BHASKARACHARYA

Born: 1114 in Vijayapura, India

Died: 1185 in Ujjain, India

Bhaskara, also known as Bhaskara II or Bhaskaracharya has been called the greatest mathematician of medieval India. The word Bhaskara means the teacher. He was born in a village of Mysore district India and lived between 1114-1185. He became a mathematician and astronomer and his works represent a significant contribution to the mathematical and astronomical knowledge in the 12th Century. He was born into a family belonging to Deshastha Brahmin Community. His father Maheshvara was an astrologer, who taught him mathematics, which he later passed on to his son Loksamudra. Loksamudra's.son helped to set up a school in 1207 for the study of Bhaskara's writings.

Bhaskaracharya served as head of astronomical observatory at Ujjain where Brahmgupta had served in a similar capacity some five hundred years ago. In many ways Bhaskaracharya represents the peak of mathematical knowledge in the 12 Century. Bhaskaracharya himself has written about his birth, his place of residence, his teacher and his education, in Siddhantashromani as "A place called "Vijjadveed', which is surrounded by Sahyadri ranges, where there are scholars of three Vedas, where all branches of knowledge are studied, and where all kinds of noble people reside, a Brahmin called Maheshwar was staying, who was born in shandilyaGotra, well versed in Shroud (originated from 'Shut' or 'Vedas') and "Smart" (originated from "Smut"). Dharma, respected by all and who was authority in all branches of knowledge, I acquired knowledge at his feet."

CONTRIBUTION

Bhaskara wrote the books 'SiddhantaSiromani', 'Lilavati' an 'Bijaganita". ColedayThe first book mainly deals with astronomy and other were on mathematics. SiddhantaSiromani' was written in the year 1150 and consists of two parts are Goladhyaya (sphere) and Grahaganita (mathematics of the planets). This book also deals with many other concepts like Trignometry and Calculus. Lilavati (meaning beautiful) is based on mathematics. It is believed that Bhaskara named this book after his daughter Lilavati. Many of the problems in this book are addressed to his daughter! The book contains 13 chapters, mainly definitions, arithmetical terms, interest computation, arithmetical and geometric progressions. His other books are KaranakuthubalaVasanabhasya of Mitaksara and Vivarana.

He was the first to give that any number divided by 0 gives infinity. He has written a lot about zero, surds, permutations and combinations, common commercial rules, interest, series, mensuration etc.

He wrote, "The hundredth part of the circumference of a circle seems to be straight. Our earth is a big sphere and that's why it appears to be flat. The rules relating to zero are also given by him e.g. a +0 a

Power of 0 are 0 a.0-0

He gave the formulae like sin (A+B)= sin A cos B+ cos A sin B

He presented a complete and systematic explanation of the Indian method of solving determinate and indeterminate problems on various topics including sale and purchase, interest, gems, gold and the measures of grains. Bhaskara can also be called the founder of differential calculus. He gave an example of what is now called "differential coefficient" and the basic idea ofwhat is now called "Rolle's Theorem".

●He also contributed much in the field of mensuration. He gave many important formulae for the computation of the area and volumes of different figures e.g. Area of sphere = 4 Area of circle

Volume of sphere = area of sphere of its diameter X

He also gave a proof of Pythagoras theorem. He gave a method of deducing new sets of solutions of

$X^2+B= y^2.c$

Where B and C are non-square integers. In the Surya Siddhant he makes a note on the force of gravity: "Objects fall on earth due to a force of attraction by the earth. Therefore, the earth, planets, constellations, moon and sun are held in orbit due to this attraction."

