit and thereafter double each digit and add it to its neighbour.
For example 13243 * 12 = ?

Let's break it into simple steps:

Step 1. 13243 * 12 = ______ 6 (Double of Last Digit 3= 6)
Step 2. 13243 * 12 = ______ 16 (Now Double 4=8, and add it to 3, 8+3=11, 1 will get carry over)
Step 3. 13243 * 12= ______ 916 (Now Double 2=4, and add it to 4 with carry, 4+4+1=9)
Step 4. 13243* 12= ______ 8916 (Now Double 3=6, and add it to 2, 6+2=8)
Step 5. 13243 * 12= ______ 58916 (Now Double 1=2, and add it to 3, 1+3=5)
Step 6. 13243 * 12= ______ 158916 (Now Double 0=0, and add it to 1, 0+1=1)

So your final answer of 13243 * 12 = 158916

#8. Multiplication of any 3-digit numbers

Take any two numbers like 308 and 306

Step 1. Now subtract the number at unit place.
308-8=300
306-6=300
Step 2. Now select any number and add the unit digit of another number
308+6=314
Step 3. Now multiply, 314×300 = 94200
Step 4. Now multiply the unit digits of both numbers, 8×6=48
Step 5. Add, 94200+48 = 94248

The product of the numbers 308 and 306 is **94248**

#9. Convert kilograms to pounds quickly

If you want to convert kilograms to pounds, you can do it in your head in few seconds.
Let take an example: Convert 112 Kg to pound.

Step 1. Multiply Kg value by 2
112X2= 224
Step 2. Divide the previous one by 10
224/10=22.4
Step 3. Add both the number
224+ 22.4= **246.4 pounds.**

#10. Trick for finding any square:

Finding square of any number using this trick is extremely easy. Just follow the given steps:

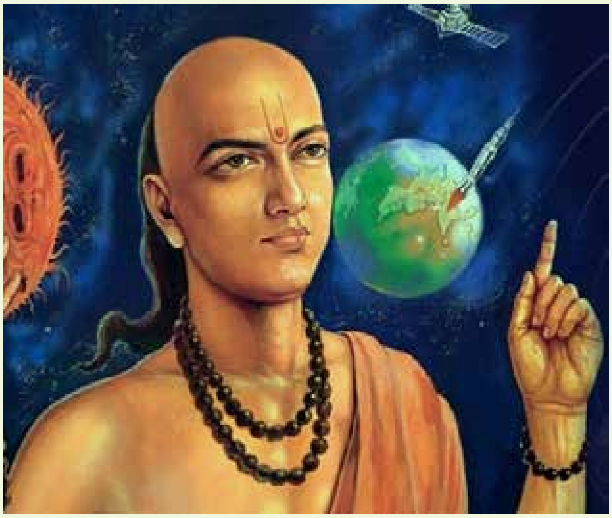
Step 1. Choose a base closer to the number whose square is to be found.
Step 2. Find the difference of the number from its base.
Step 3. Add the difference with the number.
Step 4. Multiply the result with the base.
Step 5. Add the product of the square of the difference with the result of the above point.

Let's take an example to understand this: $(99)^2$ =?

Step 1. Choose 100 as base
Step 2. Difference =99-100 = -1
Step 3. Number + difference = 99 + (-1) = 98
Step 4. Multiplying result with base
= 98*100 = 9800
Step 5. Adding result with square of difference=
9800 + $(-1)^2$ = **9801**

Leena Choudhury
Maths Faculty

The Great Indian Mathematicians



India is a country that has uncountable mathematicians from ancient times, among them Aryabhatta and Srinivasa Ramanujan are the most popular. Aryabhatta was born on 476 AD in Kerala. Aryabhatta studied initially at Kerala and later went for higher studies to Patliputra, now it is Patna. He studied at Nalanda University. Besides mathematician, Aryabhatta was also an astronomer. His invention of the symbol of 'zero' leaves a remarkable impression of him throughout the whole world. His notable ideas includes the lunar eclipse and solar eclipse. He also explained the reflection of light by moon and Earth's rotation on its axis. The most notable idea of Aryabhatta is his description on four decimal places of π (pi) value. He also explained how to calculate the length of sidereal year and diameter of the Earth.

