ALU SCHOOL OF MATHEMATICS

ALU MATHS NEWS

Volume 1, Issue 1 **News Letter** *Since 02/05/2016*

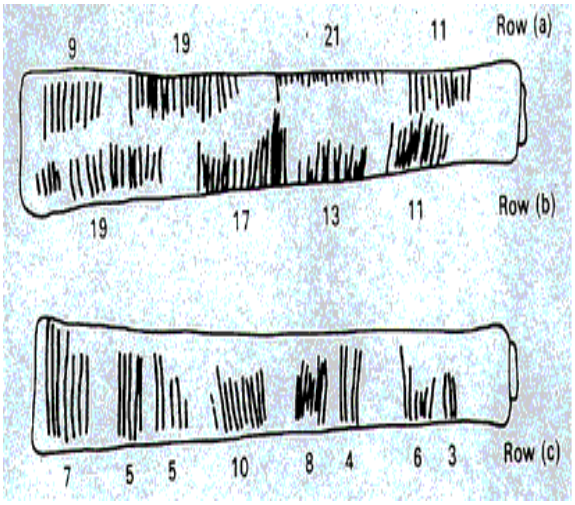
We are delighted to bring to you this issue of ALU Mathematics News, a monthly newsletter dedicated to the emerging field of Mathematics. This is the first visible —output from the Department of Mathematics, Alagappa University. We are committed to make ALU Mathematics News a continuing and effective vehicle to promote communication, education and networking, as well as stimulate sharing of research, innovations and technological developments in the field. However, we would appreciate your feedback regarding how we could improve this publication and enhance its value to the community. We are keen that this publication eventually grows beyond being a mere —news letter to become an invaluable information resource for the entire Mathematics community, and look forward to your inputs to assist us in this endeavor.

Dr. N. Anbazhagan

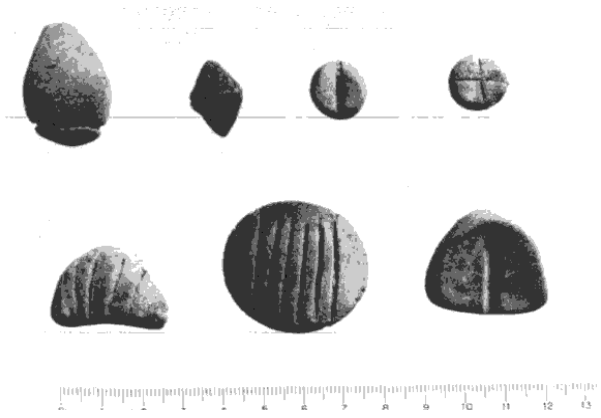
A Tidbit of History

Mathematics as a formal area of teaching and learning was developed about 5,000 years ago by the Sumerians. They did this at the same time as they developed reading and writing. However, the roots of mathematics go back much more than 5,000 years.

Throughout their history, humans have faced the need to measure and communicate about time, quantity, and distance. The Ishango Bone is a bone tool handle approximately 20,000 years old.



The picture given below shows Sumerian clay tokens whose use began about 11,000 years ago. Such clay tokens were a predecessor to reading, writing, and mathematics.



The development of reading, writing, and formal mathematics 5,000 years ago allowed the codification of math knowledge, formal instruction in mathematics, and began a steady accumulation of mathematical knowledge.

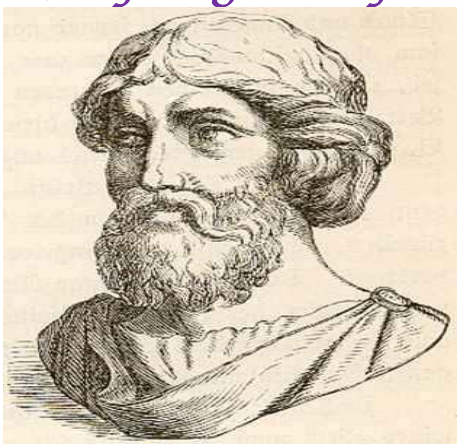
The real full form of mathematics

M- Miracle of nature
A- Art of arithmetic
T-- tool of knowledge
H- habit of problem solving
E- Evaluation of civilization
M- magic of numbers
A- application of rules
T- tool of knowledge
I- ideas of intellect
C- creativity of algebra
S- science of learning