Bhaskaracharya was the first to discover gravity, 500 years before sir Isaac Newton. He was the champion among mathematicians of ancient and medieval India. Bhaskara is known for his poetic presentation of the complicated and abstract

Problems of mathematics e.g. A snake's hole is at the foot of a pillar and a peacock

Is perched upon its summit. Seeing a snake at a distance thrice the pillar's height

Gliding to his hole, he pounced obliquely upon him. Say quickly at how many cubits

From the snake's hole do they meet, both proceeding an equal distance? In this way what has been contributed by Bhaskaracharya is unaccountable. In every sense he was a celebrated astronomer and mathematician. He is like the crest on a peacock. In a journal of Royal Society, Dr. Stopwood has remarked, "We must acknowledge the intimate capabilities of Bhaskaracharya."

ARYABHATTA

Born: 476 AD Died: 550 AD

Aryabhatta, also known as Aryabhatta I or Aryabhatta (476-550 AD), is a famous Indian mathematician and astronomer, born in a place called Taregana, in Bihar. Taregana which literally means songs of starts in Bihari, is a small place situated nearly 30 km from Patna which was then known as Kusumpura later Pataliputra, the capital of Gupta Empire. This Empire has been dubbed as golden period of Indian history." According to Bhaskara 1, "Aryabhatta is the master who, after reaching the furthest shores and plumbing the innermost depths of the sea of ultimate knowledge of mathematics, Kinematics and spherics, handed over the three sciences to the learned world." He went to Kusumapura for advanced studies and lived there for some time. Hindu, Buddhist as well as Bhaskara I identified Kusumapura as Patliputra (modern patna). It is belived that Aryabhatta was the head of an Institution (Kulapati) at Kusumpura and because the university of Nalanda was in Pataliputra at the time and had an astronomical observatory, it is speculated that Aryabhatta might have been the head of the Nalanda University. Aryabhatta is also reputed to have set up an observatory at the Sun Temple is Taregana, Bihar.

CONTRIBUTIONS

Aryabhatta is the author of several treatises on mathematics and astronomy. He has written 4 books on mathematics.

1. Aryabhatiya-which is contribution of astronomical tables.

2. Aryastasata – which is a note on numeration in arithmetic

3. Kalakriya-which is a note on time and its measurement 4. Gola-which is a note on sphere.

He was the first to deduce that earth is spherical and rotates on its own axis, creating day and night. He declared that moon is dark and shines only because of sunlight. Solar and lunar eclipses occurred because of the shadows cast by the earth and the moon.

He also gave accurate calculations for the circumference of the earth (with in 0.2% of the actual value) and for the length of a day (with in 0.01 second of the actual value) and of a year (within 4 minutes of the correct value).

He gave the formula $(a+b)^2=a+b^2+2ab$ He taught the method of solving these problems:

1+2+3+4+5++] = (+1) 2

1+2+37 1+2+32 +²n(n+1)(2n+1) ……+n²

1+2+3+ (a+1)(2a+1)(3n+3-1) 30

Aryabhatta was also known as the master of astronomy. He for the first time boldly declared, “Diurnal motion of the heavens is due to the rotation of the earth about an axis.” He worked on the approximation of “Pi” () to 4 decimal places i.e. x = 3.1416 (App.) and defined it as irrational. He wrote that if 4 is added to 100 and then multiplied by 8 then added to 62,000 then divided by 20,000 the answer will be equal to the circumference of a circle of diameter twenty thousand. This calculates to 3.1416 close to x. But his greatest donation has to be zero, known “SHUNYA” in his times. ((4+100) x 8+ 62000)/20000-62832/20000 =3.1416. This implies the ratio of circumference of diameter is.

He put more appropriate uses of decimal system. The place value system, first seen in the 3rd century Bakshali Manuscript, was clearly in place in his work. While he did not use a Symbol for zero. That knowledge of zero was implicit in Aryabhata’s place value. System as a place holder for powers of ten with null coefficients.

In algebra, Aryabhatta found a method to solve equations such as 2x-3y=1 that were known at the time to be important in astronomy and would later also be important in cryptography. Such equations are

called first order linear diophantine equations. The method he found is known as the Kuttaka method or Aryabhatta's algorithm and is currently still the best known way to solve these equations.

