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$E = mc^2$ **Pr (a)**

AN ELEMENTARY PROOF OF

BIRCH AND SWINNERTON DYER CONJECTURE

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ABSTRACT

Answer Is Hidden In Question Actually. This New Paper Has Been Designed As Per The Requirements Of Navier Stokes With The Solution Of Birch And Swinnerton Dyer Conjecture. Geometry is hidden natural patterns too. You must notice the seed in a Sun flower. If you look closely they look spiral shape design other best example is Spiral Galaxy. From ancient times people were aware of geometry and used it day to day life. From ancient times people were aware of geometry and used it day to day life.

In ancient Egypt, there was a problem every year. The Nile River used to flood each year and whenever it flooded, it used to destroy the boundaries of the land near the banks of the river. This used to put land owner in the problem. After the flood the boundaries of lands would dissolve away. Nobody would know which parts of land belong to whom and this will result in confusion. As this was an annual problem. They came up

A system of

Measuring land

Redistributing of land to owners after the flood

This system of measuring was one of the factors that gives birth word GEOMETRY which we study today. The word Geometry is Greek word.

Geo meaning Land or Earth and Metrein means Measurement.

The geometry means the measurement of earth.

Euclid is a Greek mathematician. He collects all geometry information in books names "Elements". It contains Definitions, Axioms, Postulates, and Proof.

Keywords: Nyaysangat Foundation

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INTRODUCTION

In particular solution of BIRCH AND SWINNERTON DYER CONJECTURE equation include NAVIER STOKES which remains one of the greatest unsolved problems in physics, despite its immense importance in science and engineering. For the three dimensional system of equations, and given some initial conditions, mathematicians have not yet proved that smooth solutions always exist, or that if they do exist, they have bounded energy. This is called the Navier – Stokes existence and smoothness problem.

This series for NAVIER STOKES to BIRCH AND SWINNERTON DYER CONJECTURE has been designed as per the requirements of the puzzle. The content is designed develop to make learner of mathematics fun and enjoyable and thus making the journey to attaining a deeper understanding of the subject and mathematical concept a pleasurable one.

Model – Can be helpful in evaluation and self – assessment of the understanding of the topics learnt.

The basis of understanding the multi – digit numbers lies in the understanding of the place value system. Thus, it is important to start with the concept of place value through manipulates like place value cards, spike abacus, unfix cubes and expended and short form of numbers. National and International Place Value Charts.

Aim : To solve the puzzle with gaining a broader and deeper understanding of the standard mathematics by having many and varied opportunities to use concrete materials such as place – value charts, unifix cubes and base ten blocks in problem, solving situation. Binary system can manipulate data more broadly.

BIRCH AND SWINNERTON DYER CONJECTURE

Conjecture Meaning: to guess based on the appearance of a situation and not on proof.

Proof is hidden behind the name “BIRCH”

IN MATHEMATICS

The Birch and Swinnerton – Dyer conjecture describes the set of rational solutions to equations defining an elliptic curve. It is an open problem in the field of number theory and is widely recognized as one of the most challenging mathematical problems.

Answer is behind the question that is “Rational Root Theorem”

The rational root theorem describes a relationship between the roots of a polynomial and its coefficients. Specifically, it describes the nature of any rational roots the polynomial might possess.

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BASIC EUCLID DEFINITIONS

1. Euclid defines "A point is that which has no part" Everything will be based on a point. No length, no depth, no size. Place similar points closely one after the other we see it appears as a line. So line is basically a closely spaced a collection of points one after other.
2. Euclid defines - A surface is that which has length and breadth only. Draw and look closely at the edges of the surface. We will find that the boundary of the surface is nothing but lines. So, we can say edges of the surface are lines.
3. Euclid defines – A plane surface is a surface which lies evenly with the straight lines on itself.

PROOF BEGINS WITH LIFE – In three and a half billion years life on Earth has transformed from single cells to complex multicellular organisms. Life permeates all environments on Earth and is defining characteristic of our planet. It occurs in the biosphere, a thin layer between the upper part of Earth's troposphere and the topmost layers of porous rocks and sediments. The size and nature of the biosphere has grown and changed overtime, as has the relationship between organic and inorganic elements in the biosphere.

Photosynthesis is a life process powered by the sun. Directly or indirectly through the food chain., it fuels most life on Earth. Photosynthesis is carried out by green plants and some types of algae as well as by cyanobacteria. (formely known as blue – green algae) and related organisms, which are responsible for most of the photosynthesis in oceans.

In the process of photosynthesis, plants capture sunlight and absorb carbon dioxide from the atmosphere. The light and Carbon dioxide combine with water, brought in by plant roots. The end product is sugars, food for the plant; a waste product is oxygen, respired out through the plant leaves.

Thus plants use the carbon dioxide that animals breathe out and provide the oxygen that animals breathe in.

Photosynthesis provides all the food we eat – plants and animals that eat plants – and the oxygen we breathe. If photosynthesis were to cease, the atmosphere's oxygen would likely be depleted within several thousand years.

Photosynthesis also created the raw materials for the fossil fuels we so depend on. Green plants formed the bulk of the organic deposits that through geological processes were transformed into coal, oil, and natural gas.

1. Special Pigments usually chlorophyll, in the leaves of plants capture sunlight and begin chemical reactions and create energy.
2. Pores in plant leaves, called stomates, take in carbon dioxide from the air.
3. The Pigment – Generated Energy fuels the creation of glucose, nutrition for the plant. At the same time, air and water are converted into oxygen, which exits the plant through the stomates.

Roots absorb water from the soil.

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FUNDAMENTAL THEOREM OF ALGEBRA

Carl Friedrich Gauss proved fundamental theorem in 1799. It states that every polynomial equation of degree *n* with complex number coefficients has *n* roots, or solutions, in the complex numbers.

RATIONAL ROOT THEOREM

In algebra, the rational root theorem (or rational root test, rational zero theorem, rational zero test or p/q theorem) states a constraint on rational solutions of a polynomial equation $a_n x^n+a_{n-1}x^{n-1}+\cdots+a_0=0$ with integer coefficients $a_i \in \mathbb{Z}$ and $a_0, a_n \neq 0$. Solutions of the equation are also called roots or zeroes of the polynomial on the left side. The theorem states that each rational solution x = p/q, written in lowest terms so that p and q are relatively prime, satisfies: p is an integer factor of the constant term a_0, and q is an integer factor of the leading coefficient a_n.

FINDING RATIONAL SOLUTIONS

How can we find rational root solutions?

It involves the rational roots Theorem, and Synthetic Division

A. Divide using synthetic division. State whether the binomial is a factor of the polynomial.

1. $(x^4 - 3x^2 + 6) \div (x + 1)$

-1	1	0	-3	0	6
		-1	1	2	-2
	1	-1	-2	2	4

$$= x^3 - x^2 - 2x + 2 + \frac{4}{x+1}$$

NOT a factor!

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7.1) Finding Rational Solutions

A. Divide using synthetic division. State whether the binomial is a factor of the polynomial.

2. $(x^3 + 2x^2 - 5x - 6) \div (x - 2)$

2	1	2	-5	-6
		2	8	6
	1	4	3	0

$= \boxed{x^2 + 4x + 3} = (x + 3)(x + 1)$

. . . giving roots x = -3. -1. 2

YES, is a factor!

. . . Giving zeroes x = -3, -1, 2

7.1) Finding Rational Solutions

A. Divide using synthetic division. State whether the binomial is a factor of the polynomial.

3. $(x^3 - 2x^2 - 33x + 10) \div (x + 5)$

-5	1	-2	-33	10
		-5	35	-10
	1	-7	2	0

$= \boxed{x^2 - 7x + 2}$

YES, is a factor.

the Quadratic Formula. The solutions to the equation $ax^2 + bx + c = 0$ are:

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

So, when you have $x^2 - 7x + 2 = 0$,

$$x = \frac{-7 \pm \sqrt{(-7)^2 - 4(1)(2)}}{2(1)} = \frac{-7 \pm \sqrt{49 - 8}}{2}$$

$$= \frac{-7 \pm \sqrt{41}}{2}$$

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7.1) Finding Rational Solutions

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-5	1	-2	-33	10
		-5	35	-10
	1	-7	2	0

$= \boxed{x^2 - 7x + 2}$ $\quad x = \frac{7 \pm \sqrt{49 - 4(1)(2)}}{2(1)}$

$\boxed{\text{YES, is a factor.}}$ Zeros are $x = -5, \frac{7 \pm \sqrt{41}}{2}$

B. The RRT allows us to narrow down our possible box #'s.
It works like this:
Let $a_0x^n + a_1x^{n-1} + \ldots + a_{n-1}x + a_n = 0$ represent a polynomial equation of degree n with integral coefficients.
Your possible ONLY possible box #'s are

$$\pm \frac{\text{factors of righty}}{\text{factors of lefty}} = \pm \frac{\text{factors of } a_n}{\text{factors of } a_0}$$

(zeros)

C. List all possible rational roots of $6x^3 + 11x^2 - 3x - 2 = 0$.

$$\pm \frac{\text{factors of 2}}{\text{factors of 6}} = \pm \frac{1, 2}{1, 2, 3, 6}$$

$$\boxed{= \pm 1, \pm 2, \pm \frac{1}{2}, \pm \frac{1}{3}, \pm \frac{1}{6}, \pm \frac{2}{3}}$$

D. Solve $6x^3 + 11x^2 - 3x - 2 = 0$.

Possible zeros

$= \pm 1, \pm 2, \pm \frac{1}{2}, \pm \frac{1}{3}, \pm \frac{1}{6}, \pm \frac{2}{3}$

Try the integers first!

1	6	11	-3	-2
		6	17	14
	6	17	14	12

NOT 0!

-1	6	11	-3	-2
		-6	-5	8
	6	5	-8	-6

2	6	11	-3	-2
		12	46	86
	6	23	-43	84

-2 ZERO

-2	6	11	-3	-2
		-12	2	2
	6	-1	-1	0

Now solve $6x^2 - x - 1 = 0$

Now solve $6x^2 - x - 1 = 0$

$(3x + 1)(2x - 1) = 0$

$3x + 1 = 0$ or $2x - 1 = 0$

Zeros are $x = -\frac{1}{3}, \frac{1}{2}, -2$

E. Find the zeros of $x^3 + 6x^2 - 13x - 6 = 0$.

2	1	6	-13	-6
		2	16	6
	1	8	3	0

Solve $x^2 + 8x + 3 = 0$

$x^2 + 8x = -3$

$x^2 + 8x + \mathbf{16} = -3 + \mathbf{16}$

$(x + 4)^2 = 13$

$x + 4 = \pm \sqrt{13}$

$x = -4 \pm \sqrt{13}$

Zeros are $x = 2, -4 \pm \sqrt{13}$

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F. Find the zeros of $f(x) = x^4 - 5x^2 + 4$. Then write the polynomial in factored form.

1	1	0	-5	0	4
		1	1	-4	-4
	1	1	-4	-4	0

1 is a zero. So, $(x - 1)$ is a factor. Now solve/factor $x^3 + x^2 - 4x - 4$.

$(x^3 + x^2) - (4x + 4)$ → $(x + 1)(x + 2)(x - 2)$

$x^2(x + 1) - 4(x + 1)$

$(x + 1)(x^2 - 4)$

So, $f(x) = x^4 - 5x^2 + 4 =$

$(x - 1)(x + 1)(x + 2)(x - 2)$

Zeros are $x = 1, -1, -2, 2$

AN ELLIPTIC CURVE

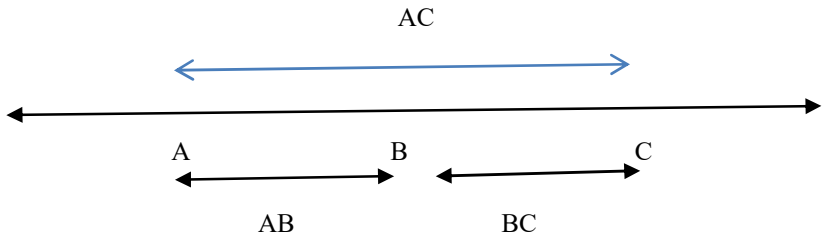
An elliptic curve is not an ellipse, and it may not be a curve in the usual sense. There is a connection between elliptic curves and ellipses, but its indirect. Elliptic curves are related to the integrals you would write down to find the length of a portion of an ellipse.

An elliptic curve is a

- Smooth, projective, algebraic curve, of genus one, having a specified point 0.

Working over real numbers, smoothness can be specified in the forms of derivatives. But that does smoothness mean working over a finite field? You can take the derivative equations from the real case and extend them by analogy to other fields. You can "differentiate" polynomials in settings where you can't take limits by defining derivatives algebraically (The condition 4a cube + 27b square not equal to 0 is to smoothness)

EUCLID'S GEOMETRY Statement means "TRUE" "MAYBE" "FALSE". For Ex – Statement will be TRUE – If we say Sun rises from east. Euclid's Axiom 4 – says that things which coincide with one another are equal to one another. Example – If A, B and C are three points on a line, and B lies between A and C, then prove that AB + BC = AC



So, we can say that AB + BC = AC

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EUCLID AXIOMS (Axioms means are obvious universal truth. (Everywhere)

1. Things which are equal to the same thing are equal to one another.
2. If equals are added to equals, the wholes are equal.
3. If equals are subtracted from equals, the remainders are equal.
4. Things which coincide with one another are equal to one another.
5. The whole is greater than the part.
6. Things which are double of the same things are equal to one another. A = B then 2A = 2B
7. Things which are heavier of the same things are equal to one another.

GEOMETRICAL NOTIONS – Euclid's approach today's world as an abstract model.

1. Solid is a 3Dimensional - A solid has shape, size, position and can be moved from one place to another
2. Plane Shape is 2Dimensional - Its boundaries are called Surfaces. They separate one part of the space from another, and are said to have no thickness.
3. Line is a 1Dimensional - The boundaries of the surfaces are curves or straight line.
4. No Dimension - These lines end in points.

Solids are 3 – dimensional, that is they have height along with length and breadth. Some common solids are -

Cone – a cone has 1 flat face and 1 curved face. It has 1 curved edge and 1 vertex. Some examples of cone are ice – cream cone, joker's cap, etc.

Cuboid – we can see that a cuboid appears to be a rectangle when viewed from any direction. A motor boat is a 3d shape.

Front view – side view – top view

When a solid is looked down from above, the view seen is called the top.

- **The front view is called the front elevation**
- **The side view is called the side elevation**
- **Examples – dice - top – side – front.**
- **The Water Cycle – through all three phases – solid, liquid, and vapor – and through many locations – underground, in bodies of water, in soil, and in the atmosphere – all the time. The total volume of water on Earth has likely remained constant since the planet's formation.**

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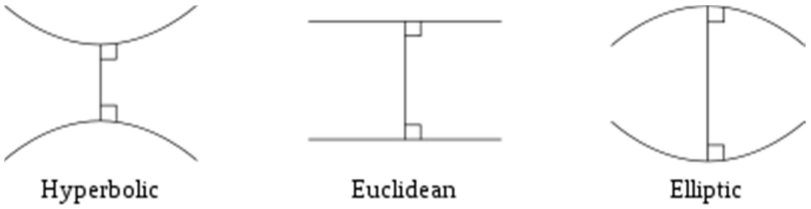
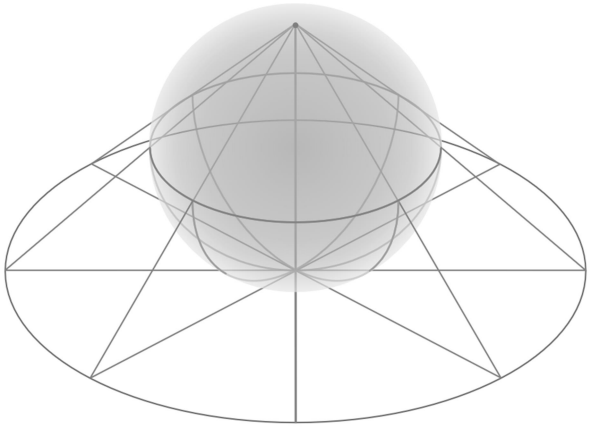
HOW CLOSE TO SOMETHING FROM ZERO

NON EUCLID GEOMETRY



Behavior of lines with a common perpendicular in each of the three types of geometry

In mathematics, non-Euclidean geometry consists of two geometries based on axioms closely related to those specifying Euclidean geometry. As Euclidean geometry lies at the intersection of metric geometry and affine geometry, non-Euclidean geometry arises when either the metric requirement is relaxed, or the parallel postulate is replaced with an alternative one. In the latter case one obtains hyperbolic geometry and elliptic geometry, the traditional non-Euclidean geometries. When the metric requirement is relaxed, then there are affine planes associated with the planar algebras which give rise to kinematic geometries that have also been called non-Euclidean geometry



PROJECTING A SPHERE TO A PLANE.

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COMPOSITION OF THE SOLAR SYSTEM

The Sun contains 99.85% of all the matter in the Solar System. The planets, which condensed out of the same disk of material that formed the Sun, contain only 0.135% of the mass of the solar system. Jupiter contains more than twice the matter of all the other planets combined. Satellites of the planets, comets, asteroids, meteoroids, and the interplanetary medium constitute the remaining 0.015%. The following table is a list of the mass distribution within our Solar System.

- Sun: 99.85%
- Planets: 0.135%
- Comets: 0.01%
- Satellites: 0.00005%
- Minor Planets: 0.0000002%
- Meteoroids: 0.0000001%
- Interplanetary Medium: 0.0000001%

The *plane of the ecliptic* is defined by the Earth's orbit around the Sun. All of the planets orbit the Sun roughly around this same orbital plane. The farther away from this plane a planet orbits, the more *inclined* is its orbit to the ecliptic. If you could look at the solar system "edge on" then all the planets would be orbiting more or less in the plane of the ecliptic.

Euclid's Postulate-Postulate means assumed truth without proof, or as self-evident (specific to geometry)

1st Postulate "A straight line may be drawn from any point to any other point".
2nd Postulate "A terminated line can be produced indefinitely"
3rd Postulate "A circle can be drawn with any centre and any radius"
4th Postulate "All right angles are equal to one another".
5th Postulate " If a straight line falling on two straight lines makes the interior angles on the same side of it taken together less than two right angles, then the two straight lines, if produced indefinitely, meet on that side on which the sum of angles is lies than two right angles.

Axiom – Given two distinct points, there is a unique line passing through them.

Informally, projective means "points of infinity" to make things more consistent

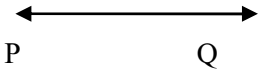
- Pairs of co – ordinate (x, y) but equivalence classes of
- Triples of co – ordinates (x, y, z). You can usually think in terms of pairs of values, but the extra value is there when you need it to deal with points at infinity.

One way to think of projective space is that we add a dimension, the extra co – ordinate, then subtract a dimension by taking equivalence classes. By doing so we almost end up back where we started, but not

quite. We have a slightly larger space that includes a couple "points at infinity, one of which will be our curve."

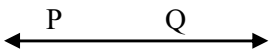
In the primary grades, we focus on features of two dimensional shapes and three dimensional figures.

Line Segment – A line segment extended on both the sides without an end is called a line. A line has no end points. A line is denoted by taking any two points on it.



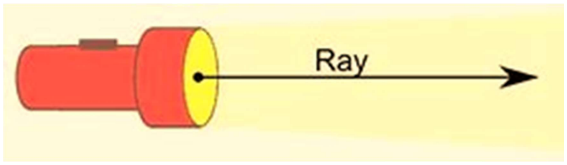
P Q

To name this line, we mark any points on it say P and Q. Then it is named as line PQ and represented



P Q

Ray – A ray is a straight path that has one endpoint and goes on and on in one direction. Ray (Coordinate Geometry) Definition: A line which starts at a point with has given coordinates, and goes off in a particular direction to infinity, possibly through a second point.



The formal study of light began as an effort to explain vision, which early Greek thinkers associated with a ray emitted from the human eye. A surviving work from Euclid, the Greek geometrician, laid out basic concepts of perspective, using straight lines to show why objects at a distance appear shorter or slower than they actually are. Light moves out in all direction from illuminated objects and that vision results when light enters the eye.