Another Indian Mathematician is Srinivasa Ramanujan who was born on 22nd December 1887 at Erode, Tamil Nadu. He studied at Trinity College, University of Cambridge. Ramanujan was the great mathematician of modern India. His discovery on Number Theory and Infinite Series was very famous. Ramanujan stated that if we add all the natural number all the way to infinity we will find that it is equal to - 1/12. This formula is called Ramanujan's Summation. His one of the greatest finding was Infinite Series for π (pi). He is known as the man who knew infinity.

The contribution of Ramanujan and Aryabhatta in the field of mathematics is endless, which I think cannot be in any article or write up. We the Indians should be always grateful and proud for the contribution of these two great mathematicians.

Baidurjya Bhadra
Class: V B

Structures are the weapons of the mathematician

Nicolas Bourbaki - The Greatest Mathematician That Never Lived

Despite of being one of the most influential mathematicians of his time, when Nicolas Bourbaki applied to the American Mathematical Society, he got rejected because he did not exist. After the first World War the field of mathematics had become fragmented as many established mathematicians had lost their lives and there was a lot of friction among the different groups mainly due to the lack of a shared mathematical language. It was difficult to share or expand their work together. In 1934, a group of French mathematicians studying at the prestigious École Normale Supérieure or ENS found the textbook for their calculus class so disjointed that they decided to write a better one. They got new members, the project and their ambition grew and they created the "Éleménts de mathématique", a treatise that sought to create a consistent logical framework unifying every branch of mathematics.

The text began with a set of simple axioms – laws and assumptions it would use to build its argument. From there, its authors derived more and more complex theorems that corresponded with work being done across the field. To truly reveal common ground, the group needed to identify consistent rules that applied to a wide range of problems. They gave new clear definitions to some of the most important mathematical objects including the function. The group began to define functions by how they mapped elements across domains. They defined the functions as injective, surjective and bijective which allowed establishment of logic that could be applied across the function's domains in both directions.

Their systematic approach to abstract principles was in stark contrast to the popular belief that math was an intuitive science, and an over-dependence on logic constrained creativity. But this rebellious band of scholars gleefully ignored conventional wisdom. They were revolutionizing the field, and they wanted to mark the occasion with their biggest stunt yet. They decided to publish "Éleménts de mathématique" and all their subsequent work under a collective pseudonym: Nicolas Bourbaki. Over the next two decades, Bourbaki's publications became standard references and the group's members took their prank as seriously as they took their work. Their invented mathematician claimed to be a reclusive Russian genius who would only meet with his selected collaborators. They sent telegrams in Bourbaki's name, announced his daughter's wedding, and publicly insulted anyone who doubted his existence. In 1968, when they could no longer maintain the ruse, the group ended their joke by printing Bourbaki's obituary, complete with mathematical puns. Despite his apparent death, the group bearing Bourbaki's name lives on today. Though he's not associated with any single major discovery, Bourbaki's influence informs much current research and the modern emphasis on formal proofs owes a great deal to his rigorous methods.
Nicolas Bourbaki may have been imaginary – but his legacy is very real.

Raushan Singh
Class: XII B

The Mystic Philosopher-Mathematician

On digging deep into an Italian cult that worshipped the number 10, triangles and fava beans, you would find the Greek philosopher Pythagoras preaching to the "Pythagoreans" or the members of his cult. If you were wondering if this was the same eccentric intellectual who invented the Pythagoras Theorem, you would be surprised to know that your guess was absolutely correct!The same Pythagoras Theorem that you would use to find the hypotenuse of the triangles was created by this unconventional cultist who proclaimed to be the son of God.

Pythagoras was also believed to be able to see music, hear colours, associate scents with people's names. Though this might seem to be made up, historians believe that he had a condition called Synaesthesia which allowed him to perceive the world differently. When you delve deeper into his cult, you would find that the cultists were ascetics who adopted vegetarianism but would still sacrifice oxen during special events. They believed in transmigration of souls and were obsessed with numbers.The last but not the least, they believed that fava beans housed souls of the dead and thatthey were never to be eaten and only worshipped!