He was Interested in practical geometry. He gave the formulae for calculating

Area of square, rectangle, triangle, rhombus, circle and volumes of sphere and cone. He tried to solve indeterminate linear equations like ax + by = c by the method

Of continued fractions. He explained the famous Pythagoras theorem as: "The square of the Bhuja put the square of the Koti is the squre of the Karna." The Bhuja and Koti are the sides of right angled triangle. The karna is the hypotenuese. As another examples we may take the following theorem:

Ax b = c^2

Where c is the half chord. (The Saras or arrows are the segments of a diameter which bisects any chord). He tried to give a rule for summing an arithmetic series after pth term

C8 (1) S=a[2-(2-1+P)4] e.g.

(ii) S=(a+1)" 2

A

Tex

[Where a and are the first and last terms of progression, d is the common difference between terms and n be the number of terms extending the (P + 1)th to the (P + n)th terms In an arithmetical progression. He was the first mathematician to give what later came on to be called the 'table of sines". If we use Aryabhatta's table and calculate the value of sin(30) Teaching of Mathematics

Which is 1719/3488-0.5, the value is correct.

Aryabhatta was the first to realise that sine and cosine functions would be useful in solving problems in trignometry. The main reason Aryabhatta was interested in trignometry was because it was related to Astronomy. This extraordinary man was an intellect of immense proportions and continues

To baffle many mathematicians of today. His working was then later adopted by Greeks and the Arabs. His contribution in mathematics is unparalleled. India's first satellite, launched in 1975, was called Aryabhatta and there is a crater on the moon named after him. Aryabhatta was also one of the themes of the 2006 RSA conference, a major annual meeting about cryptography and internet

Security. "Ramanujan's brief life and death are symbolic of condition in India of due millions how few get any education at all; how many live on the verge of starvation."

-Jawaharlal Nehru in his Discovery of India

SRINIVASA RAMANUJAN

Born: Dec. 22, 1987, Erode Died: April 26, 1920, Kumbakonam, Tamil Nadu

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SrinivasaRamanujan, one of India's greatest mathematical geniuses, was born in his grandmother's house in Erode, a small village about 400 km southwest of Madras on 22 Dec, 1887. His father, K. SrinivasaLyengar, worked as a clerk in a sari shop and hailed from the district of Thanjavur. His mother, Komalatammal, was a housewife and also sang at a local temple. After one year he was brought to his father's town Kumbakonam. He passed his primary examination in 1897, scoring first in the district and then he joined the Town High School. In 1904 he entered Kumbakonam's Govt. College as F.A. student. He was awarded a scholarship. However after school, Ramanujan's total concentration was focused on mathematics. The result was that his formal education did not continue for long. He first failed in Kumbakonam's Govt. College. He tried once again in Madras from Pachaiyappa's college but he failed again. It was at this time that he came across the book 'Synopsis of Elementary Results in Pure Mathematics' by GS. Carr. This book had a profound effect on Ramanujan. That's why he failed because he obsessed with mathematics, spending almost all of his time and energy on mathematics and ignoring other subjects.

SrinivasaRamanujan, the wonderful young Indian mathematician of the 20 Century asked his teacher in primary school, “Is zero divided by zero also unity?”, when his teacher tried to generalize that any number divided by itself was untiy. As a student of class III of a primary school he successfully worked out the properties Contribution of Mathematicians

Of Arithmetical, Geometrical and Harmonic progression and upto class IV he almost solve all the problems of Lony’sTrignometry meant for degree classes. He was so bright that he was declared ‘Child Mathematician’ at the age of 12 by his teachers. He used to entertain his friends with theorems and formulae with the recitation of complete list of Sanskrit roots and with repeating the value of x and square root of two to any number of decimal places. Ramanujan, on the strength of his good school work, was given a scholarship in 1904 but was not renewed because he devoted more and more of his time to mathematics and neglected his other subjects.