In the primary grades, we focus on features of two dimensional shapes and three dimensional figures.

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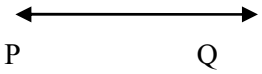

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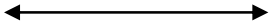

P Q

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Alternating tools – It's convenient to carry around an extra co – ordinate that mostly does nothing. But it is also inconvenient to have a mysterious extra point. So which is better? Much of the time you can ignore both the point at infinity and the extra co – ordinate. When , you have a choice which may you would rather think of things. The point at infinity may be easier to think about conceptually, and projective co – ordinate may be better for doing proofs

Concrete Example –

$y^2 = x^3 + x + 1$
over the integers. There are nine points on this curve: (0, ±1), (2, ±1), (3, ±1), (4, ±2), and ∞. (You could replace -1 with 4 and -2 with 3 if you'd like since we're working mod 5.)

In the three-coordinate version, the points are (0 : ±1 : 1), (2 : ±1 : 1), (3 : ±1 : 1), (4 : ±2 : 1), and (0 : 1 : 0).

We leave out (0, 0, 0). It doesn't exist in the world we're constructing, i.e. projective space.

From a programming perspective, you could think of z as a finiteness flag, a bit that is set to indicate that the other two coordinates can be taken at face value.

PROJECTIVE CO – ORDINATE – Z IS A SILENT PARTNER OF X AND Y MOST OF THE TIME

Instead of pairs of points (x, y), we consider equivalence classes of points (x, y, z) where two points are equivalent if each is a non-zero multiple of the other [1]. It's conventional to use the notation $(x : y : z)$ to denote the equivalence class of (x, y, z).

In this construction, the equation of an elliptic curve is

$y^2z = x^3 + axz^2 + bz^3$.
Since triples are in the same equivalence class if each is a multiple of the other, we can usually set z equal to 1 and identify the pair (x, y) with $(x : y : 1)$. The "point at infinity" corresponds to the equivalence class $(0 : 1 : 0)$.

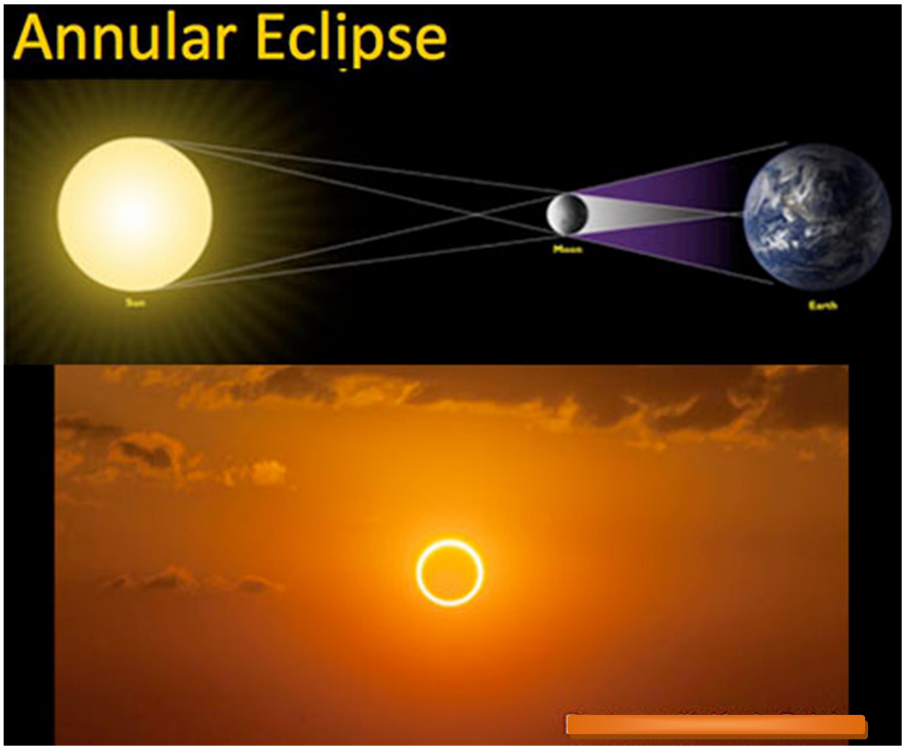
PROJECTIVE SPACE

This three-coordinate version is called projective coordinates.

Local Rings in between fields in rings

Localization – Local Rings in between fields in rings.

- ✓ Solar Eclipse "Ring of Fire" On 26th December 2019, an annular solar eclipse happened where the Sun rises as a "ring of fire". We know that an eclipse of the sun occurs when the moon moves in between the Sun and the Earth, thus blocking the sun rays and casting a shadow in certain parts of the Earth. But, what is an annular solar eclipse? The rare Annular Solar Eclipse 2019 cached on 26th December, the best place to view was Coimbatore. India is a witness of an annular solar eclipse.



Annular Means Ring-Shaped The name "annular" comes from the Latin word for ring, "annulus." These eclipses are named for their darkest, or maximum, point even if it only lasts less than a second. If the characteristic ring of fire is visible from even just one location, the whole eclipse is called an annular solar eclipse. During a solar eclipse, the moon casts two shadows on Earth.

IN MATHEMATICS

A ring is one of the fundamental algebraic structures used in abstract algebra. It consists of a set equipped with two binary operations that generalize the arithmetic operations of addition and multiplication. Through this generalization, theorems from arithmetic are extended to non-numerical objects such as polynomials, series, matrices and functions.

A ring is an abelian group with a second binary operation that is associative, is distributive over the abelian group operation, and has an identity element (this last property is not required by some authors. By extension from the integers, the abelian group operation is called *addition* and the second binary operation is called *multiplication*.

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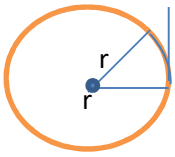
Whether a ring is commutative or not (that is, whether the order in which two elements are multiplied changes the result or not) has profound implications on its behavior as an abstract object. As a result, commutative ring theory, commonly known as commutative algebra, is a key topic in ring theory. Its development has been greatly influenced by problems and ideas occurring naturally in algebraic number theory and algebraic geometry. Examples of commutative rings include the set of integers equipped with the addition and multiplication operations, the set of polynomials equipped with their addition and multiplication, the coordinate ring of an affine algebraic variety, and the ring of integers of a number field. Examples of non-commutative rings include the ring of $n \times n$ real square matrices with $n \geq 2$, group rings in representation theory, operator algebras in functional analysis, rings of differential operators in the theory of differential operators, and the cohomology ring of a topological space in topology.

1. Parallel Lines – If perpendicular distance between two lines is always constant then they are called parallel lines.
2. Perpendicular Lines - If two lines intersect each other at right angle then they are said to be perpendicular to each other.
3. Line segment – A straight line drawn from one point to another point is called a line segment.
4. Square – A square is a quadrilateral having all side of equal length and all internal angles are 90 degrees.
5. Radius of Circle – Thales was the first mathematician to give a proof of a statement that "A circle is bisected by its diameter." The distance between center and circumference of a circle is called radius of circle.

RADIANS – OTHER WAY TO MEASURE ANGLES

Let's draw a circle, let point O at the centre and let r be its radius. And now take r and place it like red r and then push it to circumference at circle. The length of blue part will be still r. The curved length starts and ends. And centre of the circle we can draw other radius at the blue curve. We have an arc equal to the radius of the circle and two radii joining the centre end points of the arc. The length of the arc is equal to the radius of the circle. Angle formed in the centre of the circle will be radian.



According to various mathematicians this is the more logical way to measure angles. It is because we measuring angles in relation to the radius of the circle.

But how are radians related to degrees – circumference = 2 pi r

Number of arcs = 2 pi approx... 3.14One full rotation = 2Pi Radian

We know one full rotation is 360 degrees

2 Pi radians will be equal to 360 degrees.

That is the relation between degrees and radians.

2Pi Radians = 360 degrees (Full Rotation)

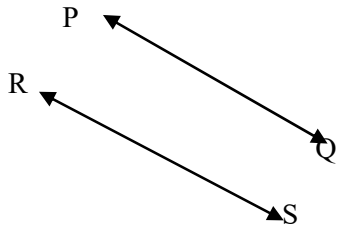
Pi Radians = 180 degrees (Straight Line)
Pi/2 Radians = 90 degrees (Right Angle)
These three relations are most important when it comes to conversion between degrees and radians.
1 Radian = 360 degrees/2Pi ~ 57.2958 degrees
WAVELENGTH (LAMBDA) - DISTANCE AFTER WHICH THE WAVES BEGIN TO REPEAT (UNIT: METRES). IT IS A RADIANT ENERGY IN ELECTROMAGNETIC ENERGY THAT TRAVELS IN TRANSVERSE WAVES.
Electric Field – An electric field describes the area near any electrically charged object. It could also call electrostatic field. Any other charge that enters that area will feel a force, and the original object will also feel that force. It is kind of like a spider sitting at the center of a web. At that point lightening can occur. For an electric field, things are little more complicated, since there are two kinds of charges, and some combinations attract while other repel.

PLANE – A PLANE IS A FLAT SURFACE.

In mathematics, a plane is a flat, two- dimensional surface that extends infinitely far. A plane is the two-dimensional analogue of a point (zero dimensions), a line (one dimension) and three-dimensional solid shape.

In geometry, a plane is a flat two-dimensional "surface" (similar to a sheet of paper, but with no thickness and no finite length or width). A plane is defined by three points, each of which forms a line with the other two points within the plane. In three dimensions, the simplest version of a plane would include all of the points with any x and y value that contain the same value for z. A plane is a flat surface or a 2-dimensional object, stretching to infinity in all directions.

Parallel Lines In geometry, parallel lines are lines in a plane which do not meet; that is, two straight lines in a plane that do not intersect at any point are said to be parallel. Colloquially, curves that do not touch each other or intersect and keep a fixed minimum distance are said to be parallel. A line and a plane, or two planes, in three-dimensional Euclidean space that do not share a point are also said to be parallel. However, two lines in three-dimensional space which do not meet must be in a common plane to be considered parallel; otherwise they are called skew lines. Parallel planes are planes in the same three-dimensional space that never meet.

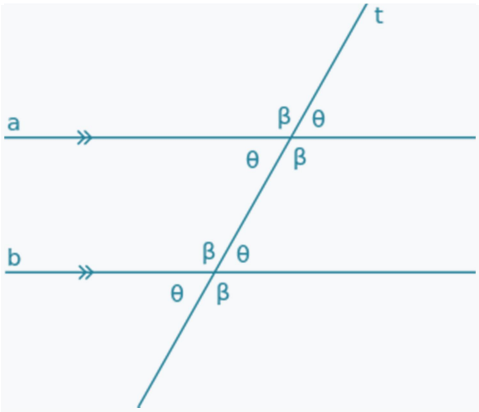


PQ | | RS Railway Lines are the best example of Parallel Lines

Euclidean parallelism

Two lines in a plane

Conditions for parallelism



As shown by the tick marks, lines *a* and *b* are parallel. This can be proved because the transversal *t* produces congruent corresponding angles , shown here both to the right of the transversal, one above and adjacent to line *a* and the other above and adjacent to line *b*.

Given parallel straight lines *l* and *m* in Euclidean space, the following properties are equivalent:

1. Every point on line *m* is located at exactly the same (minimum) distance from line *l* (*equidistant lines*).
2. Line *m* is in the same plane as line *l* but does not intersect *l* (recall that lines extend to infinity in either direction).
3. When lines *m* and *l* are both intersected by a third straight line (a transversal) in the same plane, the corresponding angles of intersection with the transversal are congruent.

Since these are equivalent properties, any one of them could be taken as the definition of parallel lines in Euclidean space, but the first and third properties involve measurement, and so, are "more complicated" than the second. Thus, the second property is the one usually chosen as the defining property of parallel lines in Euclidean geometry. The other properties are then consequences of Euclid's Parallel Postulate. Another property that also involves measurement is that lines parallel to each other have the same gradient (slope).

Intersecting Line – The lines that cross each other at a point are called intersecting lines.

Definition of Intersecting Lines. Lines that have one and only one point in common are known as intersecting lines. A minimum of two lines is required for intersection. The common point where all the intersecting lines meet is called the Point of Intersection.

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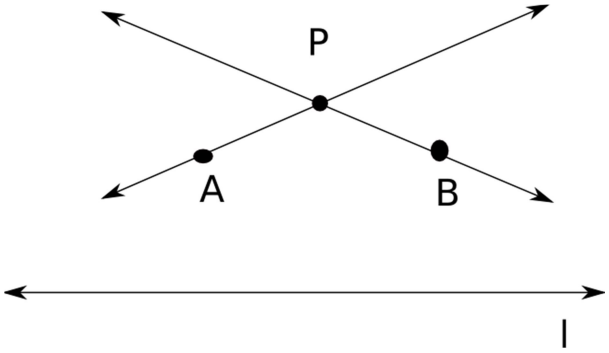

An example of the intersecting line or (line segment)

Crossing where two roads meet and cross each other

OBSERVATION

History:

The traditional Indian navagrahas include Sun, Moon, Mars, etc. (in order of weekdays) plus Rahu and Ketu. The belief that planets exert great influence on life and events of individuals and world gave rise to planet worship among various peoples.

For worship in a mandala (symbolic diagram) various geometrical figures and forms were used to reprent the planets. These include square, circle, semi – circle, triangle, pentagon, bow – figure and the popular lotus figure. The figures of square, circle and semi – circle are associated with the three nitya – agnis (‘obligatory fires’) whose Aryan tradition is older than the Rigveda which is the oldest of the four Vedas.

The discovery of the regular solids of polyhedral led the Greeks to connect them with the elements. There are five such regular polyhedral which are also called by other names such as Platonic solids, mathematical figures, and cosmic figures. In the final tally, the Greeks believed that the figure tetrahedron (or triangular pyramid) corresponds to fire, cube to earth, octahedron to air, icosahedrons to water, and the dodecahedron to the sphere of the universe (the vessel of the sphere itself was taken to be the fifth body or element).

In ancient India, the traditional number of gross elements was five and these were called panca – maha – bhutas (‘the five gross elements’). The whole brahmanda (universe or cosmos) is pervaded by these elements which are ksiti (earth), jala (water), pavaka (fire), vayu (air), and akasa which is variously translated as sky, heaven, ether or empty space (which must be distinguished from the corporeal and invisible air).

“ The circle is the mandala (symbolic diagram) of the heaven or sky; the (circle) decorated by six dots is (the figure) of wind; the triangle with svastika is that of fire; the half – moon (i. e. semicircle) with lotus is that of water; and the square with vajra (thunderbolt weapon, figure or diamond like figure) that of earth. The wisemen have thus spoken of the above mandalas for the respective bhutas.

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In interesting to note that while the Greeks connected the gross elements with three- dimensional solid figures. The case of elements is mentioned here just to point out that there was a tradition of connecting geometrical figures with them.

Their age – old geometrical association is described in the cognate text Saradatilaka.

The modern heliocentric astronomy has nine planets in our solar system. These are Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune, and Pluto.

They are listed in the order of their increasing distances from the Sun around which they revolve with different periods of revolution (ranging from 0.24 to 248.43 years). Uranus was discovered in 1781, Neptune in 1846, and Pluto in 1930.

The pre – heliocentric (or pre – Copernican) concept or ancient definition of planet was different. The ancient astronomy was geocentric and so Earth was not taken as a graha. In addition to the Sun and the Moon, the ancient peoples could find, by naked eye's observations, only the following five planets: Mars, Mercury, Jupiter, Venus, and Saturn. These seven heavenly shining bodies were found to have angular motions relative to fixed stars. They constituted the early list of seven planets after whom the weekdays are named in order from Sunday to Saturday. The current universal practice of using almost the same and similar names of seven weekdays and in exactly same order throughout the world indicates that the present concept of a 7 day week was most probably started in a single place and diffused to other places (according to diffusion theory).

Ancient peoples believed that the positions and configurations of planets have great influence on the life of individuals and on the course of events in the world and nature.

Religious Definition -

- 8000 B.C. Tally marks used in Congo region.
- 7500 B.C. Sumerians track grain, animals, and valuables with clay tokens.
- 3400 B.C. Egyptians use marks up to nine and special symbol for ten
- CIRCA 3100 B.C. Symbol on clay tablets in Sumeria use a wedge for one, a circle for ten; Babylonian base – 60 system expresses quantity by symbol and position.
- 300 B.C. Hindu Arabic numerals in India include zero as placeholder.
- 50 B.C. Base – 10 system with numerals akin ours used in India.

i. Systems for counting and measuring are among the oldest and basic human innovations. Both major cultures and minor tribes have developed their own ways to quantify the world.

ii. The carat, used as a unit of weight for precious gems, was originally based on the weight of certain seeds, but it has been standardized to equal 0.2 gram.

iii. The metric system originally calculated the meter – its basic unit – as one ten-millionth of the distance from the Babylon, located in modern – day Iraq, was one of the first societies complex enough to need modern record keeping. The ancient Babylonians were therefore among the first to develop a sophisticated counting systems.

iv. They developed positional numbering – the system whereby not only a symbol but also its position relative to other symbols expresses value. Positional numbering allowed large quantities to be expressed with simple symbols pressed into clay tablets.

v. The Babylonian sexagesimal, or base – 60, system grouped number by sets of 60 – 60 square, 60 Cube, and so on – just as modern counting uses the symbol 1 for sets of 10: 10square (100), 10Cube (1,000).

vi. Clay tablets have come down through history that clearly show the Babylonians advanced understanding of numbers. The tablet known as Plimpton 322 shows a sequence of numbers that appear to express the equation "x square + y square = z square". Later be called the Pythagorean Theorem.

vii. Base Number – An arbitrarily chosen whole number greater than 1 in terms of which any number can be expressed as a sum of that base raised to various powers. Systems through history have used different numbers as their group unit, or base, but over time the decimal system – a base – 10system – overshadowed all others. / Sunya: From the Sanskrit for "Vacant. In positional number systems, a symbol is required to mark the place of a power of the base not actually occurring. Hindus developed the sunya, a dot or small circle, the first use of the concept.

PHYSICS

The study of what the world is made of – the underlying "stuff" that gets turned into stars, planets, and people – and how it functions. It thus serves as a set of ground rules for chemistry, biology and other sciences.

Newton's Three Laws of Motion –

The basic concept of mechanics is that a force applied at one point can overcome friction, gravity, and other forms of resistance to produce motion at another. This physical law has been long understood, and inventors have devised machines in order to amplify the effect, allowing larger amounts of resistance to be overcome with less power.

- First Law – An object at rest or in motion stays as is unless acted upon by an external force.
- Second Law – The external force upon a body equals the body's mass times its acceleration.
- Third Law – For every action there is an equal and opposite reaction.

I. String Theory – The search for a common thread by which to explain the universe has turned into just that – a theory stating that gravity, electromagnetism, and the strong and weak forces that hold atoms together all connect through the vibrations of infinitesimal strings of energy.

II. The mathematical model describing the bond between protons and neutrons suggested energy to be a vibrating filament.

III. Quark, Knots and Quantum Theory – It can be hard to make sense of knot to know if it can be untangled. It is equally hard to know if two tangles are equivalent.

This might not sound like math, if you think that math is just adding, subtracting, multiplying and dividing. But actually in the 20th century, mathematicians developed a rather keep theory of knots with surprising ways to answer the questions like whether a given tangle can be untangled. Even though, knots are things that can exist in three – dimensional space.

Engineering – involves the application of energy to material to create something – a building, a monument, a network of computers.