Born in the Isle of Samos in 570 BC under the reign of the tyrant Polycrates,Pythagoras abandoned his homeland and voyaged to Southern Italy wherein he established his School. But what education did Pythagoras receive to become eligible to teach the masses? He was a student of the famous mathematician, Thales, also regarded as one of the seven sages of Greece and by far much more qualified than the average mathematician back in the day. Once he reached Southern Italy, he did not just stop there but advanced into Babylon and Egypt.But that is a tale for another day.

In Southern Italy he started a school which attracted a lot of attention from the locals who began to worship him and thisled him to forma pseudo-religion that laterbecame a major cult. Inancient Greeceit was not uncommon to attribute great importance, even divine importance, to profound philosophical formulations. But the Pythagoreans took it to another level, for example, when they discovered the 47th Proposition of Euclid which was believed to be a Pythagorean problemand merely recorded in Euclid's writings on geometry, they started sacrificing oxen to celebrate what they considered to be anauspicious event. Even more absurd is the fact that they refused to eat fava beans because they believed that the souls of the dead transmigrated to these beans making them unfit for human consumption.At the same time, they believed in the reincarnation of the human soul which does seem quite contradictory. He believed that the only way to break away from this cycle of reincarnation was to obtain a higher understanding of the world through philosophical study.

Many considered Pythagoras to be the first pure mathematician. At the core of his teachings is the belief that reality is essentially mathematical in nature and that there was a system of principles behind numbers. He found harmony in numbers and attached symbolism to them. This created an aura of mystery around his thoughts and influenced many early philosophers. Though the Pythagoreans had many rational thoughts, they had some groundless beliefs too. They believed that some numbers had a higher importance than others and thatsome had mystical properties. They worshipped the numbers 1 and 10 assigning them a position of high importance and linked the numbers 7 and 8 to wisdom and justice respectively. While some may find their ideas to be just a little too eccentric, others may consider them to be downright ridiculous.

No one can deny that Pythagoras's contributions to the mathematical society made a great impact but his supreme reign over the cult had to eventually come to an end. After Croton waged awar against the neighbouring colony of Sybaris and won the battle, the Pythagoreans seemed to disagree with the democratic constitution brought in and this angered the supporters of democracy. Now whatever happened after this point of time is shrouded in mysteries, so the occurrences following this may not be completely veracious.But it is widely accepted that Pythagoras was killed during a meeting with the democratic supporters and that the building where he was present was set to fire. Another completely different section believed that somehow Pythagoras died while defending a field of fava beans which he treasured so much that he refused to run over them asthis would completely violate his teachings.

Even today Pythagoras Theorem is used in various fields such as Architecture, Aerial Navigation, Surveying and it is also a concept strongly used inTrigonometry. The Formula goes as A2+ B2 = C2 where C represents the Hypotenuse and A&B are the other two sides of the right triangle. Though one can never be certain of the cause, the circumstances and the time of his death, Pythagoras has departed from the canvas of life a long time ago. But his teachings live on and I am referring not only to the Pythagoras Theorem but to the fact that he was worshipped as a legend and a God for many successive generations.

Aditya Singh
Class: XII B

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Mathematics the use of Symbols

HISTORY OF MATHS SYMBOL:
Mathematicians originally wrote mathematical operations being carried out by them in sentences. So to save time and convenience of their research work mathematical symbols were introduced. Instead of writing as 'add 3 to number 6', they use the symbol '+' and wrote 3+6=9, likewise other symbols were also introduced as per the required condition. The symbols like **+, , x and ÷** are used with some purpose of the mathematicians. Let's take a look at how symbols for the four basic mathematical operations namely **Addition, Subtraction, Multiplication** and **Division** came into existence.

EQUAL TO:
Robert Recorde, a well known physician and mathematician invented the **"EQUAL TO symbol (=)"**. He introduced the **'='** symbol in his book **"The Whetstone Of Witte"** in **1557.** To avoid the tiring repetition of the word 'is equal to' over and over again, he used two parallel horizontal lines of equal length.