Top 10 Greatest Mathematicians

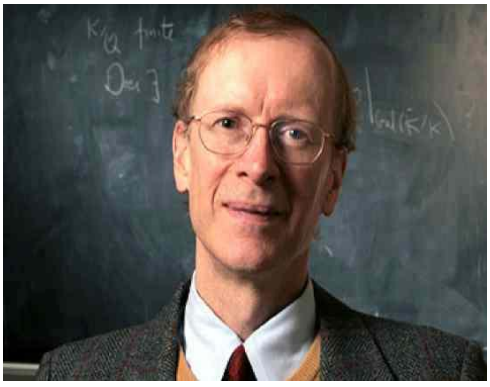
Often called the language of the universe, mathematics is fundamental to our understanding of the world and, as such, is vitally important in a modern society such as ours. Everywhere you look it is likely mathematics has made an impact, from the faucet in your kitchen to the satellite that beams your television programs to your home. As such, great mathematicians are undoubtedly going to rise above the rest and have their name embedded within history.

10) Pythagoras of Samos



Greek Mathematician Pythagoras is considered by some to be one of the first great mathematicians. Living around 570 to 495 BC, in modern day Greece, he is known to have founded the Pythagorean cult, who were noted by Aristotle to be one of the first groups to actively study and advance mathematics. He is also commonly credited with the Pythagorean Theorem within trigonometry. Thus, he could be called the founding father of modern mathematics.

9) Andrew Wiles



The only currently living mathematician on this list, Andrew Wiles is most well known for his proof of Fermat's Last Theorem: That no positive integers, a, b and c can satisfy the equation a^n+b^n=c^n For n greater then 2. (If n=2 it is the Pythagoras Formula). Although the contributions to math are not, perhaps, as grand as other on this list, he did 'invent' large portions of new mathematics for his proof of the theorem. passes (and more and more people can understand it).

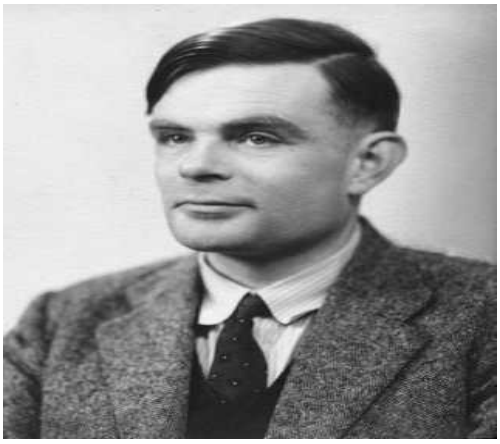
8) Isaac Newton and Wilhelm Leibniz

I have placed these two together as they are both often given the honor of being the 'inventor' of modern infinitesimal calculus, and as such have both made monolithic contributions to the field. To start, Leibniz is often given the credit for introducing modern standard notation, notably the integral sign. He made large contributions to the field of Topology.

7) Leonardo Pisano Blgollo

Blgollo, also known as Leonardo Fibonacci, is perhaps one of the middle ages greatest mathematicians. Living from 1170 to 1250, he is best known for introducing the infamous Fibonacci Series to the western world. In addition, from this Fibonacci also contributed greatly to the introduction of the Arabic numbering system. Something he is often forgotten for.Upon returning to Italy in 1202, he published his Liber Abaci, whereupon the Arabic numbers were introduced and applied to many world situations to further advocate their use.

6) Alan Turing



Computer Scientist and Cryptanalyst Alan Turing is regarded my many, if not most, to be one of the greatest minds of the 20th Century. Having worked in the Government Code and Cypher School in Britain during the second world war, he made significant discoveries and created ground breaking methods of code breaking that would eventually aid in cracking the German Enigma Encryptions. Furthermore, he wrote a range of brilliant papers on the subject of computing that are still relevant today, notably on Artificial Intelligence, on which he developed the Turing test which is still used to evaluate a computers 'intelligence'. Remarkably, he began in 1948 working with D. G. Champernowne, an undergraduate acquaintance on a computer chess program for a machine not yet in existence. He would play the 'part' of the machine in testing such programs.