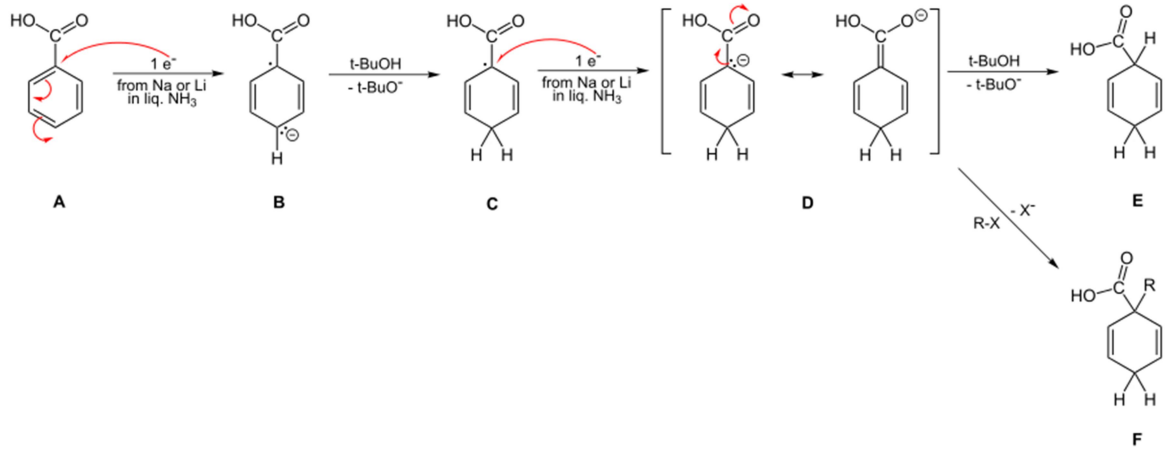
CHEMISTRY – People manipulated substances found in nature long before chemistry became an organized pursuit. How does the periodic table work? By arraying elements in rows and columns, placing like substances in vertical groups, Mendeleyev accurately predicted that other elements would eventually be discovered. Later the chart was reorganized to reflect the proton count in an atom's nucleus – an element's atomic number. It contains 118 elements, as many as 90 of which occur naturally.

Every element is represented by its atomic number, alphabetical symbol, and atomic weight in the periodic table.

BIRCH REDUCTION WITH ELECTRON WITHDRAWING SUBSTITUENTS

In contrast to the examples with electron donating substituents, the case with withdrawing groups is more readily obvious. Thus, as depicted below, the structure of the penultimate dianion D is characterized by its being subject to trapping by alkyl halides.

Mechanism of reduction of benzoic acids, including possible alkylation

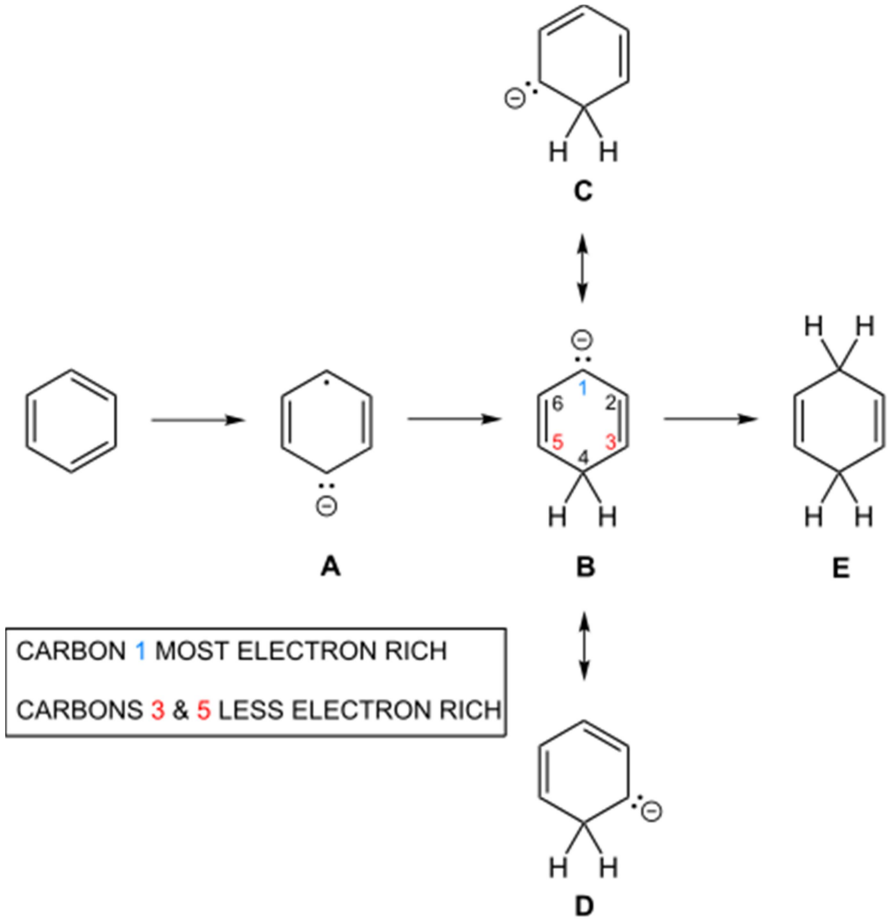


This dianion results independent of whether alcohol is used in the reduction or not. Thus the initial protonation by *tert*-butyl alcohol or ammonia is *para* rather than ipso as seen in the step from B to C

SECOND STEP OF THE BIRCH REDUCTION WITH REGIOCHEMISTRY GIVING UNCONJUGATED CYCLOHEXADIENES

The second step of the Birch reduction affording unconjugated cyclohexadienes also poses mechanistic questions. Thus as shown in the figure below there are three resonance structures B, C and D for the carbanion. Simple Hückel computations lead, as noted in the first entry of the table below, to equal electron densities at the three atoms 1, 3 and 5. However, in contrast to densities the Hückel computation is less naive about bond orders, and bonds 2–3 and 5–6 will be shortened as shown in the first entry of the table. With bond orders modifying simple exchange integrals in a Mulliken-Wheland-Mann computation it was shown that electron density at the central atom 1 become largest. More modern RHF computations lead to the same result.

Electron introduction to benzene and 3 resonance structures for the carbanion of the second step, and central protonation to give the unconjugated diene:



Five carbons of the cyclohexadienyl anion.

Approximation	Density Atom 3	Density Atom 2	Density Atom 1	Bond Order 2–3	Bond Order 1–2
Hückel (1st approx)	0.333	0.00	0.333	0.788	0.578
2nd approx	0.317	0.00	0.365	0.802	0.564
3rd approx	0.316	0.00	0.368	0.802	0.562

There are known precedents for central anion protonation. Thus conjugated enolates as C=C-C=C-O- have been known for some time as kinetically protonating in the center of the enolate system to afford the β,γ-unsaturated carbonyl compound under conditions where the anion, and not the enol, is the species protonated.

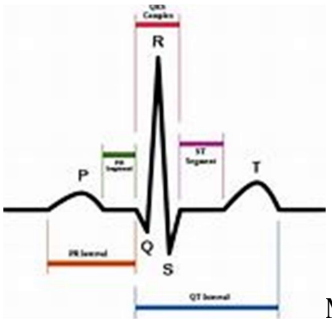
MEDICAL SCIENCE- Electrocardiography is the process of producing an electrocardiogram *(*ECG or EKG), a recording – a graph of voltage versus time – of the electrical activity of the heart using electrodes placed on the skin. These electrodes detect the small electrical changes that are a consequence of cardiac muscle depolarization followed by repolarization during each cardiac cycle (heartbeat). Changes in the normal ECG pattern occur in numerous cardiac abnormalities, including cardiac rhythm disturbances (such as atrial fibrillation and ventricular tachycardia), inadequate coronary artery blood flow (such as myocardial ischemia and myocardial infarction), and electrolyte disturbances (such as hypokalemia and hyperkalemia).

In a conventional 12-lead ECG, ten electrodes are placed on the patient's limbs and on the surface of the chest. The overall magnitude of the heart's electrical potential is then measured from twelve different angles ("leads") and is recorded over a period of time (usually ten seconds). In this way, the overall magnitude and direction of the heart's electrical depolarization is captured at each moment throughout the cardiac cycle.

There are three main components to an ECG: the P wave, which represents the depolarization of the atria; the QRS complex, which represents the depolarization of the ventricles; and the T wave, which represents the repolarization of the ventricles.[6]

During each heartbeat, a healthy heart has an orderly progression of depolarization that starts with pacemaker cells in the sinoatrial node, spreads throughout the atrium, and passes through the atrioventricular node down into the bundle of His and into the Purkinje fibers, spreading down and to the

left throughout the ventricles. This orderly pattern of depolarization gives rise to the characteristic ECG tracing. To the trained clinician, an ECG conveys a large amount of information about the structure of the heart and the function of its electrical conduction system. Among other things, an ECG can be used to measure the rate and rhythm of heartbeats, the size and position of the heart chambers, the presence of any damage to the heart's muscle cells or conduction system, the effects of heart drugs, and the function of implanted pacemakers.



Measuring electrical activity of the heart to detect cardiac problems.

Type: Imaging
Duration: Usually 15-20 mins
Results available: Almost immediate
Is Invasive: Noninvasive
Ability to confirm condition: Low to moderate
Ability to rule out condition: Moderate to high
Normal value(s): 60-100 beats per minute

APOPTOSIS –

From Greek apo + ptosis, "falling from." The process by which a body routinely kills off and replaces damaged or used – up cells – sloughing off dead skin, for example – at a rate of perhaps 70 billion cells a day; it may have a role in therapies to prevent cancer.

MATHEMATICALLY EXPLAINED AND PROVED HOW INTRICATE PIECES SMALL PIECES CAN BE FIT TOGETHER

There are certain relation between geometry and topology.

Topology it is from an area of math called Topology which is to do with kind of shape and how things fit together in space. It is typically about Spheres, so a common idea in topology is the idea of deforming things, so you can take dough cube and in topology move things around little bit. It is sometimes called rubber sheet geometry so we can take dough cube. You can make mess around with it. And you can round it off like that and get a sphere. The theory of Poincare conjecture is that you are allowed to squash things stretch things and all that kind of things but you are not allowed to punch in things you are not allowed to make a hole and you are not allowed to close up a hole. Because the number of holes that something has is very important, so this sphere has zero holes. You can have like donut which has exactly one hole. And you cannot get from a sphere to a donut by deforming it without kind of closing up this hole or by cutting

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it here and straightening it out and squashing that sausage into a sphere you are not allowed to cut and stick so the kind of things that are different from each other spheres are different from donuts which are different again from like a pretzel with two holes in it or something with three holes in it or any number of holes this is kind of math's that we studied at university for a very long time and did some very difficult. Poincare conjecture suggested that if you have an object which does not have any holes in it so first condition no holes. Second condition is that it is kind of small. It is not it does not go on forever in any direction, so it is it is kind of finite. You could may be put in a box and close the lid then a sphere or at least it can be made into a sphere and in two dimensions while in three dimensions where we live this seems like a fairly sensible statement, but Poincare suggested that this would hold in any number of dimensions so we can take this is a three – dimensional sphere. But we could have a two – dimensional sphere would be a circle you can also go up and have a four – dimensional sphere which you have to imagine a sphere with an extra dimension. A fixed radius in this one has a fixed radius in three different directions, but the Four – dimensional sphere has another direction in which it is still this size and any number of dimensions above that it can be counterproductive.

I AM USING "EINSTEIN'S" FORMULA $E = mc^2$ AND ADD Pr (a) TO SOLVE THIS EQUATION

As we know –

Einstein's two postulates –

I. Physical laws are the same in all frames of reference. That is; any event with in apportion of space (a frame) can be specified by three spatial dimensions (east – west, north – south, up – down) and one temporal dimension (time). Also, the laws that apply to us in everyday circumstances (such as Newton's Laws) also apply within each frame of reference.

II. The speed of light is constant
Energy = mass x the speed of light squared.
According to the theory of General Relativity object curve the space around them.
Einstein was the first to propose that the equivalence of mass and energy is a general principal and a consequence of symmetries of space and time.

By using the invariance principle, I am proving by $E = mc^2$ Pr (a)

We know that –

System within portion of space (a frame) can be specified by four spatial dimensions (east – west, north – west, up – down, time)

I ALREADY PROVE THAT – ANY COMPACT SIMPLE GAUGE GROUP G, A NON – TRIVIAL QUANTUM YANG MILLS THEORY EXISTS ON R4 AND HAS A MASS GAP DELTA > 0

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SYMMETRIES OF SPACE – Time absolutely central to physics but most physicists did not see it that way, certainly not in a mathematically general way.

SPACE AND TIME - : "In an everyday co –ordinate system, such as a map it is possible to specify a location using just dimensional distances. For example, to someone looking for buried treasure we could say, "go east for 20 miles, north for 5 miles, then dig down 30 feet." We have just specified a three dimensional co - ordinate system. Einstein added another factor that is time. This still makes sense in our everyday world.

Einstein added time and I want to add sound of words -

System within a portion of space (a frame) can be specified by four spatial dimensions (east – west, north – west, up down, time) with correct sound of words without tampering.

For Example – "Go east for 20 miles, north for 5 miles, dig down 30 feet, and then add sound of words to specify a location for fourth dimension, and then wait until that time when GOD meets you to share the treasure!"
Suppose –

We take these seven individual peoples like they have molecules that grouped together in tightly organized patterns – Meaning of these Indian name written as Star, Protect, King, A new life, Meditation and Prayer, Pride, Light Music – To construct these name in one form we get beautiful religious definition – A Pattern where important information is hidden cryptographically

1) Swati Star
2)Guard Protect
3) Narinder King, King's Kingdom
4) Nabaneeta A NEW LIFE
5) Mala Meditation and Prayer
6) Gaurav Pride
7) Deepika - Light, Music

PATTERN will be

"A LIGHT OR MUSIC IN A NEW LIFE CAN BE PROTECTED BY MEDITATION AND PRAYER TO REACH THE STAR FOR PRIDE IN KING'S KINGDOM".

There is a probability that the different molecules have different vibrations but we can assume this message from 4th Dimension instead of 3. We can suppose this is a secret message in figurative language.

There is a probability that the different molecules have different vibrations but we can assume this message from 4th Dimension instead of 3. We can suppose this is a secret message in figurative language.

IN MODERN PERIODIC LAW
THE p – BLOCK ELEMENTS (GROUP 15)

Here we can consider Group 15 Elements (ns2 np3)

We can apply Group 15 Elements on these names

Swati	Star	(s)
Guard	Protect	(p)
Narinder	King, King's Kingdom	(N)
Nabaneeta	A NEW LIFE	(N)
Mala	Meditation and Prayer	(p)
Gaurav	Pride	(p)
Deepika -	Light / Music	(s)

Modern Periodic Law
All physical and chemical properties of an element are a periodic function of Atomic No.

Similarly,
When elements are arranged in order of increasing Atomic number, then elements with similar properties are repeated after fixed interval. So as these messages like CICADA 3301, WOW Message, and message which I assume –

"A LIGHT OR MUSIC IN A NEW LIFE CAN BE PROTECTED BY MEDITATION AND PRAYER TO REACH THE STAR FOR PRIDE IN KING'S KINGDOM".

Here we can consider Group 15 Elements (ns2 np3) forms of life constantly moving about the Earth through the water.
Like all "stuff", water is made up of molecules. Maybe you have heard water called H the molecule that makes up water. The H stands for atoms and the O for up of two hydrogen atoms and one oxygen atom.

A hydrogen bond is a partially electrostatic attraction between hydrogen (H) atom which is bound to a more electronegative atom such as nitrogen (N), oxygen (O), or fluorine (F) and another adjacent atom bearing a lone pair of electrons.

A hydrogen bond is the electromagnetic attraction between polar molecules in which hydrogen is bound to a larger atom, such as oxygen or nitrogen. This is not sharing of electrons, as in a

covalent bond. Instead, this is an attraction between the positive and negative poles of charged atoms.

IN MATHEMATICS – The mathematics field of probability has its own rules, definitions, and laws, which you can use to find the probability of outcomes, events, or combinations of outcomes and events. To determine probability, you need to add or subtract, multiply or divide the probabilities of the original outcomes and events.

The probability formula –
The probability of an event = Number of favorable outcomes / Total number of possible outcomes.

Probability tells us which outcome – heads or tails – is more likely to occur in any given event.

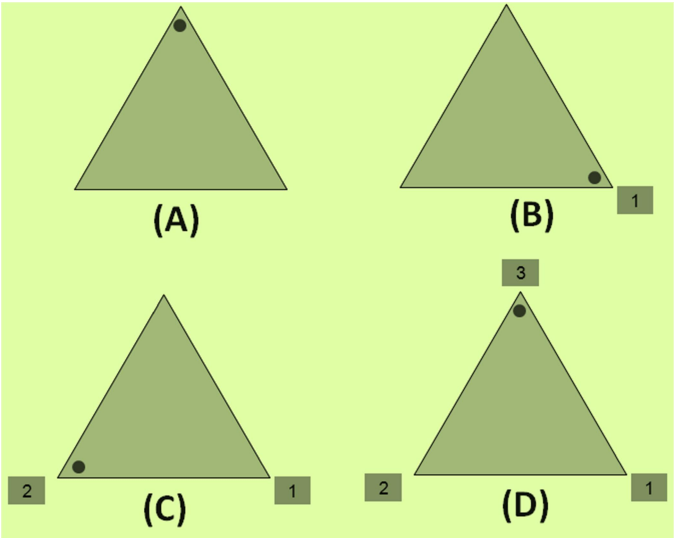
IN ABSTRACT ALGEBRA

A field is an algebraic structure with notions of addition, subtraction, multiplication, and division, satisfying certain axioms.

We know that the order of rotational symmetry of an equilateral triangle

As explained in the definition, we have to check how many times an equilateral triangle fits on to itself during a full rotation of 360 degrees.

Please look at the images of the equilateral triangle in the order A, B and C. A is the original image. The images B and C are generated by rotating the original image A.



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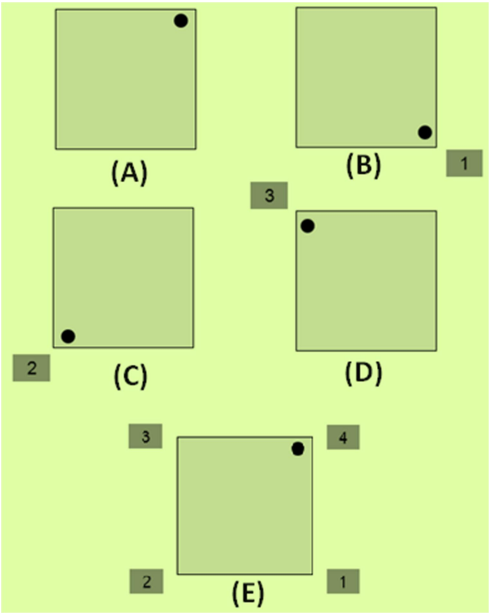
When we look at the above images of equilateral triangle, it fits on to itself 3 times during a full rotation of 360 degrees.

Hence, an equilateral triangle has rotational symmetry of order 3.

What is the order of rotational-symmetry of a square?

Solution:

Please look at the images of the square in the order A, B, C, D and E. A is the original image. The images B, C, D and E are generated by rotating the original image A.



When we look at the above images of square, it fits on to itself 4 times during a full rotation of 360 degrees.

HENCE, A SQUARE HAS ROTATIONAL SYMMETRY OF ORDER 4.

An algebraic curve is the set of points satisfying a polynomial equation.

The genus of an algebraic curve is roughly the number of holes it has. Over the complex numbers, the genus of an algebraic curve really is the number of holes. A theorem from a familiar context is taken as definition in a more general context.

The specified point 0, often the point at infinity, is the location of the identity element for the group addition

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Edward Curves – the addition formula is

$x^2 + y^2 = 1 + d\,x^2\,y^2$

where d is not 0 or 1 in the underlying finite field. Then addition on the curve is given by

$$(x_1, y_1) + (x_2, y_2) = \left(\frac{x_1 y_2 + x_2 y_1}{1 + d x_1 x_2 y_1 y_2}, \frac{y_1 y_2 - x_1 x_2}{1 - d x_1 x_2 y_1 y_2} \right)$$

When d is a square, there are some exceptions. When d is not a square, as will be the case in our application, the denominators are never zero, and so the formula above is all there is to the addition rule. Note that the division in the formula above is division in the underlying finite field, i.e. multiplication by the multiplicative inverse.

In 4th standard we study in mathematics about

PLACE VALUE SYSTEM is an even ancient invention of India, and is in built into the very language of Sanskrit. For instance, the name for eleven is **eka dasha** in Sanskrit where eka means one and dasha means ten. Note that this Sanskrit place value system is from the left, while modern place value system is from the right.