Continuing his mathematical work Ramanujan studied continued fractions and divergent series in 1908. He became seriously ill and underwent an operation in April 1909 after which it took him some considerable time to recover. He married on 14th July 1909 when his mother arranged for him to marry a ten year old girl Janaki. Ramanujan did not live with his wife, however, until, she was twelve years old.

In the course of his search for work, he was got introduced to a true lover of mathematics, DiwanBahadur R. Ramachandra Rao. For some months he was supported by Sri Rama Chandra Rao. Then he accepted his appointment as a clerk in the office of Madras Port Trust. While working as a clerk he never slackened his interest in mathematics. He made his one of the works published in the Journal of Indian Mathematical Society in 1911 at the age of 23. He wrote a long article on properties of Bernoulli’s numbers. Meanwhile he began correspondence with professor GH. Hardy, a leading mathematician of his time. To his first letter he attached 120 theorems of his own creation. Hardy made efforts to bring Ramanujan to Cambridge and helped him to learn modern mathematics. In 1916 he got honorary B.A. degree of the University of Cambridge.

In the spring of 1917, Ramanujan first appeared to be unwell. He went to Nursing home at Cambridge in the early summer and was never out of bed for any length of time again. For a brief period he resumed some active work, stimulated perhaps by his election to the Royal Society and Trinity fellowship. In 1918, he became the first Indian to be elected a fellow of the Royal society. He continued to suffer from poor health and returned to India in 1919. On April 26, 1920 he died due to Tuberculosis in the town of Kumbakonam in Tamil Nadu. He was only thirty-two years old.

CONTRIBUTIONS

●Ramanujan gave his contributions to the analytical theory of numbers, elliptic functions, continued fractions, infinite series and summed geometric and arithmetic series.

He discovered an incredible number of beautiful and original formulae in the field of number theory. He was well known as a self-taught mathematical genius from South India. He investigated the series (1/n) and calculated Euler's constant to 15 decimal places. Teaching of Mathematics

46 He worked on hypogeometric series and investigated relations between integrals and series.

. Ramanujan continued to develop his mathematical ideas and began to pose problems and solve problems in the Journal of Indian Mathematical Society. He worked out the Riemann series, the elliptic integrals, hypergeometric series and functional equations of the zeta function. In the other hand he had only a vague idea of what constitutes a mathematical proof. Despite many brilliant results, some of his theorems on prime numbers were completely wrong.

He Independently discovered results of Gauss, Kummer, hyper-geometric series.

. He also worked on partial sums and products of hyper-geometric series. In a joint paper with Hardy, Ramanujan gave an asymptotic formula for p(n). This was later proved by RademacherRamanujan. He discovered a number of remarkable identities that imply divisibility properties

Of the partition function.

He worked on divergent series. He sent 120 theorems on divergent series to Hardy in 1913. He gave a meaning to Eulerian Second Integral for all values of n (negative, positive and fractional). He proved that the integral of xe" = y (gamma) is

True for all values of gamma. ●Goldbach's conjecture is one of the important illustrations of Ramanujan's contribution towards the proof of the conjecture. The statement is every even integer greater than two is the sum of two primes, that is, numbers having no divisions. Ramanujan and his associates had shown that every large integer can be written as the sum of at most four primes (e.g. 43=2+5+17+19).

Ramanujan studied composite numbers, their structure, distribution and special

Forms.

He worked on Fermat theorem which states that a prime number of the form

4m+1 is the sum of two squares. Ramanujan had an amazing gift when it came to numbers. Once when Hardy visited Ramanujan while he was sick in hospital, he mentioned that the taxi he had just taken had an unremarkable number i.e. 1729. Ramanujan immediately replied that it was infact a very interesting number. So, 1729 is a famous Ramanujan number. It is the smallest number which can be expressed as the sum of two cubes in two different ways.

i.e. 1729-1'+12=9' +10'

He also produced a number of results in definite integrals in the form of general

Formulae.