PLUS AND MINUS SYMBOLS:
The term 'plus and minus' come from Latin language. In Latin plus means **More** and minus means **Less.** The origin of + and - can be traced from **14th** and **15th** century. The + symbol is derived from the Latin word **"ET"** meaning **"AND". Nicole Oresme,** a French Philosopher used the symbol + as a short hand version of ET in his book work **"The Algorismus Proportionum"**. The origins of the minus symbol are unclear. The "+" and "—" sign gained more popularity after **Johannes Widman** used the two in his work, **"Mercantile Arithmatic"**.

MULTIPLICATION:
The symbol of multiplication is actually called the **"CROSS OF SAN ANDREAS"**. The symbol saw its first use in Maths in the **16th century.** We credit **William Oughtred**, an English mathematician for first using the cross of San Andreas to represent the multiplication of two numbers.

DIVISION:
Division sign was named originally as **"OBELLUS"** which means small **"DAGGER"** because the sign **(/)** is like obellus. Obellus was first used by **Swiss** mathematician **Johann Rahh** in his algebra book titled **"Teutsche Algebra".** The fraction bar **(/)** for division was introduced by **De Morgan in 1845.** In an attempt to maintain division in the same line, **Gottfried Leibniz** introduced the **colon (:)** to represent division and ratios.

CONCLUSION:
Thus, to avoid repeating themselves and save precious time, mathematicians developed universally recognizable symbols. Most maths symbols originally invented during the **14th** and **15th centuries** are now globally used **"NOTATIONS".**

Utkarsh Medhi
Class: VII E

Why I Like Mathematics

1) **IT DOESN'T CHANGE**

The numeric answer of a question will always be the same. No matter in what language you solve it, or what method you use, there will always be one answer.

2) **MATH BUILDS PROBLEM SOLVING SKILLS**

By learning how to look at a problem, math helps us to be able to develop our own plans and solutions for both a math problem and a life problem.

3) **MATH IS USEFUL IN DAILY LIFE**

It has the ability to help in our day-to-day life. For example:-
You go out with your mother to the grocers. She tells you to buy at least 5 vegetables and gives you a specific amount to pay for them. All the vegetables available there have fixed rates for a kilogram of it. By using math, you'll be able to find a solution for how many kilograms of a vegetable you should purchase in order to save some money for the next purchase.

4) **MATH IS BLACK AND WHITE**

Mathematics is not subjective. Every question has clear answer and when solved, the answer given would be either right or wrong. There is no room for vagueness. The certainty that it brings is often enjoyable.

5) **MATH IS FUN**

Math is portrayed as a dull subject. In some aspects, yes, because there is a possibility that while learning a specific topic, the learner might feel apathy. But that doesn't mean that math doesn't have its own thrills, and it certainly brings satisfaction to the doer when they are able to solve any question.

Reeda Zulfiaz
Class: VII D

Women in Mathematics

From the ancient revelations of the shape of space to the furthest explorations achievable by imagination and logic, the history of mathematics has always been seen as a masculine endeavour.When we use the term mathematician, names like Euler, Gauss, Newton, Reimann, Ramanujan, Aryabhatta, Bhaskara flashes by and why not, these are the people who have discovered the most amazing discoveries in their lifetimes.

Although in the modern age of humanity, with exposure to various information and born with the right of education and curiosity of mankind, the margin is very thin between male and female association with Mathematics.

The world of mathematics has received significant contribution from women from a very long time. Let's look into some of the greatest women mathematicians of all time-

1. Our list starts off with **Hypatia**, the daughter of prominent Egyptian Mathematician Theon with whom she collaborated on several famous mathematical works. She is considered the first known female math teacher in history and was also known for teaching astronomy and how to use an astrolabedevice to model astronomical events.

2. **Katherine Johnson** joined NASA in 1953 and her contributions in orbital mechanics were crucial to the success of the USA's aeronautics and space programmes. In 2015, she was presented with the Presidential Medal of Freedom by Barack Obama for her important work as a mathematician, physicist and space scientist as a woman of colour. She was responsible for calculating the trajectory for Project Mercury and the Apollo 11 flight to the moon, which means she helped the first spaceship and the first Americans reach the moon!