PERIODS: A number is split into groups called periods. For a 5 – digit number, the first three places from the right make the ones period and the next two make the thousands period. We separate the periods using commas or leave a short space.

Thus the number 15732 can be written as 15,732 or 15 732.

While reading a numeral, all the digits in the same period are read together and the name of the period (xcept the ones) is resd with the digits.

Let us read the number 53,204

Thousand Period

Ten Thousands	Thousands	Hundreds	Tens	Ones
5	3	2	0	4

We have 53,204 = Fifty-three thousand two hundred four.

Similarly, 50,372 = Fifty thousand three hundred seventy – two

We can represent 50,372 on the abacus also

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The basis of understanding multi – digit numbers lies in the understanding of the place value system. Thus, it is important to start with the concept of place value through manipulative like place value cards, spike abacus, unfix cubes and expanded and short form of numbers.

The value of a digit because of its place or position in a number is called its place value.
You can observe in 6 – digit Numbers (Indian Place Value System) also.

PLACE VALUES BY 6 DIGIT NUMBERS ONES TO HUNDRED THOUSANDS

Each number in a six digit number has a different place value.
The number 342,365

The 3 is in the hundred thousand place. It tells you there is 3 sets of hundred thousand, in the hundred thousand place.

100,000+100,000+100,000+=
300,000

The 4 is in the ten thousand place. It tells you there are 4 sets of ten thousand in the thousand place.

0,000+10,000+10,000+10,000 = 40,000
The 2 is in the thousands place. It tells you that there
are
2 sets of thousand in the thousands place.
1000+1000 = 2000
The 6 is in the tens place. It tells you there are 6 sets of
tens in the tens place
10+10+10+10+10+10=60
The 5 is in the ones place. It tells you
there are 5 ones in the ones place
1+1+1+1+1=5

300,000, 40,000 + 2000 + 300 + 60 + 5 = 342,365

The number 342,365 on a place value chart

The number 342,365 on a place value chart

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INDIAN PLACE VALUE CHART -

Place value tells us the value of each digit in a numeral based on its position. A place value chart helps us to recognize large numbers. We read place value chart from left to right. In Indian system we start grouping the number from right in group of 3 and further in group of 2.The place value chart have been separated into groups called periods i.e. ones, thousands, lakhs and crores.

Crores		**Lakhs**		**Thousands**		**Ones**		
Ten Crores (TC) (10,00,00,000)	Crores (C) (1,00,00,000)	Ten Lakhs (TL) (10,00,000)	Lakhs (L) (1,00,000)	Ten Thousands (TTh) (10,000)	Thousands (Th) (1000)	Hundreds (H) (100)	Tens (T) (10)	Ones (O) (1)

Let's read this number according to Indian Place Value Chart.

3,56,245 – Three lakh fifty six thousand two hundred forty five

1,23,50,005- One crore twenty three lakh fifty thousand five

INTERNATIONAL PLACE VALUE CHART

The place value that is used in many countries of the world is called International Place Value Chart. To understand the place value of each digit, we put the number in place value chart so that we can identify each digit. In International system we start grouping the number from right in group of 3, called period and we put comma or space after each period to make the number easily readable.

Millions			**Thousands**			**Ones**		
Hundred Millions (HM) (100,000,000)	Ten Millions (TM) (10,000,000)	Millions (M) (1,000,000)	Hundred Thousands (HTh) (100,000)	Ten Thousands (TTh) (10,000)	Thousands (Th) (1,000)	Hundreds (H) (100)	Tens (T) (10)	Ones (O) (1)

Let's read this number according to International Place Value Chart.

37,987,450 – Thirty seven million nine hundred eighty seven thousand four hundred fifty

100,000,150- One hundred million one hundred fifty

Let's compare the two number systems

Crores		**Lakhs**		**Thousands**		**Ones**		
Ten Crores (TC) (10,00,00,000)	Crores (C) (1,00,00,000)	Ten Lakhs (TL) (10,00,000)	Lakhs (L) (1,00,000)	Ten Thousands (TTh) (10,000)	Thousands (Th) (1000)	Hundreds (H) (100)	Tens (T) (10)	Ones (O) (1)
Millions			**Thousands**			**Ones**		
Hundred Millions (HM) (100,000,000)	Ten Millions (TM) (10,000,000)	Millions (M) (1,000,000)	Hundred Thousands (HTh) (100,000)	Ten Thousands (TTh) (10,000)	Thousands (Th) (1,000)	Hundreds (H) (100)	Tens (T) (10)	Ones (O) (1)

From above comparison we observe that

100 thousands = 1 lakh

1 million = 10 lakhs

10 millions = 1 crore

100 millions= 10 crores

Place Value and Face Value

Place value of the digit is the product of the face value of the digit and the value of its place whereas face value of a digit is the digit itself.

Let's find the face value and place value of 6 in 6, 45,100

Face Value is digit itself so face value of 6 in 6, 45,100 is '6'

Place Value of the digit is product of the face value of the digit and the value of its place so, place value of 6 in 6,45,100 is 6 x 1,00,000 = 6,00,000 (6 Lakh)

EXPANDED NOTATION

In expanded form, we expand each digit of a number to its place value.

Let's see expanded notation of the number 29,123

This can be expanded in three different ways:

1. 2 ten thousands +9 thousands + 1 hundred + 2 tens + 3 ones
2. (2 x 10,000) + (9 x 1,000) + (1 x 100) + (2 x 10) + (3 x 1)
3. 20000 + 9000 + 100 + 20 + 3

Standard form of 60000+4000+40+6 is 64,046

The Standard algorithm initially with one number in expanded form so that better understanding of standard algorithm is developed.

Example 23*3 = (20+3) * 3 = 20*3+3*3

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THE SCHEMATIC CODE SOLVING THIS EQUATION

FIGURE = EXPRESSION

EXPRESSION = NUMBERS

In arithmetic we have come across expressions like (2*10) +3, 3* 100 + (2*10) + 4 etc. These expressions are formed from numbers like 2, 3, 4, 10, 100 and so on. To form expressions we use all the four number operations of addition, subtraction, multiplication and division.

One important point must be noted regarding the expressions containing variables. A number expressions like (4*3)+5 can be immediately evaluated as (4*3) +5 = 12 + 5 = 17

But an expression like (4X + 5), which contains the variable X, cannot be evaluated. Only if X is given some value, an expression like (4X + 5) can be evaluated. For Example, when X = 3,

4X+5 = (4 * 3) + 5 = 17 as found above

12 + 5 = 17

Identify the operations (addition, subtraction, division, multiplication in forming the following expressions and tell how the expressions have been formed.

- Z + 1, Z – 1, y +17, y – 17

  A S A S (A = Addition, S = Subtraction)

- 2y + 17, 2y – 17

  M&A M&S (M = Multiplication, A = Addition, S = Subtraction)

- 7m, -7m+3, -7m-3

  M &A, M &S

Give expressions in the following cases

(a) 11 added to 2 m
 2m+11
(b) 11 subtracted from 2m
 2m – 11
(c) 5 times y from which 3 is subtracted
 5y – 3
(d) Y is multiplied by -8 and then 5 is added to the result
 -8y + 5
(e) Y is multiplied by 5 and the result id subtracted from 16
 16 – 5y

- Take Sarita's present age to be y years

a. What will be her age 5 years from now? y +5
b. What was her age 3 years back? y – 3
c. Sarita's grandfather is six times her age. What is the age of her grandfather? 6y
d. Grandmother is 2 years younger than grandfather. What is grandmother's age? 6y - 2
e. Sarita's father age is 5 years more than 3 times Sarita's age. What is her father's age? 3y +5

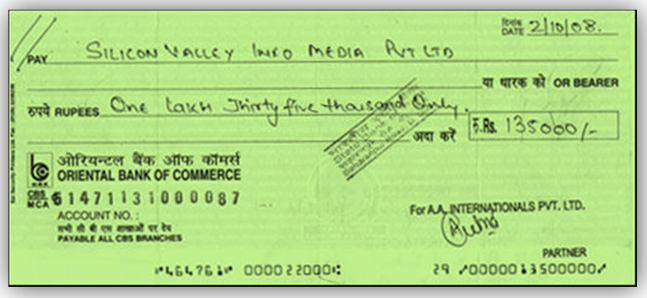
- Change the following statements using expressions to statements in ordinary language
  a. Ram puts q marbles on the table. He has 8q marble in his box.
  Ordinary Language – The number of marbles in the box is 8 times number of marbles on the table.
  b. Our class has n students. The school has 20n students.
  Ordinary Language – The number of student in a school is 20 times the number of students in our school.
  c. Krishna is z years old. His uncle is 4z years old and his aunt is (4z – 3) years old.
  Ordinary Language – Krishna uncle is 4 time Krishna's age. Krishna's aunt is 3 years younger than Krishna's uncle.

  What is an equation?
  An equation is a mathematical statement in which two things are equal.
  It is satisfied only for a definite value of the variable.
  X + 30 = 100 X = 70
  70+ 30 = 100 RHS

  LHS = RHS

- State which of the following are equations (with a variable). Identify the variable from the equations
  I. 16 = X + 7 variable X
  II. (L – 7) > 5 inequality
  III. (7*3) – 19 = 8 inequality
  IV. 2n + 1 = 11 It is an equation with variable n
  V. 7*4 – 8 = 3X It is n equation with variable X

Equation	Value of variable	Equation Satisfied
10y = 100	y = 100	Not satisfied
10y = 80	y = 80	Satisfied
P+3 = 1	P = 0	Not satisfied



Check is an another example-

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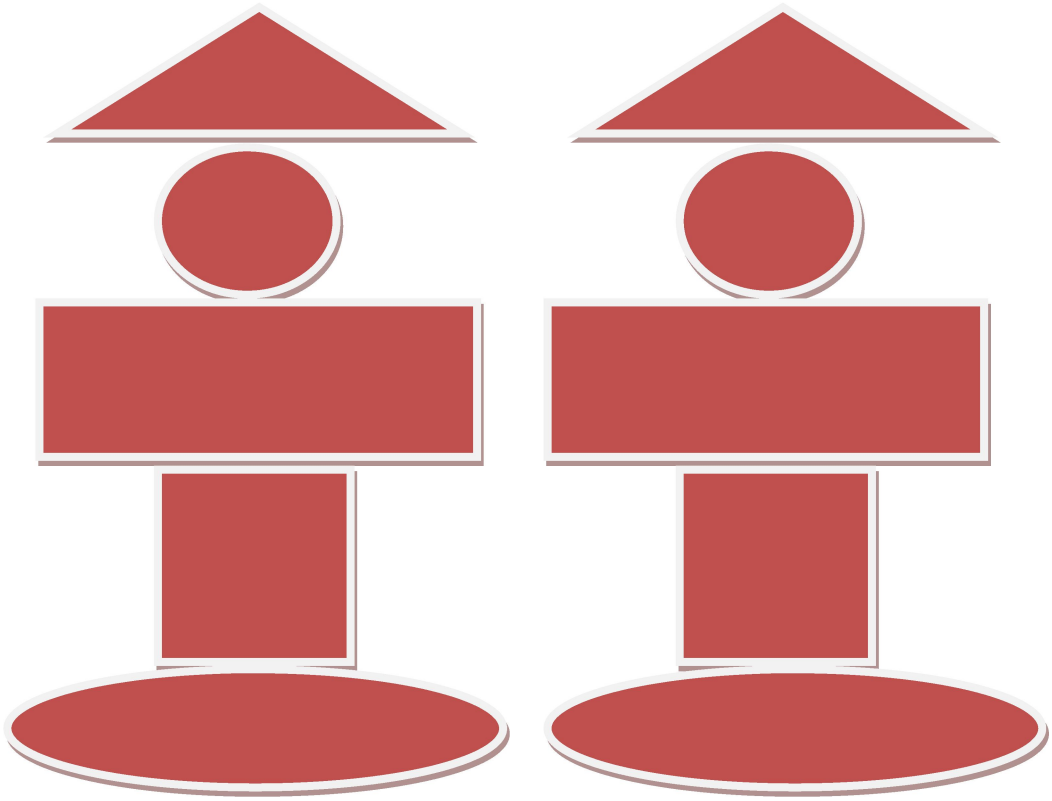
GEOMETRICALLY PROOF BY FOOTPRINTS

IN DIPAWALI, WE WORSHIP FOR THE GANESH JI AND LAXMI JI AND ALSO WE MAKE FOOTPRINTS OF LAXMI JI SO NOW WE DRAW THE FOOTPRINTS OF LAXMI JI WITH GEOMETRICAL FIGURES WHICH WILL BE VERY HELPFUL TO SOLVE THIS CONJECTURE



FOOTPRINTS OF LAXMI JI

Here FOOTPRINTS of LAXMI JI are constructed with Triangle, Circle, Rectangle, Square and Oval.

Here we can say behind these figures - triangle, Circle, Rectangle, Square and Oval are hidden Laxmi Ji Footprints.

Pattern – If any numbers, figures, shapes, letters are repeated in a definite sequence then it is called the pattern.

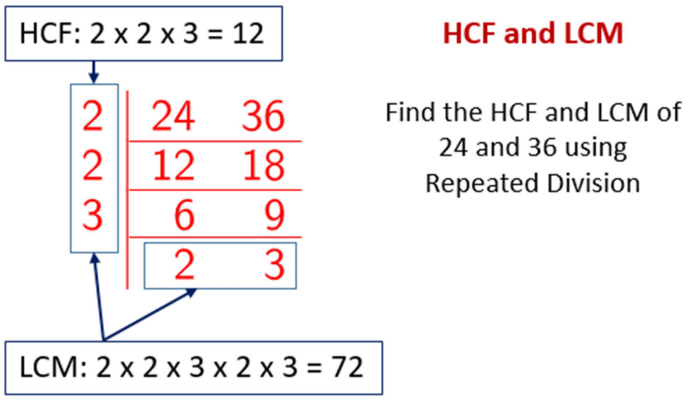
Examples are bricks in lane, the dart board has many colors and designs, Curtains, iron gills

Similarly, from these figures we can make Ice – cream by Triangle, Ball by Circle, carom by Square, Earth by Oval, and hut by Rectangle. We can draw beautiful scenery also by these figures.

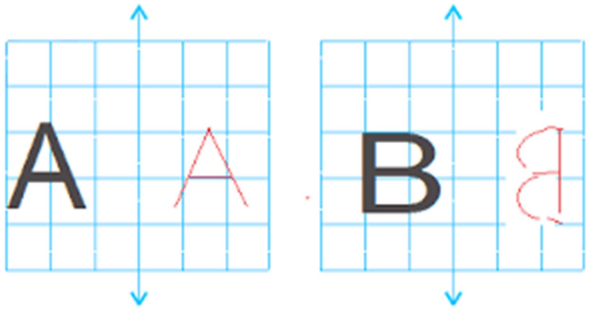
We can draw train also by these figures. Here we can say a big meaning hidden behind these small figures.

Similarly, Find the HCF of 24, 32 by division method.

Factors HCF and LCM comes in pairs.



Graph Gap – GAP will be same in GRAPHS also. (Just like Mirror Image)



Examples of graph image are capital letter A, B

A CURVED MIRROR

A curved mirror is a mirror with a curved reflecting surface. The surface may be either convex (bulging outward) or concave (recessed inward). Most curved mirrors have surfaces that are shaped like part of a sphere, but other shapes are sometimes used in optical devices. The most common non-spherical type are parabolic reflectors, found in optical devices such as reflecting telescopes that need to image distant objects, since spherical mirror systems, like spherical lenses, suffer from spherical aberration. Distorting mirrors are used for entertainment. They have convex and concave regions that produce deliberately distorted images. They also provide highly magnified or highly diminished (smaller) images when the object is placed at certain distances.

Ratios are comparisons between two numbers or quantities when one is divided by the other. For Example: The Ratio of Pythagoras Theorem 2:1, Best Example - Musician makes rhythm by 2:1.

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MIND BLOWING SECRET BEHIND THE NUMBERS 369

"REVERSE METHOD BEST EXAMPLE BY NIKOLA TESLA"

The Equi – angular Spiral: approximated by ¼ Circle "Spiral" growth by quadrants I. Patterns are everywhere in Golden Ratio in Sacred Geometry.

The binary number system the pre fix Bi stands for 2. The binary number system is a Base 2 number system. There are 2 symbols that represent quantities.

0, 1

Each place value in a binary number is a power of 2.

Nikola Tesla Inventor knows the magnificence of the three numbers 369. If you know the magnificence of the three, six and nine you would have a key to the universe. In vertex math there is a pattern repeat itself 1, 2, 3, 4, 5, 6, 7, 8, 9 in between 3, 6, 9 are the special number for free energy.

Let's start from 1, doubled it is 2, 1+1 =2, 2 doubled it is 4, 2+2 = 4, 4 doubled it is 8, 4+4 = 8, 8 doubled it is 16, 8+8 = 16, 16 doubled it is 32, 16+16 = 32, 7 doubled t is 14, 7+7 = 14, 1+4 = 5 , 32 doubled it is 64, 6+4 = 10, 1+0 =1 so, if we continue we keep following same pattern 1, 2, 4, 8, 7, 5 over and over. You could see there is no mention of 3, 6, 9. It is like there beyond of this pattern. Something is strange 3+3 doubled is 6 which 6+6 double is 12

Result 1+2 = 3, other pattern 12+12 = 24, 2+4=6, 24+24 = 48, 4+8 = 12, 1+2, 48+48=96, 9+6 = 15, 1+5 = 6, 96+96 = 192, 1+9+2 = 12, 1+2 = 3, 192+192=384, 3+8+4=15, 1+5=6, 384+384=768, 7+6+8 =21, 2+1=3, 9+9 = 18, 3+6=9, 18+18 = 36, 3+6=9, 36+36 = 72, 7+2 =9, 72+72=144, 1+4+4 = 9, 144+144 = 288, 2+8+8 = 18, 1+8=9

9 are called the symbol of enlightenment. As we can see and observe

I. A circle has 360 degrees. (3+6+0=9)
II. Semicircle has 180 degrees. (1+8+0=9)
III. One fourth of circle has 90 degrees. (9+0=9)
IV. 45 degree (4+5=9)
V. 22.5 degree. (2+2+5=9)
VI. 11.25 degree (1+1+2+5=9)

A pattern develops when bisecting a circle. Resulting angle always reduces to 9.

Now see sum of angles of regular polygons.

I. Triangle=180 degree (1+8+0=9)
II. Square= 360 degree (3+6+0=9)
III. Pentagon= 540 (5+4+0=9)
IV. Hexagon = 720 (7+2+0=9)
V. Heptagon=1080 (1+0+8+0=9)

VI. Octagon = 1260 (1+2+6+0=9)

and so on.....

By above duality of 9, we see that, 9 models "no “thing and "every “thing as bisecting a circle takes us to a singularity and our polygons communicate an outward divergence

Some More-

I. 1+2+3+4+5+6+7+8=36 (3+6=9)
II. 9+x will return x, where x is any digit (1 to 9)

Example- 9+7=16 (1+6=7)

So 9 literally equal all the digits (36) and nothing (0)

I. Also 6 is the least perfect number.
II. 3 is the least odd prime.
III. 3 and 6 are first two triangular numbers (after 1, which is conventionally triangular) and adding them gives 9.

Associativity of addition of numbers
To find sum of three numbers 14, 27 and 13, thus, (14+27)+13 = 14+(27+13). This can be done for any three numbers. This property is known as associativity of additional of numbers. Express the property in a general way, by using variables a, b and c.

(a+b) +c = a+(b+c)

IN SCIENCE

Quantum Entanglement – In typical gapped systems, ground state contains only short – range co – relations. In topological ordered systems, ground state contains long – range co – relations not accessible via standard observables such as co – relation functions of local operators, etc.

When 2 states are organic to have entanglement entropy, the causality and inverse casualty are some amount. So when causality are same amount, we can define the relation between 2 in organic. But something is conserved which were not seen something is conserved various effects were interchangeable Electrical Effect, Magnetic Effect, Mechanical effect conversion was somehow linked to conservation. Similar concept in thermodynamics – Properties that depend only on equilibrium state does not depend on path. For Examples – Pressure, temperature, Internal Energy, Entropy, Enthalpy, etc.