Besides his published work, Ramanujan left behind several notebooks filled with theorems that mathematicians have continued to study. The English mathematician G.N. Watson, from 1918 to 1951, published 14 papers under the Contribution of Mathematicians

General title theorems stated by Ramanujan and in all he published nearly 30 papers which were inspired by Ramanujan's work. In 1997 the Ramanujan journal was launched to publish work "in areas of mathematics influenced by Ramanujan."

"The laws of nature are but the mathematical thoughts of God."

-Euclid

EUCLID

Born: App. 330 BC Died: App. 260 BC

Title-

Euclid (300 BC) has the distinction of being the only man to summarise all the mathematical knowledge of his times. Beyond the fact that he taught at Alexandria, we know nothing with certainty about Euclid himself. It is possible that he may have been an Egyptian and not a Greek. He systematised Greek mathematics that was existed at the time. It is certain that Euclid taught mathematics about 300 BC in the Royal School at Alexandria in Egypt that had been founded by king Ptolemy the successor of Alexander, the Great. His own education was probably acquired in Plato's academy at Athens. He learnt the geometry of Eudoxus and Thealtetus of which he was familiar.

His book elements, the world's most authoritative text on Geometry has made Euclid the father of Geometry. This mathematic treatise has been the centre of mathematics for 200 years. This has been used for centuries in Western Europe as Geometry Textbook. Alongwith 'Element' he wrote several books during his teaching profession for about 30 years. Once Ptolemy asked Euclid if there were any shorter way to study Geometry than through the 13 books of the Elements, and Euclid replied that there was no royal road to geometry. The book 'Elements' is the greatest text book of all times. It was translated to various languages. His 'Elements' began with construction problems and the reader learned that a figure could be drawn with his instruments before he studied its properties. According to Alfred Hooper Euclid collected all the geometrical facts known in his days, arranged the various theorems in proper order, improved their proofs where necessary and added theorems he himself had thought out. He presented earlier mathematician's work in a single, logically coherent framework, making it easy to use and reference in a beautiful way in elements.

The elements Is divided into 13 books which cover plane Geometry, arithmetic and number theory, irrational numbers and solid geometry. Euclid organized the known geometrical ideas, starting with simple definitions, axioms, formed statements called theorems, and set forth methods for logical proofs. He began with accepted mathematical truths, axioms and postulates and demonstrated logically 467 prepositions in plane and solid geometry. Euclid used an approach called the "synthetic

Approach" to present his theorems. Using this method, one progresses in a series of logical steps from the known to unknown. The elements was translated into Latin, Arabic and English and is divided into 13

Books. Books I-VI, deal with plane geometry, Books VII-IX, contain elements of

Number theory, Books XI-XIII examine three dimensional figures in Greek stereometria Book-1 proves Elementary theorems about triangles and parallelograms

2

Book-II

And ends with Pythagorean theorem.

9 “Geometric Algebra”. It states algebraic identities as theorems about equivalent geometric figures. This book contains a construction of “the section”, the division of a line into two parts such that the ratio of the larger to the smaller segment is equal to the ratio of the original line to the larger segment. It also generalizes the Pythagorean theorem to arbitrary triangles a result that is equivalent to the law of cosines. : gives details of properties of circles.

Book-III Book-IV

Deals with the construction of regular polygons, in particular the pentagon.

Book-V develops a general theory of ratios and proportions. It formed the

Foundation for a geometric theory of numbers until an analytic theory developed in the late 19 Century.

Book-VI :

Applies the theory of ratios to plane geometry, mainly triangles and parallelograms, culminating in the “application of areas” a procedure for solving quadratic problems by geometric means. Describes a method, antanaresis (now known as Euclidean algorithms) for finding the greatest common divisor of two or more numbers.

Book-VII

Book-VIII 6:3 examines numbers in continued proportions now known as

Book-IX

Geometric sequences (such as ax, ax^2, ax', ax'). Proves that there are infinite numbers.

Book-X Book-XI: deals with intersection of planes, lines and parallelepipeds.

Which comprises ¼ of elements

Book-XII: provides Eudoxus method of exhaustion

Book-XIII: culminates with the construction of fine regular platonic solids.