3. **Mary Cartwright** was a British mathematician and a woman of many firsts! She was not only the first woman to obtain a first in her university degree, but also one of the first mathematicians to study what is now known as chaos theory. She was the first woman to receive the Sylvester Medal (awarded for the encouragement of mathematical research), the first woman to be President of the Mathematical Association and the first woman to be President of the London Mathematical Society.

4. Russian mathematician **Sofia Kovalevskaya** made monumental contributions to analysis, partial differential equations and mechanics. She was a pioneer and icon for females in mathematics and STEM subjects everywhere.The first woman to obtain a doctorate in mathematics, she went on to gain global recognition in the mathematical community due to her paper on partial differential equations and was awarded the Prix Bordin from the French Academy of Sciences.

5. **Maryam Mirzakhani** was born in Tehran, Iran. She received the 2014 Fields Medal (often referred to as the "Nobel Prize for Mathematics"). Mirzakhani is the first and, to-date, only female recipient of this prestigious award since its inception in 1936. At the time of her death, she was Professor of Mathematics at Stanford University.

6. **Ada Lovelace** was an English Mathematician who is regarded as the world's first computer programmer. In 1836, she wrote the world's first computer program known as an algorithm for an Analytical Engine to compute Bernoulli numbers. In 1852, Lovelace died due to an illness at only 37 years old. However, despite her short life, she made significant contributions to the fields of mathematics and computer science that can still be seen to this day. She is still regarded as the first person to understand the potential of a computing machine.

These women have paved ways to inspire more women as well as men in the world of Mathematics. Unfortunately, there is a stereotype that still prevails today that maths is a male subject and that girls are no good at it. But by following the footprints of these ladies as inspiration one can be motivated to pursue their own aims in the field of Mathematics.

Rumi Sharma
Teacher
Maths Faculty

Who am I ????

Hi! I hope you all know me very well but I would like to introduce myself with a riddle and you need to guess my name-

"Between two 'mats' lies 'he' with a tail as 'ics' in the end"

Well let me introduce myself..... I am Mathematics son of Archimedes. My name literally means "Subject of Instruction" in Greek language. Pythagoras uncle named me by this name. My nick name is Maths or you can call me Math as well. For students who hate me, I am not Mathematic for them I am **'Mathe mai tik'** (Mathe-Brain mai-inside tik-stay, stay in my brain) for them. I was the love of every student till 5th grade but when they saw my son Algebra they started hating me, well I don't know why but I love kids. Let me introduce my kids to you.... Number System, Algebra, Geometry, Calculus and Topology. Did you know that I am the queen of science, number theory is my queen and Carl Friedrich Gauss is my prince. My birthday is on 14th October, but I wasn't actually born on that day. Infact, I myself can't recall my actual birthday. I was born before several years ago so forgetting my birthday is justified.

Afia Zeenat
Class: X A

Top Awards in Mathematics

THE FIELDS MEDAL:

This is one of the most prestigious awards awarded to mathematicians who have accomplished a lot in their careers. This award, officially known as the International Medal for Outstanding Discoveries in Mathematics, is presented to up to four mathematicians under the age of 40 once every four years. The award is presented at the International Congress of the International Mathematical Union, which occurs only every four years, and is the highest esteemed honour in the mathematics community.

ABEL PRIZE:

A mathematician who excels in their field of study is given this distinguished award by the king of Norway.When it was first created in 2001, it was named after popular Norwegian mathematician Niels Henrik Abel.Some even refer to it as the mathematics equivalent of the Nobel Prize.

WOLF PRIZE IN MATHEMATICS:

The Wolf Prize in Mathematics is one of six awards given out annually by the Wolf Foundation of Israel. This prize has been awarded since 1978, and it also a very prestigious honour to receive one in the fields in which they are given. A couple of latest winners of the WOLF PRIZE in Mathematics include Peter Sarnak, LuisCaffarelli, Michael Aschbacher, George Mostow and Michael Artin.