Thermodynamics – The science of relationship between heat, work, temperature, and energy

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DNA - Deoxyribonucleic acid is a molecule composed of two chains that coil around each other to form a double helix carrying genetic instructions for the development, functioning, growth and reproduction of all known organisms and many viruses.

System Engineering – A branch of engineering that uses knowledge from various other branches of engineering and science in the planning and development of more abstract systems such as work-flow or risk assessment.

In most general form, algebra is the study of mathematical symbols and the rules for manipulating these symbols and the rules for manipulating these symbols.

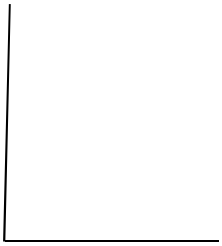
2*3+4-1

= 6+4-1

=9

Algebra – Idea of variable

Matchstick Pattern - Sita and Gita are making pattern with matchsticks. They decide to make simple patterns of the letters of the English alphabet. Sita takes two matchsticks and forms the letter L as shown in figure (i)

Fig. 

Then Gita also picks two sticks, forms another letter L and puts it next to the one made by Sita . Then Gita adds one more L and this goes on.

Their friend Durga comes in. She looks at the pattern. Durga always asks questions. She asks the girl, " How many matchsticks will be required to make seven Ls"? Sita and Gita are systematic. They go on forming the patterns with 1L, 2Ls, 3Ls, and so on and prepare a table

Number of Ls formed	1	2	3	4	5	6	7	8	…..
Required Matchsticks	2	4	6	8	10	12	14	16	…..

Durga gets the answer to his question from the table 7Ls require 14 matchsticks.

While writing the table, Sita realizes that the number of matchsticks required is twice the number of Ls formed.

Number of matchsticks required = 2 x number of Ls

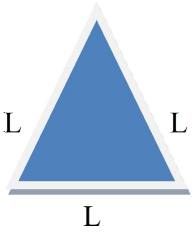
The rule was – Number of matchsticks required = 2n

Algebra is the method which simple the calculations.

For Example –

- ✓ A pattern of letter Z . Its formula will be 3n.
- ✓ The teacher distributes 5 pencils per students. Can you tell how many pencils are needed, given the number of students? (Use (s) for the number of students.)
  = 5s (formula will be 5s)
- ✓ The side of an equilateral triangle is shown by L.

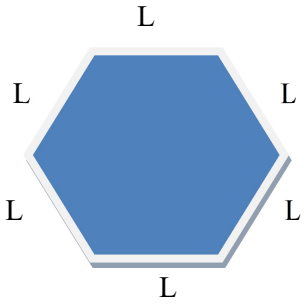
  Express the perimeter of the equilateral triangle using



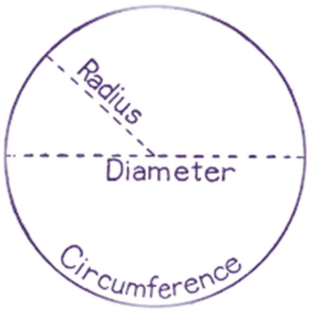
  P = 3 X side

  3L

- ✓ The sides of a regular hexagon is denoted by L. Express the perimeter of the hexagon using L



  P = 6Xside
  P = 6L
- ✓ The diameter of a circle is a line which joins two points on the circle and also passes through the Centre of the circle. In the adjoining figure AB is a diameter of the circle; C is the Centre). Express the diameter of the circle (d) in terms of its radius ®



d = 2r

Circle: - A circle is not a polygon as it is not made up of straight lines.

A circle is a simple closed curve. For Example – Watch

Parts of a circle – Recall the circle drawn with the string. The point where you pinned the thread is the centre of the circle. The length of the thread is the radius of the circle.

Thus, radius of the circle is the distance between its centre and any points on its boundary.

Concentric circles such as a dart bofat. Same centre known as concentric circle.

Tessellation – Tiling is just a way of covering a flat surface like a ceiling, wall or floor with smaller shapes or tiles that fit together nicely with a repeating pattern and without gaps or overlaps.

Tessellation comes from the word " tessera" in latin meaning a small stone cube. They were used to make up tesselleta" – the mosaic pictures forming floors and tilings in Roman Buildings

Example – A Brick Wall, Game of Chess.

Natural Tilings - The cross section of a behive is an example of tiling produced in Nature.

Geneating Set – The unit or tile that repeats itself to from the tilling pattern is called the generating set.

In a chess board, the tile that repeats itself is a square

In a behive, the tile that repeats itself is a hexagon.

In a brickwall, the repeating tile is a rectangle. Tiling Pattern with one shape. Hexagons

Convert into meters.

Round the nearest hundred – 685 Ans 700

324 Ans 300

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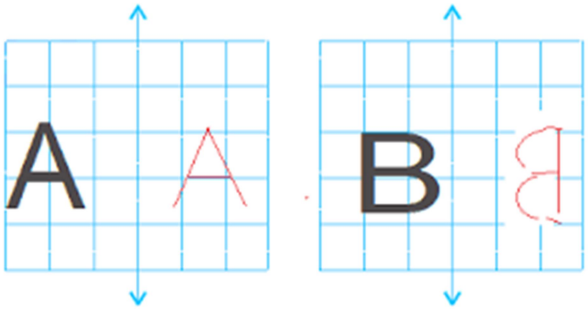
BRIDGE GAP BETWEEN TWO POINTS

In Our Mythological Books " Ramayan". We read about bridge called " Ram Setu" " Adam Bridge"

NASA finds traces of this bridge. This bridge joins India and Srilanka. "Srimad Bhagwad Gita" is the bridge between this world and god's world for us.

IN GEOMETRY - GAP will be same in GRAPHS (Just like Mirror Image)

Examples of graph image are capital letter A, B



WHAT IS EQUATION?

LHS = RHS

IMPORTANT THEOREM AND DEFINITIONS
PYTHAGORAS THEOREM – The Pythagoras Theorem says that HYPOTENUSE is a special relation between with the other two sides.

HYPOTENUSE = Longest side of triangle = opposite the right angle

Pythagoras Formula

a square + b square = c square

(H) square = (B) square + (P) square

Practical Geometry

Galois obtained necessary and sufficient conditions for an algebraic equation (in one variable) to be solvable by extraction of a chain of square roots. A beautiful application of this is to the problem of solvability of geometric problems by ruler and compass.

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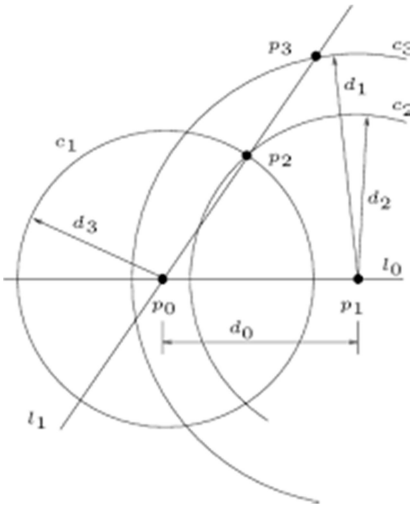


WE CAN UNDERSTAND THE RELATION BETWEEN RULER AND COMPASS BY

Q – Draw a circle of radius 3.2 cm.

Q – Let A & B be the centers of two circles of equal radii.

Q – Draw them so that each one them passes through the centre of the other.

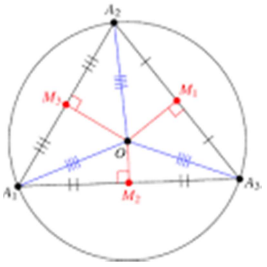
Q – Examine whether AB and CD are at right angles

Q – Draw any line segment PQ; without measuring it by ruler PQ, construct a copy of PQ.

A Greek mathematician Thales was the first person to give a proof of a statement that "A circle is bisected by its diameter"

PERPENDICULAR BISECTOR

Definition: A line which cuts a line segment into two equal parts at 90°. Try this Drag one of the orange dots at A or B and note the line AB always divides the segment PQ into two equal parts. When it is exactly at right angles to PQ it is called the perpendicular bisector. Perpendicular Bisector is like symmetry.



Symmetry – SYMMETRY

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When a shape can be folded so that one half would fit exactly over the other half along the fold line, the shape is said to be symmetrical. The fold line is called the axis of symmetry.

Mirror Image – A shape is also said to be symmetrical, when its one – half is placed in front of a mirror, you see the other half in the mirror.

Each half is called a mirror image of the other.

Reflectional Symmetry –

Is same in motivational way with big hidden meanings

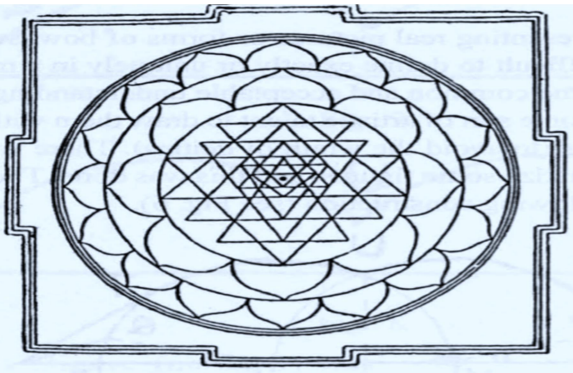

Fig. 3

Briefly stated, the *padma* of lotus figure [16] is a flowery design. Most commonly used figure of lotus has 8 petals which are symmetrically arranged usually in a circle. The outer part of a petal may be relatively longer or broader and is of three types, namely, (i) round, (ii) simply-pointed, (iii) inflectional or ogee-form. In Fig. 3, the triangular complex is surrounded by a lotus figure of 8 petals of inflectional type, i.e., each of the two sides of every petal has a point of inflexion where the curvature changes.

Each of the two sides of every petals has a point of inflection type where curvature change

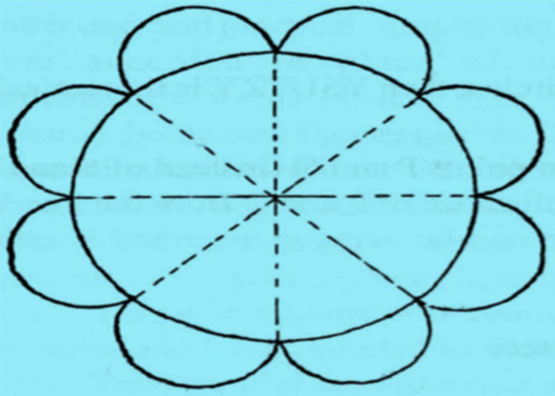

Fig. 4

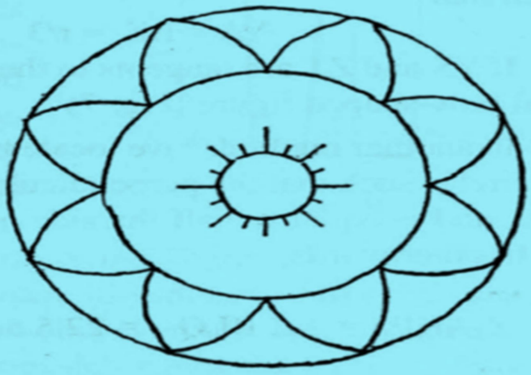

Fig. 5

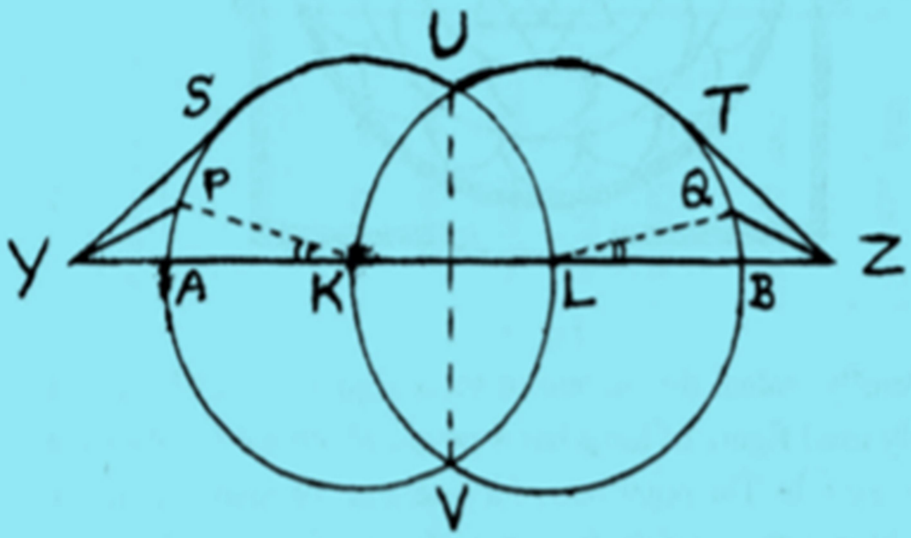

Fig. 6

Two equal intersecting circles are drawn such that the distance between their centers (K and L) is equal to the radius, r, of either circle. UV is their common chord. The line KL is extended both ways beyond the circles to become YZ such that

$$YA = BZ = r/3$$

If YS and ZT are tangents to the circles, then YSUTZY is theoretically an ideal bow-shaped figure (Fig. 7)[17]

In another method,[18] we locate two points P and Q (instead of S and T) on the circles such that the perpendicular distance of P and Q from the line YZ is same, and is equal to half the side of a regular octagon inscribed in either circle. In other words,

$$\angle AKP = \angle BLQ = 22.5 \text{ degrees}$$

By this method we get the bow-shaped figure YPUQZY (see Fig. 8).

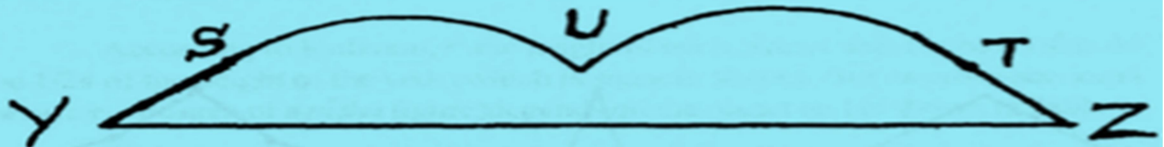

Fig. 7

Fig. 8

Even man's figure (*narākṛti*) was geometrized with the help of a circle (representing head) and 5 trapezia (representing other parts) for ritual purpose (see Fig. 9).

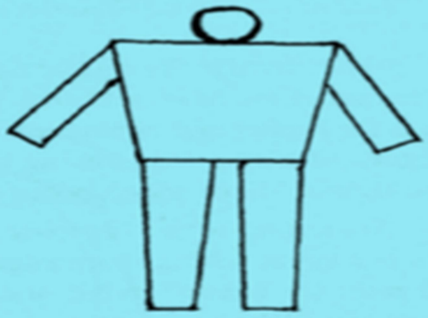

Fig. 9

There was effort in another direction as steps towards well-defined geometrical forms and some sort of standardization. It seems that to make the matter easy and practical, simpler figures were accepted in place of non-mathematical forms (snake, man, and *makara*). Some new figures (arrow, flag, *sīrpa* etc.) were incorporated. Some other changes were also made. The star-like *pañca-koṇa* (pentagram) was taken to represent the beautiful white shining star-*graha* Venus.[20]

This new allotment to Venus made its older symbol (viz. square) free for others and it was allotted to Moon. Some symbols were dropped !

Thus we find the following verses describing the *maṇḍala* figures of the *grahas* to be used for worship alternatively (*athavā*):[21]

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From the ancient world we can find out examples of some cultural achievements, which, at first sight, may appear to have used very high mathematical knowledge much above the capacities of the ancient culture. The investigations of such phenomenons may lead us to understand more deeply the significance of the world's scientific – and – technological progress. One of such unique objects is the Sri – Yantra (the Great or Supreme yantra) of Indian Tantric Tradition. The mathematical properties of the yantra is very complicated, and its interpretation is linked very deep cosmogonic and psychophysiological concepts. From Atharva Veda (12^{th} century B.C.) is dedicated to the Sriyantra – like figure composed of nine triangles.

The *Śrīyantra* consists of a central 14-angles seal (polygon), 8 and 16-petalled lotus and the square of defence with four doors on four sides of the world (*bhūpura*). The seal is composed by intersection of nine big triangles, and, as a result of that, 43 small triangles are produced (Fig. 1).

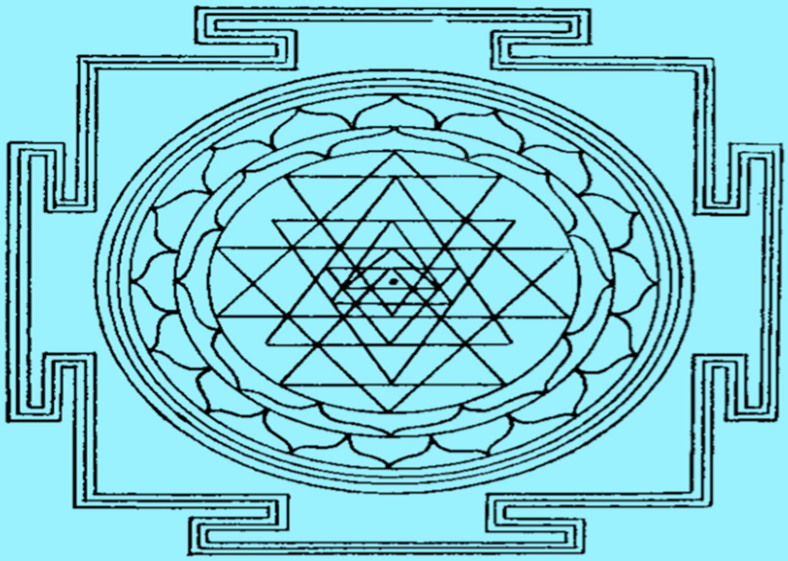

Fig. 1. The Śrīyantra

There are two ways of the contemplation of the Sriyantra: outward and inward, i.e. from the central point (bindu) outward to bhupura through the sequence of enclosing circles of the small triangles, petals of lotus and lines, and in opposite direction. These two methods are in use among the followers of "right – hand – path" and "left – hand – path" sects of tantra. The outward sequence of contemplation is associated with the evolutionary development of the universe from the primordial out – of – time and out – of – space state (unity of Siva and Sakti; the supreme consciousness and power, male and female principles) to phenomenal manifestation and to the more and more deep differentiation and complexity of matter. The inward sequence is associated with the process of destruction of the universe.

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ANALYSIS

Our attention in following the paper is directed only[4] to the geometrical structure of the *Śrīyantra* seal. The process of reproduction of the *Śrīyantra* is turned out to be unexpectedly a very difficult problem. Most of the seal's lines pass through 3-6 points of intersection of other lines, and a lot of redrawing of the whole figure is needed in order to attain precise super position of points. Let us try to understand the very nature of this problem.

The structure of *Śrīyantra* seal geometrically consists of four enclosed components (Fig 2). The process of construction of each component includes the drawing of closed sequence of lines, in conjunction of which, it is needed to draw a line from three points of intersection of previously drawn lines.

Let us try to understand this process by construction of the component *I*. (Fig. 2*a*). First of all let us choose *a priori* value *yA* (it will be corrected by construction of component 4) and draw the two largest and symmetrical triangles (thin lines). Then let us arbitrarily place point A′ at horizontal line, draw the line connecting the points 1, *A′* and then draw horizontal line from point 2. Now we have three points 3, *A′*, *D*, and we must draw line through points 3, *A′*, so as to meet the point *D*. In order to attain this goal, a sequence of approximations (the iterative process in mathematical sense) is necessary to perform. The construction of component 2 is almost in symmetry with component 1 (the value *yB* chosen *a priori* will be corrected by construction of component 3). When components 1, 2 are drawn, we have all lines needed to start the construction of component 3. After that the construction of component 4 may also be performed.