CONTRIBUTIONS

His major contribution in geometry was his book 'The Elements'. He gave many rules of geometry which are also used now a days. He was best known as father of geometry.

Euclid's five postulates are central to his plane geometry. Primary terms such as point and line are defined; unproved assumptions or postulates are stated. He was the first to prove that there are infinitely many prime numbers, he Contribution of Mathematicians

Stated and proved the unique factorization theorem; and he devised Euclid's algorithm for computing G.C.D. He proved that there are only five "Platonic Solids".

Euclid thought about three current problems of his time namely (a) dividing an angle into 3 equal parts

(b) making double of a cube (c) obtaining square from a circle

Other books of Euclid are 'The Division of the Scale' (a mathematical discussion of music), 'The Optics', 'The Cartoptrics' (a treatise on the theory of mirrors), a book on spherical geometry, a book on logical fallacies.

Several of his master pieces have been lost including works on conic sections and other advanced geometric topics. He solved unresolved problems related to irrational numbers. He is credited with the well known proof of the Pythagorean theorem.

He proved that It is impossible to find the "largest prime number", because if we take the largest known prime number, add 1 to the product of all the primes upto and including it. We will get another prime number. Euclid's proof for this theorem is generally accepted as one of the classic proofs because of its conciseness and clarity.

The year and the reason behind Euclid's death is unknown to mankind. However, there have been vague appropriations that suggest that he might have perished around 260 BC. His books and treatises were sold and used by personalities all over the world until the 19th Century. It is said that Lincoln would religiously carry the 'Elements' with him wherever he would go, and would often quote the genius of Euclid's work in his speeches. Even after Euclid's death, Mathematician continued

To write theorems and his work under his name. "If Euclid failed to kindle your youthful enthusiasm, then you were not born to be a scientific thinker."- Albert Einstein.

"Without art and maths, life would not be normal and harder to live."

PYTHAGORAS

- Pythagoras

Pythagoras was a Greek mathematician. The date and place of his birth are both unknown. He seems to have been born between 580 and 568 BC. Various stories are told of his parentage, but it was believed that his father was Mnesarchus, a merchant from Tyre and his mother Pythais a native of Samos. He is often described as the first pure mathematician who has contribkiuted immensely towards the development of mathematics. However, we know relatively50

little about his mathematical achievements. We have nothing much of Pythagora's writings and he remains a mysterious figure.

Little is known about his early life. As a child Pythagoras spent his early years in Samos but travelled widely with his father. Certainly he was well educated, learning to play the lyre, learning poetry and to recite Homer, Three philosophers influenced him when he was a young man. They were Pherekydes, Thales and his pupil Anaximander. He visited Egypt on the advice of his teacher Thales in order to study the "earth measurement" of Egyptian priests. Later, he became more popular than his master. He used to deliver lectures on philosophy and mathematics. His lectures were heard by persons of all ranks. The influence of Pythagoras on his listeners was so great that they formed themselves into a society called 'order of Pythagoreaus'. This influence was more religious than political. Theano, the daughter of his host, was the most attentive listener. Pythagoras later married Theano, who wrote a biography of her husband, which is not traceable.

Pythagoras never embodied his findings in any treatise. Due to the lack of good writing material he followed the custom of his time in passing his philosophy along by words of mouth. In the absence of written documents it becomes difficult to separate the work of Pythagoras himself from what is available at present in the form of Pythagorean contributions:

He was the first discoverer that earth was a sphere in the center of the Kosmos (Universe), that the planets, stars, and the universe were spherical because the sphere was the most perfect solid figure. He also taught that the paths of the planets were circular Pythagoras recognized that the morning star was the some as the evening star, Venus. He knew that the plane space about a point maybe filled by six equilateral

triangles, four squares or three regular hexagons.

He is credited to discover the proof on the theorem of a right angled triangle.

However, it is now known that the theorem had already been used by the

Babylonians.