THE CHERN MEDAL:

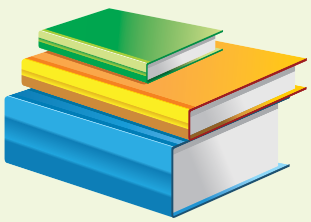
On the occasion of the International Congress of Mathematicians, the Chern Medal is given every four years to a person whose contributions to mathematics merit the greatest level of honour. The Medal shall be open to all living, natural persons, regardless of age or profession. Together, IMU and the Chern Medal Foundation (CMF) present the Chern Medal. The Chern Medal is supported by CMF. The Medalist will receive a cash award of 250,000 USD. Louis Nirenberg, the initial award in 2010, and Barry Mazur, the subsequent recipient in 2022.

LOUISE HAY AWARDS:

The Association for Women in Mathematics established the Louise Hay Award in 1990 to honour accomplishments made women math educators. The prize was established in Louise Hay's honour. Vilma Mesa to receive the 2022 Louise Hay Award for Contributions to Mathematics Education Award

Gaurika Dutta

Class: VI B



Root Rationalization

Definition: When the denominator of an expression contains an irrational term then the process of converting its denominator into a rational number is called rationalization.

Procedure: The irrational number is converted to rational number by the process of multiplication.

Example 1:

$$\frac{(9)}{\sqrt{3}} = \frac{(9)}{\sqrt{3}} \times \frac{(\sqrt{3})}{\sqrt{3}} = \frac{9\sqrt{3}}{3}$$

$\sqrt{3}$ is the rationalization factor for $\sqrt{3}$. As a result, in the product of two, the square root disappears from the denominator.

Example 2:

$$\frac{(3+\sqrt{5})}{\sqrt{2}} = \frac{(3+\sqrt{5})}{\sqrt{2}} \times \frac{(\sqrt{2})}{\sqrt{2}} = \frac{(3\sqrt{2}+\sqrt{10})}{2}$$

Question

Find the value of $\left\{\frac{1}{(\sqrt{6}-\sqrt{5})} - \frac{1}{(\sqrt{5}-\sqrt{4})} + \frac{1}{(\sqrt{4}-\sqrt{3})}\right\}$.

Solution:

$$\left\{\frac{1}{(\sqrt{6}-\sqrt{5})} - \frac{1}{(\sqrt{5}-\sqrt{4})} + \frac{1}{(\sqrt{4}-\sqrt{3})}\right\}$$

$$=\left[\left\{\frac{1}{(\sqrt{6}-\sqrt{5})} \times \frac{(\sqrt{6}+\sqrt{5})}{(\sqrt{6}+\sqrt{5})}\right\} - \left\{\frac{1}{(\sqrt{5}-\sqrt{4})} \times \frac{(\sqrt{5}+\sqrt{4})}{(\sqrt{5}+\sqrt{4})}\right\} + \left\{\frac{1}{(\sqrt{4}-\sqrt{3})} \times \frac{(\sqrt{4}+\sqrt{3})}{(\sqrt{4}+\sqrt{3})}\right\}\right]$$

$$=\left\{\frac{(\sqrt{6}+\sqrt{5})}{(\sqrt{6})^2-(\sqrt{5})^2} - \frac{(\sqrt{5}+\sqrt{4})}{(\sqrt{5})^2-(\sqrt{4})^2} + \frac{(\sqrt{4}+\sqrt{3})}{(\sqrt{4})^2-(\sqrt{3})^2}\right\}$$

$$=\left\{\frac{(\sqrt{6}+\sqrt{5})}{6-5} - \frac{(\sqrt{5}+\sqrt{4})}{5-4} + \frac{(\sqrt{4}+\sqrt{3})}{4-3}\right\}$$

$$=\{(\sqrt{6}+\sqrt{5}) - (\sqrt{5}+\sqrt{4}) + (\sqrt{4}+\sqrt{3})\}$$

$$=(\sqrt{6}+\sqrt{5}-\sqrt{5}-\sqrt{4}+\sqrt{4}+\sqrt{3})$$

$$=(\sqrt{6}+\sqrt{3})$$

Conclusion:

All the algebraic numbers and functions can be rationalized and simplified for the ease of calculation.