Therefore, the co-operation among four iterative procedures has three levels of enclosure (Fig. 3). At each step of approximation for third component it is needed to perform a full cycle of iterative steps for second component. And at each iterative step for fourth component the first three approximation processes must be completely fulfilled. Thus, if we designate the amount of iterative steps needed to attain determined precision of drawing for components 1-4, correspondingly, with letters *a*, *b*, *c*, *d*, then the painting of the *Śrīyantra* seal may be expressed by following formula:

$$N = ad + bcd + cd + d \qquad (1)$$

The foregoing iterative three-level-enclosed procedure may be the only possible technique if we desire to attain the increasing precision in the construction. On the other hand, in order to make a copy from the available seal, it is necessary and enough to know the values of four parameters, each of which determines the geometry of one structural component (for this purpose it is the best to pick up four abscissae of horizontal lines in the seal).

Let us now look into the general analytical aspect of the polygon. With the help of linear and circular equations and a sequence of super position (of co-ordinates) of the matching line points each structural component may be described by algebraic equation. Thus, in the simplest case for component 1 we have (check at Fig. 2*a*) following sequence of formulas for co-ordinates of points (we suppose that a radius of outer circumference=1):

$$yD = \frac{yA' - y^3}{yA'} \cdot xD + y^3,\ xD = \sqrt{1 - yD^2},\ y^3 = yA' - \frac{y1 - yA'}{x1 - xA'} \cdot xA'$$

$$x1 = \frac{1 - y^4}{y^4 + 1} \cdot x^4,\ x^4 = \sqrt{1 - y4^2},\ y^4 = y^3 = y1 = -yA' = yA.$$

The requirements for precision of construction is: $y2=yD$, which after super position of foregoing formulas and required analytical transformations comes to polynomial form:

$$P = yA^8 - 4yA^7 + 4yA^6 + 4yA^5 - 10yA^4 + 4yA^2 - 4yA + 1 - 4xA^2 + 8yA.xA'^2 - 20yA^2.xA'^2 + 20yA^4.xA'^2 - 8yA^5.xA^2 + 4yA^6.xA'^2 + 16yA'^2.xA'^4 = 0$$

The whole *Śrīyantra* seal may now be described by system of algebraic nonlinear equations from second to sixteenth power of variables:

$$\begin{aligned} &P_{8.4}(yA, xA') = 0 \\ &Q_{16.8.4}(yA, xA, yB) = 0 \\ &R_{16.4.6.8}(yA, xA, xA', yB) = 0 \\ &S_{8.3.2.4}(yA, xA, xA', yB) = 0 \end{aligned} \qquad (2)$$

Polynomials $A_{i,j,\ldots}(x, y, \ldots)$ are $i, j, \ldots$-power of variables $x, y, \ldots$ and consist from 16 to 512 members.

From the geometrical nature of the system 2, it may be presumed that there is, at least, one real solution (root), which may be calculated by some iterative method. Such root is:

$$\begin{aligned} yA &= 0{\cdot}279461220858 \\ xA &= 0{\cdot}259039898582 \\ xA' &= 0{\cdot}270779392707 \\ yB &= -0{\cdot}10141046595 \end{aligned} \qquad (3)$$

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The Moral Compass

A compass is a relatively simple instrument based on a simple concept. With its northward-facing needle, it is a consistent and a true indicator of physical direction. By placing *moral* in front of *compass*, we evoke a clear picture of mental processes that point a person in a particular direction in life. These processes are consistent and true indicators upon which personal belief and action can be based.

The concept of morality is also relatively simple at its absolute core. It denotes conduct or duties based on what is right and wrong. Morality is considered to be the basis of character and is wrapped around ethics.

But while both the concept of a moral compass and the definition of morality are simple and clear, the concept of what constitutes morality is not. One person's moral compass may not point in the same direction as another's, as far as right and wrong conduct and belief are concerned.

Let * be defined by a*b = a/b. Is * defined on the rational Q? If b = 0, we have an undefined output. How about on the positive rational as an output?

Behaviour of E depends on P corresponding of these analogs covered in Experiment named

LAWYER COME OUT FROM THE ROOM (Cryptographically Designed)

No problem a/b will always give exactly one positive rational as an output, similarly behavior of E depends on P

For Example: How Shiva Overcame Lust – Elaborate by Sadguru in his video.

L for lust, Lust means desire, L is also symbol of Roman number that is 50 and L is a sign of perpendicular lines.

Similarly, A single word has different other meanings

WHAT IS REALITY? WHY WE STILL DON'T UNDERSTAND THE WORLD'S TRUE NATURE?

A negative photographic image made on the book or specially prepared glass, from which positive prints may be made.

ANT = is a process where we can measure negative thinking and positive thinking.

Creative – Creative thoughts take wings in nature.

Short summary a lady lawyer searching job and suddenly she found a reference of a lawyer, she calls to fix her interview. When she walks into a room and she saw an advocate was sitting alone and no one in his office to help him, she decided to help him.

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Other side of the text

Once upon a time, in the middle of a large lake, on a beautiful solitary island, there was a cottage. In that cottage, a snake, having worshipped Lord Shiva was seated in the midst of the altar. At that time, a seeker who was a disciple of a great Master, came to the prayer room to worship Lord Siva.

A full experiment covered in novel "Lawyer come out from the room"

Have I not chanted each day – 'God Siva' is my father, Goddess Parvati my mother, God's devotees are my relatives and God's creation my home? Snakes love Lord Shiva and are therefore His devotees and therefore are also my relatives.

It is important to understand a few basic principles of Vedanta. "Veda" means to know or knowledge. Vedas are eternal truths that govern the universe. They are not composed or invented. They are not even discoveries but are revelations.

EXTERNAL PRACTICES – the spiritual practices required to make the mind pure, concentrated and subtle or equipped with the fourfold qualification of one's duties with the right attitude, cultivating values, performing rituals and so on.

It consist more than 100 statements. This hypothesis created in response of advocate.

NATURE'S BALANCE: OXYGEN

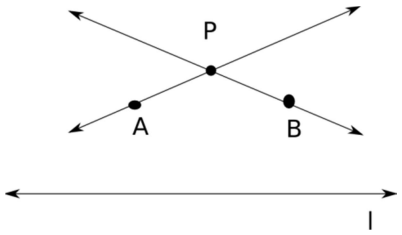
All living creatures breathe in Oxygen and give out Carbon dioxide in order to live. Plants take in carbon dioxide and release carbon dioxide. Plants make their own food. They absorb carbon dioxide in the air and water from the soil.

Leave contain Chlorophyll which uses sunlight as a source of energy to break down carbon dioxide and water into food. Oxygen is released during this breakdown. The process is known as Photosynthesis.

Will we ever run short of oxygen?

If deforestation continues at a rapid rate, and no more new trees are planted, it could lower the supply of oxygen.

Definition Of Intersecting Lines. Lines that have one and only one point in common are known as intersecting lines. A minimum of two lines is required for intersection. The common point where all the intersecting lines meet is called the Point of Intersection.



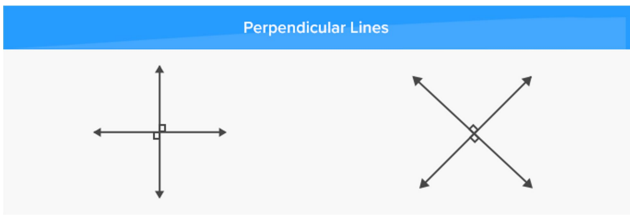
An example of the intersecting line or (line segment)

A crossing where two roads meet and cross each other.

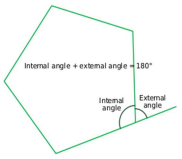
Perpendicular Lines –

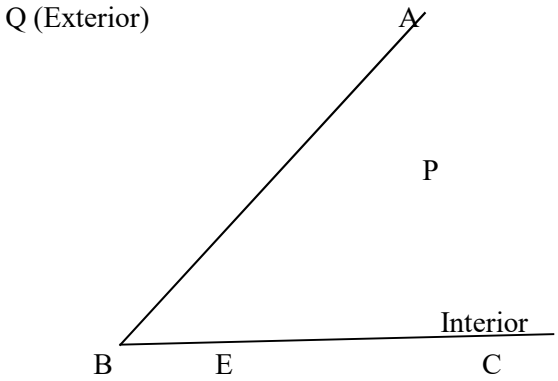
Perpendicular lines intersect at right angles,

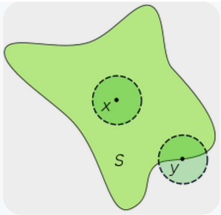
They stand tall, and never do they dangle.
The letter "L" is an example of perpendicular line segments



- Interior and Exterior of an angle - The sum of the internal angle and the external angle on the same vertex is 180°.
- The sum of all the internal angles of a simple polygon is 180(n–2)° where n is the number of sides. The formula can be proved using mathematical induction and starting with a triangle for which the angle sum is 180°, then replacing one side with two sides connected at a vertex, and so on.
- The sum of the external angles of any simple convex or non-convex polygon is 360°.
- The measure of the exterior angle at a vertex is unaffected by which side is extended: the two exterior angles that can be formed at a vertex by extending alternately one side or the other are vertical angles and thus are equal.







The point *x* is an interior point of *S*. The point *y* is on the boundary of *S*.

In mathematics, specifically in topology, the interior of a subset of a topological space is the union of all open subsets of that set. A point that is in the interior of *S* is an interior point of *S*.

The interior of *S* is the complement of the closure of the complement of *S*. In this sense interior and closure are dual notions.

The exterior of a set *S* is the complement of the closure of *S*; it consists of the points that are in neither the set nor its boundary. The interior, boundary, and exterior of a subset together partition the whole space into three blocks (or fewer when one or more of these is empty). The interior and exterior are always open while the boundary is always closed. Sets with empty interior have been called boundary sets

Definitions

Interior point

If *S* is a subset of a Euclidean space, then *x* is an interior point of *S* if there exists an open ball centered at *x* which is completely contained in *S*. (This is illustrated in the introductory section to this article.)

This definition generalizes to any subset *S* of a metric space *X* with metric *d*: *x* is an interior point of *S* if there exists $r > 0$, such that *y* is in *S* whenever the distance $d(x, y) < r$.

This definition generalizes to topological spaces by replacing "open ball" with "open set". Let *S* be a subset of a topological space *X*. Then *x* is an interior point of *S* if *x* is contained in an open subset of *X* which is completely contained in *S*. (Equivalently, *x* is an interior point of *S* if *S* is a neighborhood of *x*.)

Interior of a set

The interior of a set *S* is the set of all interior points of *S*. The interior of *S* is denoted int(*S*), Int(*S*) or S^{o}. The interior of a set has the following properties.

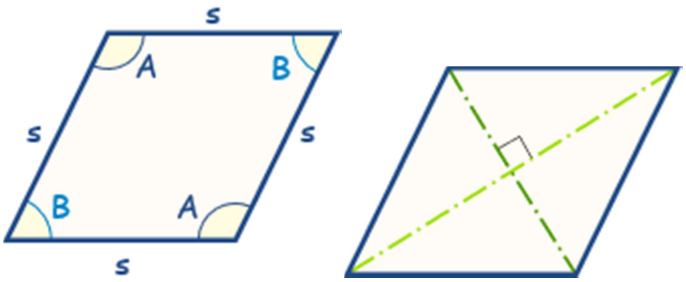
- int(*S*) is an open subset of *S*.
- int(*S*) is the union of all open sets contained in *S*.
- int(*S*) is the largest open set contained in *S*.
- A set *S* is open if and only if *S* = int(*S*).
- int(int(*S*)) = int(*S*) (idempotence).
- If *S* is a subset of *T*, then int(*S*) is a subset of int(*T*).
- If *A* is an open set, then *A* is a subset of *S* if and only if *A* is a subset of int(*S*).

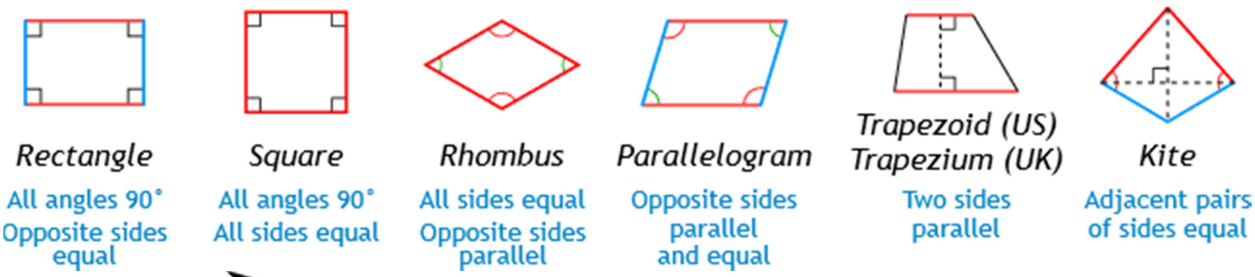
Sometimes the second or third property above is taken as the *definition* of the topological interior.

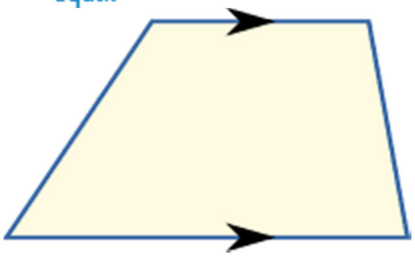
Note that these properties are also satisfied if "interior", "subset", "union", "contained in", "largest" and "open" are replaced by "closure", "superset", "intersection", "which contains", "smallest", and "closed", respectively.

A rhombus is a four-sided shape where all sides have equal length (marked "s"). Also opposite sides are parallel *and* opposite angles are equal. Another interesting thing is that the diagonals (dashed lines) meet in the middle at a right angle. In other words they "bisect" (cut in half) each other at right angles.

A rhombus is sometimes called a rhomb or a diamond.







The Trapezoid (UK: Trapezium)

Trapezoid	Isosceles Trapezoid

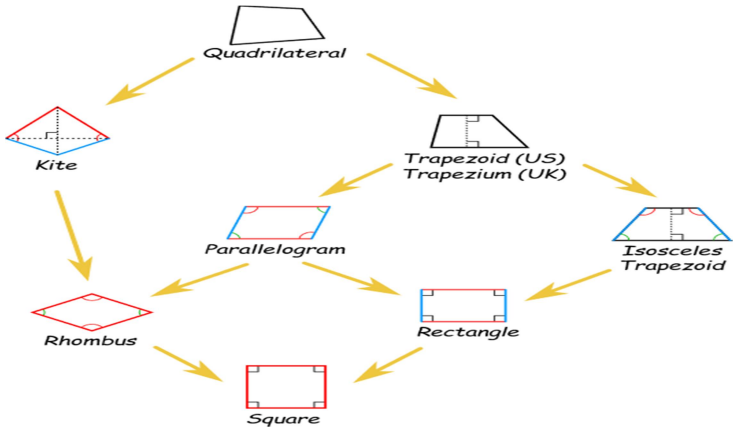
A trapezoid *(called a trapezium in the UK)* has a pair of opposite sides parallel.

And a trapezium *(called a trapezoid in the UK)* is a quadrilateral with NO parallel sides:

	Trapezoid	Trapezium
In the US:	a pair of parallel sides	NO parallel sides
In the UK:	NO parallel sides	a pair of parallel sides

It looks like a kite (usually). It has two pairs of sides:

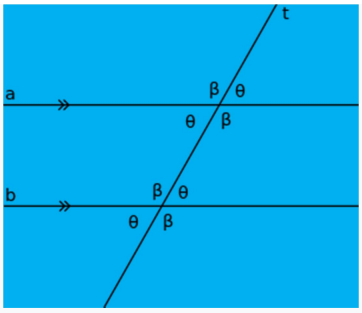
- Each pair is made of two equal-length sides that join u
- The angles where the two pairs meet are equal.
- The diagonals, shown as dashed lines above, meet at a right angle.
- One of the diagonal *bisects* (cuts equally in half) the other.



Euclidean parallelism

Two lines in a plane

Conditions for parallelism



As shown by the tick marks, lines *a* and *b* are parallel. This can be proved because the transversal *t* produces congruent corresponding angles, shown here both to the right of the transversal, one above and adjacent to line *a* and the other above and adjacent to line *b*.

Given parallel straight lines *l* and *m* in Euclidean space, the following properties are equivalent:

1. Every point on line *m* is located at exactly the same (minimum) distance from line *l* (*equidistant lines*).
2. Line *m* is in the same plane as line *l* but does not intersect *l* (recall that lines extend to infinity in either direction).
3. When lines *m* and *l* are both intersected by a third straight line (a transversal) in the same plane, the corresponding angles of intersection with the transversal are congruent.

Since these are equivalent properties, any one of them could be taken as the definition of parallel lines in Euclidean space, but the first and third properties involve measurement, and so, are "more complicated" than the second. Thus, the second property is the one usually chosen as the defining property of parallel lines in Euclidean geometry. The other properties are then the consequences of Euclid's Parallel Postulate. Another property that also involves measurement is that lines parallel to each other have the same gradient (slope).

COMPUTATIONALLY EXPLAINED AND PROVED HOW SMALL PIECES ARE FIT TOGETHER

COMPUTER SCIENCE

From slow beginnings, computers have developed the speed and complexity by which they process billions of pieces of information in a second and solve problems beyond practical human reach. The first computing device was simple – beginning with the abacus, a rectangular array of beads mounted on rods, used since at least 1100 B.C. for basic arithmetic.

During the Renaissance, innovators from Leonardo da Vinci o Gottfried Leibniz and Blaise Pascal designed or built machines that could add and subtract. (Leibniz's Step Reckoner even multiplied.) But the 1800s saw the first machines that could translate programmed instructions, store information, and branch through alternative processes depending on prior outcomes. Joseph – Marie Jacquard, a French Weaver, developed a loom that used punched cards to execute complicated designs. In the 1820s, Englishman Charles Babbage envisioned a steam – driven Analytical Engine that would store a thousand large numbers, decipher punch card instructions switch operations based on outcomes, and feed results to a printer.

Babbage's wonder was never built, but in the 1930s inventors like Howard Aiken and John Vincent Atanas off began using vacuum tubes and electronic circuits to build increasingly

powerful machines. They also experimented with expressing instructions in binary code, reducing information to 1s and 0s. That work culminated in the World War II – era development by Alan Turing of the Colossus, a code cracking machine. In 1946, the room size Electronic Numerical Integrator and Computer (ENIAC) became the first modern computer in operation. By 1964, integrated circuits helped move computers into the commercial world with IBM's first mainframe office computer. A decade later, microprocessors made machines faster and smaller.

The IBM – developed Blue Gene/L Computer at Lawrence Livermore National Laboratory in California can perform 478.2 trillion operations per second.

THE INTERNET

The network of networks that connects computers throughout the world has its origins in a problem that arose as the machines became more sophisticated in the 1950s: How can many users in a large organization share computational power? Programmers figured out how to break information into small packets that could be routed through different available circuits, and ever faster computers reassembled the packets more and more quickly.

As access expanded, so did ease of use. Swiss researcher Tim Berners- Lee developed hypertext transfer protocol (HTTP) in the early 1990's, which allowed various elements – graphics, imagery, and text – to be collected together into a "page" with links and references to other pages. Pages accessible through this growing World Wide Web were identified by a textual label, called a universal resource locator (URL). At the University of Illinois, Marc Andreessen developed Mosaic, the world's first Web "browser" – software by which computer users can view pages and navigate the Internet with the use of a computer mouse.

NAVIGATE THE INTERNET

When you enter a website address into your computer's Internet browser, the browser launches an exchange of information with computers around the world to identify the site's numerical IP address and connect to the computer hosting it. The information flows first to a "point of presence" computer maintained by an Internet service provider (ISP) – the company that connects your home or office to the Internet. From there, it travels to a broader NAP, where networks connect to each other and to the Internet's even larger trunk or backbone – fiber – optic lines.

Eventually the request reaches a group of computers called root servers and domain name servers; they function as the Internet's address book. Maintained by private companies and government agencies, the servers pass around the query until one of them identifies the location of the requested website and returns the information needed to connect to it and receive images and text from it.

Although the computers involved may be spread around the globe, the process typically takes only seconds to complete.

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A TYPICAL NETWORK CONNECTS BUSINESSES, HOMES, UNIVERSITIES, AND GOVERNMENT AGENCIES.

Powerful gateway computers operated by service providers connect different wide – area – networks. Satellites and home lines relay data and messages between computers. Routing computers along the way decode instructions on the transmissions that tell how and where to send the messages.