He is credited for making geometry a science by basing it on axioms, postulates

and definitions and by setting down methods of proofs. He believed that all things are numbers. Mathematics is the basis for everything and geometry is the highest form of mathematical studies. The physical world can understood through mathematics. Pythagoras once said that "Number is the ruler of forms and ideas and the cause of gods and demons."

The sum of the angles of a triangle is equal to two right angles. The discovery of irrational numbers is attributed to Pythagoreans, but seems unlikely to have been the idea of Pythagoras because it does not align with his philosophy that all things are numbers, since numbers to him meant the ratio of whole numbers. According to Pytagoras, "Number rules the universes."

Pythagoras studied odd and even numbers, triangular numbers and perfect

numbers. Pythagoreans contributed to our understanding of angles, triangles, Contribution of Mathematicians

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Areas, proportion, polygon and polyhedra.

The over-riding dictum of Pythagoras school was “1 is number” or “God is number” and the Pythagoreans effectively practiced a kind of numerology and considered each number to have its own character and meaning e.g. 1 was the generator of all numbers; 2 represented opinion; 3 harmony; 4 justice; 5 marriage; 6 creation; 7 the planets or “wandering stars” etc. Odd numbers were thought of as female and even numbers as male.

●Pythagoras also related music to mathematics. He had long played the seven string lyre, and learned how harmonious the vibrating strings sounded when the lengths of the strings were proportional to whole numbers such as 2:1, 3:2, 4:3. Pythagoras also realized that this knowledge could be applied to other musical instruments.

The holiest number of all was ”tetractys” or ten, a triangular number composed of the sum of one, two, three and four. It is a great tribute to the Pythagoreans’ intellectual achievements that they deduced the

special place of the number 10 from an abstract mathematical argument rather than from something as mundane as counting the figures on two hands. He believed that each number had its own personality traits and all different and unique e.g. 10 is the best number because it contains four consecutive integers

(1+2+3+4=10). He discovered that any odd number say 2n+1 can be expressed as the difference of two squares: 2+1 (n+1)-n.

The Tetractys, an equilateral triangular figure consisting of 10 points arranged in four rows of 1, 2, 3 and 4 was both a mathematical idea and a metaphysical symbol fro the Pythagoreans.

3

Total

10

The Pythagoreans Tetractys

The Pythagoreans believed that the universe to be composed of five elements, one for each of the five regular solids. The earth arose from the cube, fire from pyramid (tetrahedron), air from the octahedron, water from the isosahedron and the sphere of the universe from the dodecahedron. Many mathematical terms like parabola, ellipse, etc. can be attributed to Pythagoras.

He Introduced a more rigorous mathematics than what had gone before, building from first principles using axioms and logic. Before Pythagoras it was believed that geometry is merely a collection of rules derived by empirical measurement. Pythagoras discovered that a complete system of mathematics could be

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constructed, where geometric elements corresponded with numbers, and where integers and their ratios were all that was necessary to establish an entire system of logic and truth.

He constructed a polygon equivalent to one given polygon and similar to another and could construct the five regular polyhedron.

Pythagoras studied the properties of areas and volumes and he was the first to prove that the circle contains a greater area than any plane figure with the same perimeter while the sphere contains a greater volume than any other shape bounded by the same surface.

In addition to being a philosopher and mathematician, Pythagoras believed in ethical practice related to mutual friendship, altruism and honesty. The Pythagorean society expanded rapidly after 500 BC, became politically active and was segmented into fractions. In 460 BC the society was violently suppressed, Pythagorean's were murdered and the meeting houses burned. In 508 BC Pythagoras escaped to Metapontium and committed suicide because of his inadequateness to deal with political events that brought a heavy penalty in form of attack and destruction of his society at croton.

Plato writes, "Presiding, like Pythagoras, over a band of intimate disciples who love him for the inspiration of his society and the way of life which the Pythagoreans called after their founder and which to this day distinguishes them from the rest of the world."