Debadreet Banik
Class: VII H

PHOTO Gallery

Children During The Fun with Maths Activities

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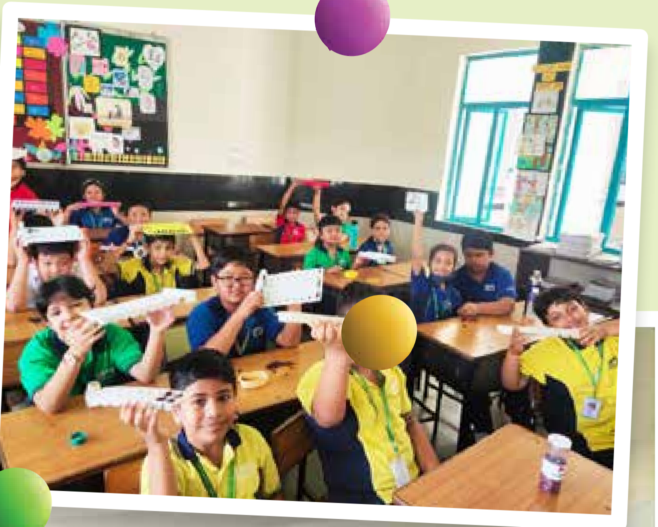

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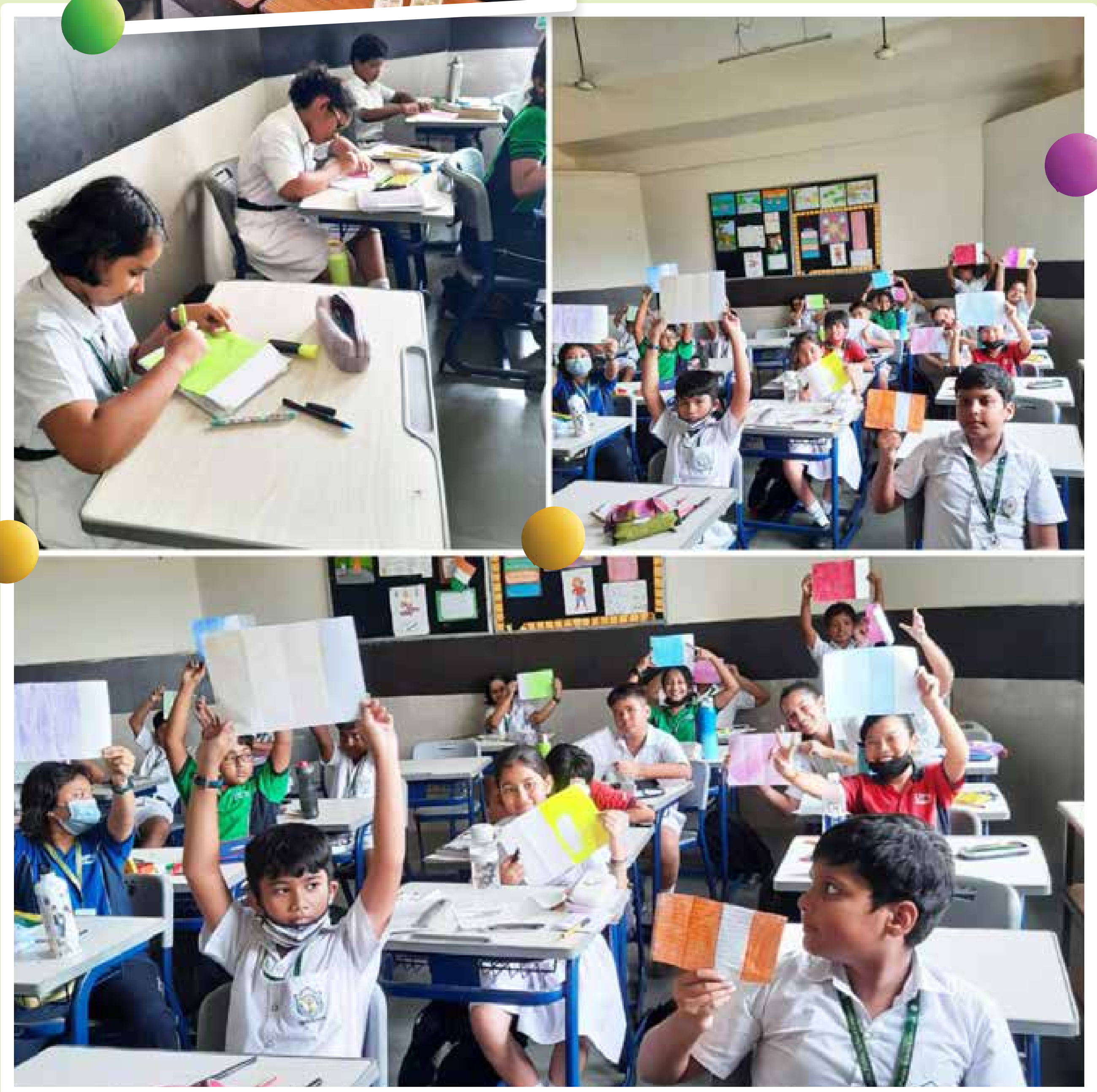