WWW Stands for "World Wide Web." It is important to know that this is not a synonym for the Internet. The World Wide Web, or just "the Web," as ordinary people call it, is a subset of the Internet. The Web consists of pages that can be accessed using a Web browser. The Internet is the actual network of networks where all the information resides. Things like Telnet, FTP, Internet gaming, Internet Relay Chat (IRC), and e-mail are all part of the Internet, but are not part of the World Wide Web. The Hyper-Text Transfer Protocol (HTTP) is the method used to transfer Web pages to your computer. With hypertext, a word or phrase can contain a link to another Web site. All Web pages are written in the hyper-text markup language (HTML), which works in conjunction with HTTP.

BIG DATA – You can carry massive amounts of computing power in your pocket in the form of a smart phone – something that would have been unimaginable in the 1940s.

CELL PHONES – Engineers at companies such as AT&T and Motorola had started developing telephone units that could be carried or mounted in a car. They also had come up with a system to hand off calls between cell towers, allowing users to remain in motion.

A decade after the first successful cell phone call was made in 1973 the Federal Communications Commission told Motorola it could start selling its Dyna TAC 8000 – the famous “brick” phone that weighed in at 28 ounces, about seven times the weight of a modern cell phone.

The popularity of smart phones is no surprise. They are phones, calculators, planners, Internet surfers, gaming systems, and global positioning systems all rolled into one. They are also portals into the user’s life. Every mapped road trip of WEB search has the capacity to be entered into a plethora of algorithms that companies have developed to tailor their services, sell advertising, and market content.

WEARABLE TECHNOLOGY – Advances in wearable tech now allow us to track the number of calories burned in a day via a wristband or feel an incoming call through vibrations in a piece of jewelry.

NANOTECHNOLGY – The pure gold in a wedding band creates a symbol of permanence and stability. But medieval artisans knew that mixing super – small amounts of glass with gold could create different colors and effects. Their work is considered a primitive application of nanotechnology – the art of manipulating matter a few atoms at a time. Nanotechnology works on an almost unimaginably small dimension, using the nanometer, a billionth of a meter, as a basic measurement.

3D PRINTING’s is greatest strength.

ROBOTICS: One of the first robots was built in the fifth century B.C. It was a mechanical bird that could be powered by either steam or compressed air. Researchers in Australia are building a microscopic robot that would move around in a manner similar to E. coli bacteria. The tiny machine could take biopsy from inside the human body.

LASER WORK, New trends of optics are good examples.

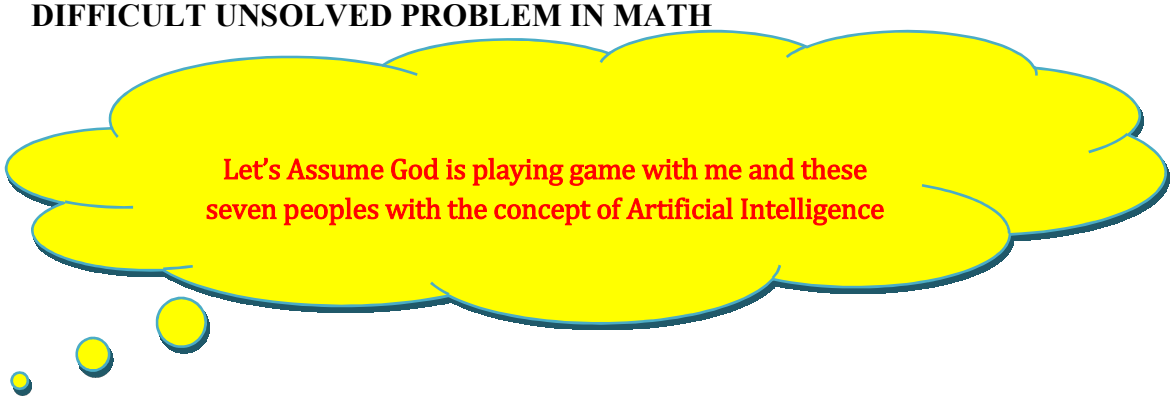
ROOTKIT VIRUSES

A rootkit virus is a type of malware that installs an unauthorized rootkit on an infected system, giving attackers full control of the system with the ability to fundamentally modify or disable functions and programs. Rootkit viruses were designed to bypass antivirus software, which typically scanned only applications and files. More recent versions of major antivirus and antimalware programs include rootkit scanning to identify and mitigate these types of viruses.

Viruses spread in many ways. One transmission pathway is through disease-bearing organisms known as vectors: for example, viruses are often transmitted from plant to plant by insects that feed on plant sap, such as aphids; and viruses in animals can be carried by blood-sucking insects. Influenza viruses are spread by coughing and sneezing. Norovirus and rotavirus, common causes of viral gastroenteritis, are transmitted by the faecal–oral route, passed by contact and entering the body in food or water. HIV is one of several viruses transmitted through sexual contact and by exposure to infected blood. The variety of host cells that a virus can infect is called its "host range". This can be narrow, meaning a virus is capable of infecting few species, or broad, meaning it is capable of infecting many.

Viral infections in animals provoke an immune response that usually eliminates the infecting virus. Immune responses can also be produced by vaccines, which confer an artificially acquired immunity to the specific viral infection. Some viruses, including those that cause AIDS and viral hepatitis, evade these immune responses and result in chronic infections. Several antiviral drugs have been developed.

ARTIFICIAL INTELLIGENCE'S ABILITY TO SHIFT THROUGH LARGE AMOUNTS OF DATA IS HELPING US TACKLE ONE OF THE MOST DIFFICULT UNSOLVED PROBLEM IN MATH



"A Light or Music in a New Life can be protected by Meditation and Prayer to reach the Star for Pride in King's Kingdom".

Pattern as a Role – Model - Provide one or more AI agents for the player to behave similarly to. For Example above pattern based on below given names

1. Swati Star
2. Guard Protect
3. Narinder King, King's Kingdom
4. Nabaneeta A NEW LIFE
5. Mala Meditation and Prayer
6. Gaurav Pride
7. Deepika - Light, Music

Explanation – Artificial Intelligence techniques to date often demonstrate strongly patterned behavior that players come to predict: e.g. finite state machines follow fixed routines that can often be easily noticed. Rather than attempt to make agent behavior more unpredictable, this pattern leverages the behavioral rigidity of a technique to set a stage for the player to act on.

Example: - Spy Party is a game where one player is a spy at a party populated by FSM agents and the opposing player is a sniper watching the party with a single shot to kill the spy.

PATTERN AS AI IS VISUALIZED

Let's take numbers KEY ID 74350905 from CICADA 3301.

1. Here 7 means reality is often hidden behind the illusions.
2. Here 4 means with the energies of four direction.
3. Here 3 means a heart romantically involved each other.
4. Here 5 means when temptation is strong one will cheat another.
5. Here 0 means in central role.
6. Here 9 means perfect movement of God.
7. Here 0 means same as above.
8. Here 5 means divine will in dynamic way.

Correct sequence of sentence will be –

A heart romantically involved with the energy of four directions but the reality is hidden behind the illusions, one will cheat another to accomplish divine will when temptation is strong in perfect movement of God in dynamic way. Provide a visual representation of the underlying AI state, making game play revolve around explicit manipulation of the AI state. Explanation – Many AI techniques revolve around an estimation of the value of actions or game states. Typically these values are hidden from players to promote the sense that an opposing AI agent possesses an intelligence motivating its actions. Visualizing

the state of a system or agent enables game play as the system is now exposed as a potential obstacle to player progress.

Example – Third Eye Crime is a stealth game that illustrates this pattern by visualizing the guard AI position tracking and estimation system. Game involves avoiding guards or throwing distractions to manipulate the guard's predictions of player location. The direct visualization of AI state allows a designer to build a game around manipulating, understanding, and mentally modeling how the AI state changes.

Pattern as AI is guided as a Characters "6EQUJ5", distinguishing them from all the other 1s and 2s on the field of data.

6 E Q U J 5

Message behind these characters will be -

A priest of very high rank transfer the electronic data for information exchange via the Internet. The hypothetical source of the passages shared by the gospels united in names an organization of people with a common purpose or interest, who meet regularly and take part in shared activities. Energy, equal to the work done by a force of one Newton when its point of application moves one meter in the direction of action of the force, equivalent to one 3600th of a watt-hour. A message from priest that huge changes are about to unfold in people's life. An elemental symbol within an agreed set of symbols, intended to represent a readable character for the purposes of writing.

Pattern: The player assists a simple or brittle AI agent that is threatened with self destruction.

Explanation: Many AI algorithms are brittle and likely to break unless constrained to highly limited environment rather than avoid exposing the AI to situations where its behavior would be detrimental, build game play around the player acting to avoid those situations. Game play then emphasizes players acting around the AI to protect it or directly acting to continually maintain the AI in the face of gradual degradation.

Example: The Sims addressed the problem of "human-like" agents in a social world by making game play revolve around the player addressing the needs of simple agents. By having players care for the AI, players come to at least indirectly.

Pattern as AI "Try to be an old angry man!" Facial expression recognition

Speaker,

"I exist" is logically true – 3814 – Exodus 3:14. Denoting the hypothetical source of the passages shared by the gospels of Matthew and Luke, but not found in mark. We should bring back people in describing card games and recording moves in a little internal rhyme from which people feels love and affection such as addressing their children and lovers addressing each other.

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Explanation: In games developed around players overcoming opposition the AI agents. AI being a character in the game world, it is an actor attempting to create an experience for the player while maintaining a façade of being a character.

Example: Alien: Isolation is a first-person survival horror game where the opposing alien was designated to harass the player without using an optimal strategy that would always kill the player directly.

CONCLUSION:

ABSOLUTE ZERO is a theoretical limit, i.e. does not exist in nature.

All gases are not ideal at all temperature.

So gases will be liquefy before reaching OK.

The Closest we have been able to reach yet to OK is 100 Pico Kelvin (0.000000000. 1 K)

Temperature near OK

"ORIGIN" – Most often that point or rotation will be the origin but it is important to understand that it does not always have to be at the origin. When rotating, it is also important to understand the direction that you will have to rotate. We can rotate either in the clockwise or counter wise direction. While we rotate we always focus on 90 degrees, 80 degrees, 180 degrees, 270 degrees, and 360 degrees angles.

TRANSFORMATIONS IN THE COORDINATE PLANE Transformations in the coordinate plane are often represented by "coordinate rules" of the form (x, y) --> (x', y'). This means a point whose coordinates are (x, y) gets mapped to another point whose coordinates are (x', y')

CO-ORDINATE GEOMETRY It is that branch of geometry which defines the position of a point in a plane by a pair of algebraic numbers. It is also called Algebraic Geometry or Analytical Geometry.

Why do we Need Coordinate Geometry?

Coordinate geometry has various applications in real life. Some of the areas where coordinate geometry is an integral part include.

1. In digital devices like computers, mobile phones, etc. to locate the position of cursor or finger.
2. In aviation to determine the position and location of airplanes accurately.
3. In maps and in navigation (GPS).
4. To map geographical locations using latitudes and longitudes.

Understanding the Concept of Coordinates

- The point of intersection of the x and the y-axis is known as the origin. At this point, both x and y are 0.

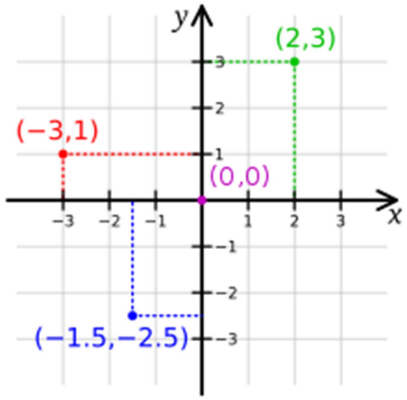
- The values on the right-hand side of the x-axis are positive and the values on the left-hand side of the x-axis are negative.
- Similarly, on the y-axis, the values located above the origin are positive and the values located below the origin are negative.
- When you have to locate a point on the plane, it is determined by a set of two numbers. So, first, you have to write about its location on the x-axis followed by its location on the y-axis. Together, the two will determine a single and unique position on the plane.

RECTANGULAR AXES AND ORIGIN Let X′OX and Y′OY be two perpendicular straight lines intersecting at the point O. Then

(i)X ′OX is called the axis of x or the x-axis.

(ii)Y ′OY is called the axis of y or the y-axis.

(iii) Both X′OX and Y′OY taken together, in this very order, are called the rectangular axes or the axes of co-ordinates or the co-ordinate axes or simply the axes. They are called rectangular axes because the angle between them is a right angle.



Their point of intersection O is called the origin.

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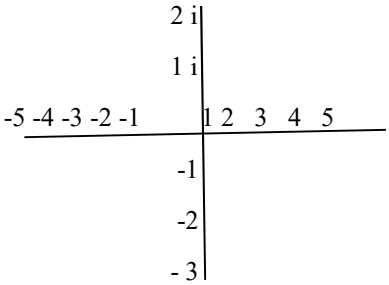
IMAGINARY NUMBERS FUNCTIONS OF COMPLEX VARIABLES

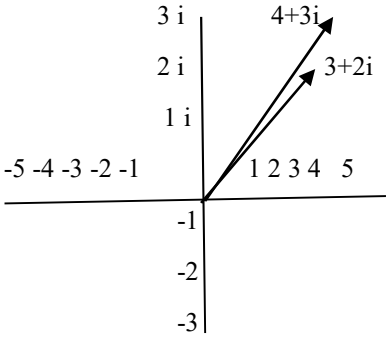
Many concepts in fundamental Physics and engineering depend on the existence of what we called imaginary numbers. Imaginary numbers are used in Schrodinger Equations.

The only numbers that we can physically see and touch are positive real numbers, but there also exists another very useful set of numbers called negative real numbers.

In addition to positive and negative numbers, there exists yet another set of mysterious numbers which are just as real, even though we have chosen not to refer to them as real. Instead, we have decided to refer to these numbers as imaginary, and we can represent by two new number lines. A number can appear anywhere along any of these four number lines



A number can also appear anywhere in the plane formed by these number lines, in which case the number is the sum of a real number and an imaginary number. The set of all the numbers that can appear in this plane are what we refer to as “complex numbers.”



We can represented each complex number as 3 + 2i , 4+3i and so on when two complex numbers are added together, their arrows add together like vectors to produce the result. When two complex numbers are added together, their arrows add together like vectors to produce the result.

4 + 3 + (3+2) i means their real portions add together and their imaginary portions add together. A complex number can be represented by its real component and its imaginary component. Or, the complex number can instead be represented by the length and the angle of arrow makes with the positive real axis, in the counterclockwise direction.

We can assume 2< 30 degree 4 < 45 degree

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Suppose we have two complex numbers, by these two arrows, and we multiply them together. Their product will be represented by a new arrow. The length of the new arrow is the product of the length of the two original arrows. And the angle of this new arrow is the sum of the angles of the two original arrows.

2*4 , (30 degree + 45 degree) Suppose that we have number that is represented by an arrow with a length of one, and an angle of 90 degree. We will refer to this number as "i "if we multiply "I" by itself, the product will be represented by an arrow. We can have a length of 1 multiplied by 1. And it will have an angle of 0 degrees + 90 degrees. Therefore, the new arrow will have a length of one, and an angle of 180 degrees. This number is negative 1. Therefore, "i" multiplied by "i" is exactly equal to negative one. We can represented by saying that i square = -1

Or we can represent by square root 1 = i

If we have a function with only real numbers as inputs and outputs, then we can represent it with one axis for the input, and one axis for the output. If we have a function with complex numbers as inputs then we need two axes just to represent the input.

We need one axis to represent the real number of the input, and the other axis to represent the imaginary part of the input. The output of the function is also a complex number which would need two additional axes to be represented. The output of the function is a complex number with a length and an angle.

We can call length of the arrow the "magnitude" of the output. And we can call the angle of the arrow the "phase" of the output. But, since we already have two axes for the input, and we are limited to only a total of three spital dimensions, we can represent the output with just a single axis.

New Axis will only signify the "magnitude" of the output, using a logarithmic scale. The phase of the output will be signified by the color. F (s) = s. This will be graph for the function where the output is exactly equal to the input. The magnitude of this function at the center of the graph will be zero.

When the magnitude of this function is zero, it is represented on a logarithmic scale by the center of a bottomless funnel, due to the fact that zero on a logarithmic scale is represented by a number that approaches negative infinity on the axis.

We can consider other function F)s) = 1/s here, the magnitude of the function at the center of the graph approaches positive infinity, due to the fact that we are trying to divide by a number that approaches zero at the center of the graph.

Also, the colors depicting the angle of the complex function are now the mirror image of what they were before. This is because when we divide by a complex number, its angle is subtracted from the angle of the result.

F(s) = 100 s/s square +4

This function has two places where the magnitude of the output approaches infinity, and one place where the magnitude of the output approaches zero. The one place where the output approaches zero is the one place where the function's numerator approaches zero. The two places where the denominator approaches zero are the two places where the output approaches infinity.

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F(s) = 100s/s square + K s + 4

K is a constant. If we change the value of this constant, we can change the locations where the magnitude of the function approaches infinity.

We can call the places where the magnitude becomes infinity the “poles” of the function. We can call the place where the magnitude becomes zero the “zero” of the function.

F(s) e to power s

s = A+Bi

= e to the power A=Bi

The exponential of a complex number

If the imaginary part of the complex number is zero, then this formula becomes a simple exponential, and an exponential function plotted on a logarithmic scale looks like a straight line. On the other hand, if the real part of the complex number is zero, then we get result where the magnitude of the function is always exactly equal to one, and it is only the phase of the output that changes.

As it turns out “e” raise to the power of “complex number” = 1 < sin has the following formula

e raise to the power of A + Bi = e raise to the power A * e raise to the power Bi

= a raise to the power A * 1 < B

If A = 0, then e raise to the power A = 1

A complex number can be written as follows e raise to the power i sin = 1 < sin

= cos + i sin

F (s) = e raise to the power of s

By rearranging the terms cos (s)

= e raise to the power i and s + e raise to the power of – i and s divided by 2 and using the property of trigonometry we can get the following formula

Cos (s) = “e” raise to the power of i and s + “e” raise to the power of - i and s divided by 2 of an imaginary number

And we can get the following formula

Sin (s) = “e” raise to the power of i and s – “e” raise to the power of - i and s divided by 2 of an imaginary number

The sin and co sin always have a magnitude to less than or equal to 1.

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ROTATION OF THE EARTH

All spinning objects have an imaginary line called an axis, on which they spin.

We know about top. When we spin at top, it seems as though a line is running through the center of the top. However, when the top stops spinning, the line vanishes. The earth too has an axis which passes through the North and South Poles. The earth also spins around its axis. North Pole and South Pole are imaginary axis. The axis of the top is vertical but the axis of the earth is slightly tilted. It is at an angle of 23.5 degrees. The spinning of the earth around its axis is called rotation. The rotation of the earth always takes place in the same direction, from west to east. The earth takes 24 hours to spin around its axis once. Let's assume if we throw light of torch on ball. The side of the ball facing the torch receives light while the opposite side remains dark.

Similarly, while the earth rotates around its axis, only half of its surface faces the sun. The portion that faces the sun receives light and experiences day and the portion in darkness experiences night. The day and night form like this. If the earth did not rotate, the areas experiencing day and night would be permanently fixed.

Do you know what the circle that divides the day from night on the globe is called? It is called the circle of illumination.

When the sun is overhead at any point on the earth's surface the time at that place is 12 noon. As the earth moves from west to east, the dark half gradually faces the sun. This movement produces dawn and dusk, the periods of diffused light between day and night.

The part of the day just before the sun rises in the east is called dawn.

The part of the day when the sun sets in the west and there is still some light is called dusk.

When we are in a moving train, the objects outside such as the trees and buildings seem to be moving in the opposite direction. However, in reality, they are still, while the train moves.

As the earth moves from west to east, the dark half gradually faces the sun. This movement produces dawn and dusk, the periods of diffused light between day and night. Japan is the dawn city of the world.

REVOLUTION OF THE EARTH

The earth moves around the sun in a fixed elliptical path. The path is called its orbit. The earth moves in its orbit at a speed of 30 kilometers per second.