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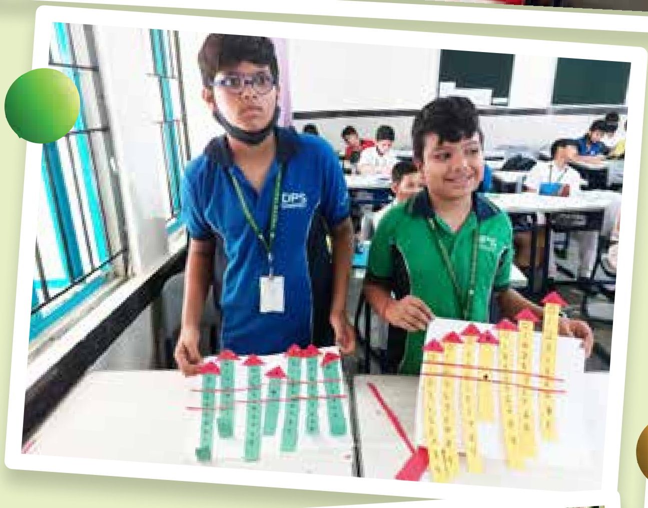

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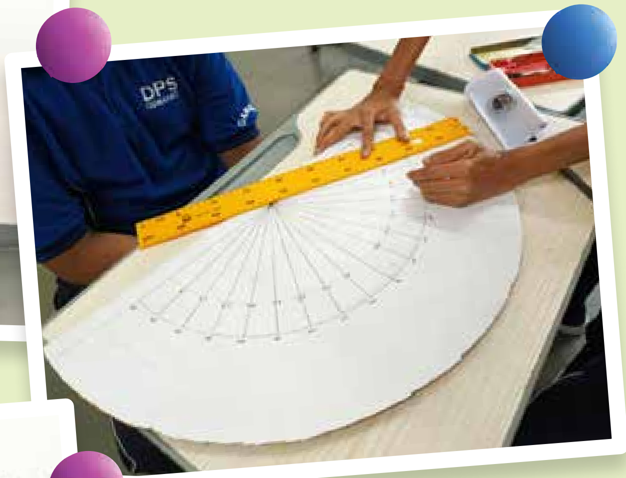

Peer Training Programme

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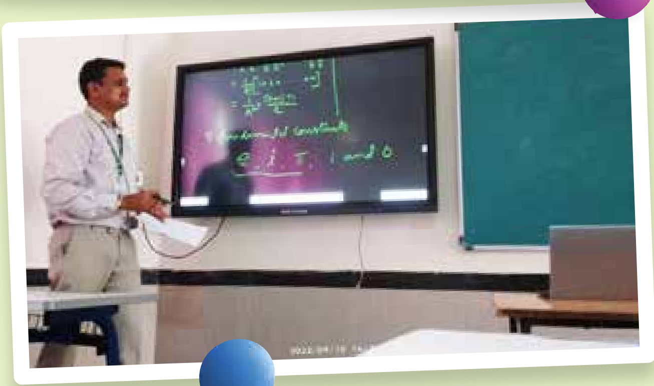

Sir Isaac Newton

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