All planets also move around the sun in fixed orbits. Each planet has a different orbit so that they don't bump into each other.

The movement of the earth around the sun is called revolution.

The spinning of the earth on its axis is called rotation while the movement of the earth around the sun is called revolution. The earth takes 365 days, 6 hours and 8 minutes (approximately 365 ¼ days), to complete one revolution around the sun. The remaining ¼ days are added to the year after every four years. The year with 365 days is called a leap year. Leap year always in February.

The earth's axis is always inclined in the same direction at an angle of 23.5 degrees to the vertical. This inclination of the earth's axis together with the earth's revolution around the sun causes seasons.

The equator divides the earth into two halves known as hemisphere. Thus, we can observe position, the northern hemisphere is hotter and experience summer. Meanwhile, the southern hemisphere experiences winter. The sun's rays fall directly on the southern hemisphere while they fall on the northern hemisphere in a slanting manner.

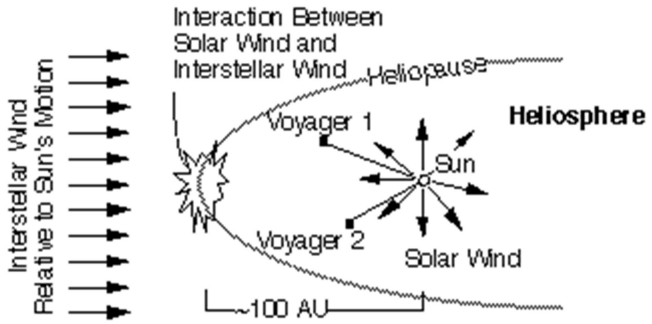
'Equi' means the equal and 'nox' means night. Equinox is the time when all places on the earth have equal duration of day and night.

'Sol' means the sun. Solistics means the standing still of the sun. Solistice is either of the two times of the year at which the sun reaches its highest or lowest point in the sky at midday.

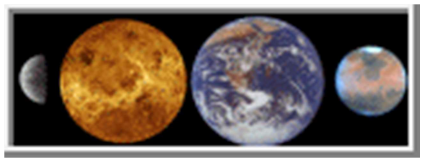
HOW CLOSE TO SOMETHING FROM ZERO

Composition of The Solar System: The Sun contains 99.85% of all the matter in the Solar System. The planets, which condensed out of the same disk of material that formed the Sun, contain only 0.135% of the mass of the solar system. Jupiter contains more than twice the matter of all the other planets combined. Satellites of the planets, comets, asteroids, meteoroids, and the interplanetary medium constitute the remaining 0.015%. The following table is a list of the mass distribution within our Solar System. Sun: 99.85% , Planets: 0.135% , Comets: 0.01% ? , Satellites: 0.00005% , Minor Planets: 0.0000002% , Meteoroids: 0.0000001% , Interplanetary Medium: 0.0000001%

Interplanetary Space - Nearly all the solar system by volume appears to be an empty void. Far from being nothingness, this vacuum of "space" comprises the interplanetary medium. It includes various forms of energy and at least two material components: interplanetary dust and interplanetary gas. Interplanetary dust consists of microscopic solid particles. Interplanetary gas is a tenuous flow of gas and charged particles, mostly protons and electrons -- plasma -- which stream from the Sun, called the solar wind.

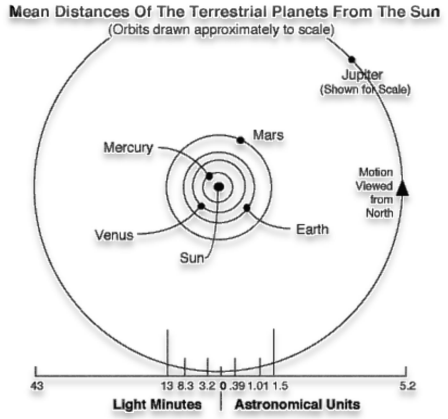


The solar wind can be measured by spacecraft, and it has a large effect on comet tails. It also has a measurable effect on the motion of spacecraft. The speed of the solar wind is about 400 kilometers (250 miles) per second in the vicinity of Earth's orbit. The point at which the solar wind meets the interstellar medium, which is the "solar" wind from other stars, is called the heliopause. It is a boundary theorized to be roughly circular or teardrop-shaped, marking the edge of the Sun's influence perhaps 100 AU from the Sun. The space within the boundary of the heliopause, containing the Sun and solar system, is referred to as the heliosphere. The solar magnetic field extends outward into interplanetary space; it can be measured on Earth and by spacecraft. The solar magnetic field is the dominating magnetic field throughout the interplanetary regions of the solar system, except in the immediate environment of planets which have their own magnetic fields.



The Terrestrial Planets

The terrestrial planets are the four innermost planets in the solar system, Mercury, Venus, Earth and Mars. They are called terrestrial because they have a compact, rocky surface like the Earth's. The planets, Venus, Earth, and Mars have significant atmospheres while Mercury has almost none. The following diagram shows the approximate distance of the terrestrial planets to the Sun.



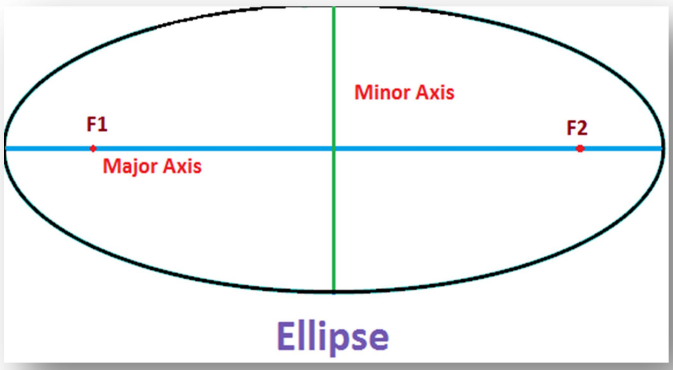
The Sun is a star. It contains 99.9% of the Solar System's mass.[2] This means that it has strong gravity. The other objects are pulled into orbit around the Sun. The Sun is mostly made out of hydrogen, and some helium.

There are eight planets in the Solar System. From closest to farthest from the Sun, they are: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune. The first four planets are called terrestrial planets. They are mostly made of rock and metal, and they are mostly solid. The last four planets are called gas giants. This is because they are much larger than other planets and are mostly made of gas.

The Solar System also contains other things. There are asteroids, mostly between Mars and Jupiter. Further out than Neptune, there is the Kuiper belt and the scattered disc. These areas have dwarf planets, including Pluto. There are thousands of very small objects in these areas. There are also comets, centaurs, and there is interplanetary dust.

Six of the planets and three of the dwarf planets are orbited by moons. Furthermore, planetary dust orbits the gas giants. Many other systems like the Solar System have been found. Each of the billions of stars in the Milky Way galaxy might have a planetary system.

An ellipse is a curve on a plane such that the sum of the distances to its two focal points is always a constant quantity from any chosen point on that curve. The ellipse belongs to the family of circles with both the focal points at the same location. In an ellipse, if you make the minor and major axis of the same length with both foci F1 and F2 at the center then it results in a circle.



Application of Ellipses:

They have widespread applications in the field of engineering, physics, etc. For instance, all the planets revolve in their orbits which are elliptical in shape. Moreover, astronomy has a lot of use of this shape as many of the stars and planets is shaped as ellipsoids.

The *plane of the ecliptic* is defined by the Earth's orbit around the Sun. All of the planets orbit the Sun roughly around this same orbital plane. The farther away from this plane a planet orbits, the more *inclined* is its orbit to the ecliptic. If you could look at the solar system "edge on" then all the planets would be orbiting more or less in the plane of the ecliptic.

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The Solar System has an elliptical or egg shape, and is part of a galaxy known as the Milky Way. The inner Solar System consists of the Sun, Mercury, Venus, Earth and Mars. The planets of the outer Solar System are Jupiter, Saturn, Uranus, Neptune and Pluto.

The sun is by far the largest object in our solar system, containing 99.8 percent of the solar system's mass. It sheds most of the heat and light that makes life possible on Earth and possibly elsewhere. Planets orbit the sun in oval-shaped paths called ellipses, with the sun slightly off-center of each ellipse.

Our solar system consists of an average star we call the Sun, the planets Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune, and Pluto. It includes: the satellites of the planets; numerous comets, asteroids, and meteoroids; and the interplanetary medium. The Sun is the richest source of electromagnetic energy (mostly in the form of heat and light) in the solar system. The Sun's nearest known stellar neighbor is a red dwarf star called Proxima Centauri, at a distance of 4.3 light years away. The whole solar system, together with the local stars visible on a clear night, orbits the center of our home galaxy, a spiral disk of 200 billion stars we call the Milky Way. The Milky Way has two small galaxies orbiting it nearby, which are visible from the southern hemisphere. They are called the Large Magellanic Cloud and the Small Magellanic Cloud. The nearest large galaxy is the Andromeda Galaxy. It is a spiral galaxy like the Milky Way but is 4 times as massive and is 2 million light years away. Our galaxy, one of billions of galaxies known, is traveling through intergalactic space.

The planets, most of the satellites of the planets and the asteroids revolve around the Sun in the same direction, in nearly circular orbits. When looking down from above the Sun's north pole, the planets orbit in a counter-clockwise direction. The planets orbit the Sun in or near the same plane, called the *ecliptic*. Pluto is a special case in that its orbit is the most highly inclined (18 degrees) and the most highly elliptical of all the planets. Because of this, for part of its orbit, Pluto is closer to the Sun than is Neptune. The axis of rotation for most of the planets is nearly perpendicular to the ecliptic. The exceptions are Uranus and Pluto, which are tipped on their sides.

Pythagoras Theorem – In a right triangle, the square of the hypotenuse is equal to the sum of the squares of the other two sides.

The Pythagoras Theorem says that Hypotenuse is a special relation between with the other two side. It tells us (HYPOTENUSE) square = sum of squares of other two sides.

Hypotenuse = Longest side of triangle = Opposite the right angle.

We can say c square = a square + b square

Algebraic geometry is a branch of mathematics, classically studying zeros of multivariate polynomials. Modern algebraic geometry is based on the use of abstract algebraic techniques, mainly from commutative algebra, for solving geometrical problems about these sets of zeros.

The fundamental objects of study in algebraic geometry are algebraic varieties, which are geometric manifestations of solutions of systems of polynomial equations. Examples of the most studied classes of algebraic varieties are: plane algebraic curves, which include lines, circles, parabolas, ellipses, hyperbolas, cubic curves like elliptic curves, and quartic curves like lemniscates and Cassini ovals. A

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point of the plane belongs to an algebraic curve if its coordinates satisfy a given polynomial equation. Basic questions involve the study of the points of special interest like the singular points, the inflection points and the points at infinity. More advanced questions involve the topology of the curve and relations between the curves given by different equations.

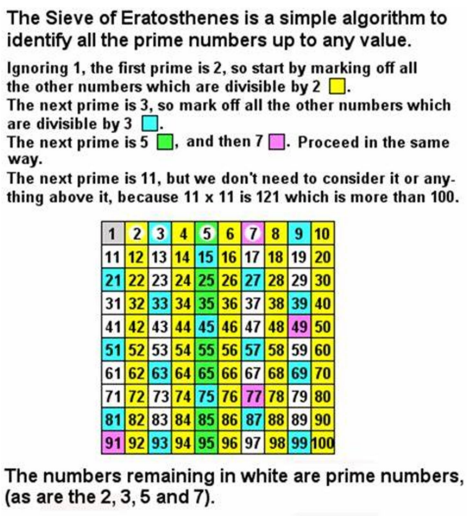
Algebraic geometry occupies a central place in modern mathematics and has multiple conceptual connections with such diverse fields as complex analysis, topology and number theory. Initially a study of systems of polynomial equations in several variables, the subject of algebraic geometry starts where equation solving leaves off, and it becomes even more important to understand the intrinsic properties of the totality of solutions of a system of equations, than to find a specific solution; this leads into some of the deepest areas in all of mathematics, both conceptually and in terms of technique.

In the 20th century, algebraic geometry split into several subareas.

- The mainstream of algebraic geometry is devoted to the study of the complex points of the algebraic varieties and more generally to the points with coordinates in an algebraically closed field.
- Real algebraic geometry is the study of the real points of an algebraic variety.
- Diophantine geometry and, more generally, arithmetic geometry is the study of the points of an algebraic variety with coordinates in fields that are not algebraically closed and occur in algebraic number theory, such as the field of rational numbers, number fields, finite fields, function fields, and *p*-adic fields.
- A large part of singularity theory is devoted to the singularities of algebraic varieties.
- Computational algebraic geometry is an area that has emerged at the intersection of algebraic geometry and computer algebra, with the rise of computers. It consists mainly of algorithm design and software development for the study of properties of explicitly given algebraic varieties.

Much of the development of the mainstream of algebraic geometry in the 20th century occurred within an abstract algebraic framework, with increasing emphasis being placed on "intrinsic" properties of algebraic varieties not dependent on any particular way of embedding the variety in an ambient coordinate space; this parallels developments in topology, differential and complex geometry. One key achievement of this abstract algebraic geometry is Grothendieck's scheme theory which allows one to use sheaf theory to study algebraic varieties in a way which is very similar to its use in the study of differential and analytic manifolds. This is obtained by extending the notion of point: In classical algebraic geometry, a point of an affine variety may be identified, through Hilbert's Nullstellensatz, with a maximal ideal of the coordinate ring, while the points of the corresponding affine scheme are all prime ideals of this ring. This means that a point of such a scheme may be either a usual point or a subvariety. This approach also enables a unification of the language and the tools of classical algebraic geometry, mainly concerned with complex points, and of algebraic number theory. Wiles' proof of the longstanding conjecture called Fermat's last theorem is an example of the power of this approach.

Sieve of Eratosthenes – About 250 BCE, a Greek mathematician, Eratosthenes, developed a method to find the prime numbers up to 100. This method is called Sieve of Eratosthenes because factors are used to sift out chaff from wheat. Finally, only the numbers which are not multiples of any numbers remain in the list



Successor – The number 1 more than a given number is called its successor.

There is no symbol for zero in the Roman System.

The Hindu – Arabic numeration system uses 10 digits 0, 1, 2, 3, 4, 5, 6, 7, 8, and 9 to write any other numeral. The romans had seven basic symbols to write any number. These seven symbols are I, V, X, L, C, D and M

I	V	X	L	C	D	M
1	5	10	50	100	500	1000

UNLIKE FRACTIONS

Fractions having different denominators are called unlike fractions. ½ and 2/5 are unlike fractions.

Similarly, 1/5, ¼, 1/11 and 1/23 are all unlike fractions.

Subtraction – Subtraction is the opposite of addition. Subtraction is used to reduce, remove, take away, compare, etc.

SUBTRACTIONS OF LIKE FRACTIONS

8/18 – 5/18 = 8-5/18 = 3/18 and then 3 divided by 3 and 18 divided by 3 result will be = 1/6

The Schrodinger Equation plays the role of Newton's Laws and conservation of energy in classical mechanics – i.e. it predicts the future behavior of a dynamic system. It is a wave equation in terms of the wave function which predicts analytically and precisely the probability of events or outcome. The kinetic and potential energies are transformed into the Hamiltonian which acts upon the wave function to generate the evolution of the wave function in time and space. The Schrodinger equation gives the

quantized energies of the system and gives the form of the wave function so that other properties may be calculated.

Work is ordered motion – Energy transferred by stimulating particles with coherent and ordered motion. Heat is disordered motion. Temperature is a measure of average kinetic energy. We can easily produce " Boiling Point and " Melting Point" When temperature increases, average distance between atoms increases like a photographic enlargement.

The three dimensional information is determined by the structure of the human skull and by the shape and texture of the overlying skin and tissue. The reflectance function at any given point on the surface is simply measure of how efficiently the skin at that point reflects light of various wavelengths. The information that reaches one's eye from the stimulus is, therefore, a complicated function of the three – dimensional structure of the facial surface, the reflectance function of the face at each point, and the illumination and viewpoint conditions. Despite the complicated nature of the information in faces and the complexity of the tasks required to achieve some constancy in representing this information, human observers are remarkably good at recognizing and categorizing faces. A temperature of every person change in linear dimension but the expansions of gases are different.

In physics (specifically, celestial mechanics), escape velocity is the minimum speed needed for a free, non-propelled object to escape from the gravitational influence of a massive body, that is, to achieve an infinite distance from it. Escape velocity is a function of the mass of the object and distance to the center of mass of the object. A rocket, continuously accelerated by its exhaust, need not reach ballistic escape velocity at any distance since it is supplied with additional kinetic energy by the expulsion of its reaction mass.

NOW WE SHALL SOLVE FROM THE SUPREME STANDPOINT

GANESH MANTRA

By all means, chanting of any Mantra of Ganesh is considered very auspicious and divine. In Hindu culture, Lord Ganesha is worshiped at the beginning of every auspicious – religious work and new venture.

We can easily find picture of Lord Ganesha on "Marriage Cards"

Shree Vakratunda Mahakaya Suryakoti Samaprabha;

Nirvighnam Kuru Me Deva Sarva-Kaaryeshu Sarvada ॥

Meaning

O Lord! with a curved trunk and a mighty body, whose lustre equals that of a millions suns.

I pray to thee O Lord; remove the obstacles from all the actions I perform.

I saw people never chant his mantra for health issues but surprisingly, while chanting of Ganesh Mantra, chanter's blood circulation and nervous system get direct healing by his mantras.

The meaning of this mantra is sufficient to solve this conjecture and forthcoming conjecture both.

OM BHU BURVAH SVA TATSAVITURENYAM BHARGODEVASYA ।

DHIMAHI DHIYO YO NAH PRACHODYAT ॥

God tells us by this shloka, "I exist as a awarer of three levels of field"

Bhu – same as the Earth

Bhuvah – same as the sky and

Svaha – same as heaven

In Hinduism, Shivling is a symbol that represents Lord Shiva. As the most powerful diety, temples are built in his honor, including a Shiva Ling, which represents all the energies in the world and beyond. There is no origin or form that can be associated with Shiva. Humans need a symbol to worship, so the ling was created "Ling means symbol"

Ling = Symbol

For Example, if someone used a stethoscope, it could identify that person as a doctor. A ling is just a symbol to identify something. This symbol we call Shivling has a specific explanation.

The truth behind the scientific discovery performed by Scientist Neils Bohr indicates that the molecules are made up of atoms that consist of protons, neutrons and, electrons, which play a vital role in

composition of Shiv Ling. In Ancient time, instead of using Proton, Neutron, Electron, and Energy, sages used such as Shakti, Lingam, Lord Shiva, Lord Vishnu, etc., since Sanskrit was the primary language in those periods.

IN BHAGWAD GITA, The Lord starts His teaching from the highest standpoint through the Path of Enquiry – Jnana Yog.

Atha paramartham, jnana yogam vakshyami, dvaitat bhayam jayate, servam khalvidam brahma, atmaiva idam sarvam, brahmaiva"
' tma, neha nanasti kincana, advayo ' ham ananto' ham saccidanando' ham iti jnatva abhaye pratitisthasi, avidyaya jagaj – jatam nasti satyam ihanvapi, asaj – jagatah bhayam api asadeva "ll

The Path of knowledge – Fear is born from the senses of duality. Indeed everything is the Reality alone. All is the self alone. The Reality is the Self. There is not the least bit of difference or duality. "I am the non – dual, infinite, Existence – Consciousness – Bliss." Knowing thus, remain established in fearlessness. The entire world is born of ignorance and there is not an iota of truth to it. The fear born from an illusory world is itself illusory.

Lord speaks of how to remove fear by following the path of knowledge, meditation and devotion.

Duality causes fear.

How far is God from me or how close is God to me? Even if one says that He is the closest, one admits to a distance, however small. Only when one says, 'He is me', that all possibility of fear, even of God goes. The scriptures say that the infinite Truth alone exists. There cannot be two infinities. Or even infinity + 1.

The Lord says that if you see the world, then its experience is only relatively real, not absolutely so. It is an appearance is only created due to ignorance of our infinite nature. An ignorance created illusory world, cannot cause real fear. Our fear too is born of ignorance and equally illusory.

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