5) René Descartes

French Philosopher, Physicist and Mathematician Rene Descartes is best known for his 'Cogito Ergo Sum' philosophy. Despite this, the Frenchman, who lived 1596 to 1650, made ground breaking contributions to mathematics. Alongside Newton and Leibniz, Descartes helped provide the foundations of modern calculus (which Newton and Leibniz later built upon), which in itself had great bearing on the modern day field. Alongside this, and perhaps more familiar to the

reader, is his development of Cartesian Geometry, known to most as the standard graph (Square grid lines, x and y axis, etc.) and its use of algebra to describe the various locations .

4) Euclid

Living around 300BC, he is considered the Father of Geometry and his magnum opus: Elements, is one the greatest mathematical works in history, with its being in use in education up until the 20th century. Unfortunately, very little is known about his life, and what exists was written long after his presumed death. Nonetheless, Euclid is credited with the instruction of the rigorous, logical proof for theorems and conjectures.

3) G. F. Bernhard Riemann

Bernhard Riemann, born to a poor family in 1826, would rise to become one of the worlds prominent mathematicians in the 19th Century. The list of contributions to geometry are large, and he has a wide range of theorems bearing his name. To name just a few: Riemannian Geometry, Riemannian Surfaces and the Riemann Integral. However, he is perhaps most famous (or infamous) for his legendarily difficult Riemann Hypothesis; an extremely complex problem on the matter of the distributions of prime numbers. However, a prize of $1 million has been offered from the Clay Maths Institute for a proof, and one would almost undoubtedly receive a Fields medal if under 40 (The Nobel prize of mathematics).

2) Carl Friedrich Gauss

Child prodigy Gauss, the 'Prince of Mathematics', made his first major discovery whilst still a teenager, and wrote the incredible Disquisitiones Arithmeticae, his magnum opus, by the time he was 21. Many know Gauss for his outstanding mental ability – quoted to have added the numbers 1 to 100 within seconds whilst attending primary school (with the aid of a clever trick). After graduating in 1798 (at the age of 22), he began to make several important contributions in major areas of mathematics, most notably number theory (especially on Prime numbers). He went on to prove the fundamental theorem of algebra, and introduced the Gaussian gravitational constant in physics, as well as much more – all this before he was 24!

1) Leonhard Euler

If Gauss is the Prince, Euler is the King. Living from 1707 to 1783, he is regarded as the greatest mathematician to have ever walked this planet. It is said that all mathematical formulas are named after the next person after Euler to discover them. In his day he was ground breaking and on par with Einstein in genius. His primary (if that's possible) contribution to the field is with the introduction of mathematical notation including the concept of a function (and how it is written as f(x)), shorthand trigonometric functions, the 'e' for the base of the natural logarithm (The Euler Constant), the Greek letter Sigma for summation and the letter 'i' for imaginary units, as well as the symbol pi for the ratio of a circles circumference to its diameter. As well as this, he also solved the Seven Bridges of Koenigsberg problem in graph theory.

New Discoveries in Mathematics

PETER SARNAK receives wolf prize in Mathematics

Peter Sarnak, the Eugene Higgins Professor of Mathematics, was awarded the 2014 Wolf Prize in Mathematics. The Wolf Prizes are awarded annually by the Wolf Foundation in the fields of agriculture, chemistry, mathematics, medicine, physics and the arts. The prize was awarded to Sarnak, along with seven laureates from other fields, by Israeli President Shimon Peres on June 1, 2014, at the Knesset.

The Wolf Foundation noted that Sarnak is "a mathematician of an extremely broad spectrum with a far-reaching vision. He has impacted the development of several mathematical fields, often by uncovering deep and unsuspected connections." The award citation further noted his work on **eigenfunctions of quantum mechanical Hamiltonians,** his work on L-functions, and the exploration of the link between random matrix theory and the statistical properties of zeros of the Riemann zeta function. Sarnak's work has also had "a huge impact on combinatorics and computer science," according to the citation, which also noted: "By his insights and his readiness to share ideas he has inspired the work of students and fellow researchers in many areas of mathematics."

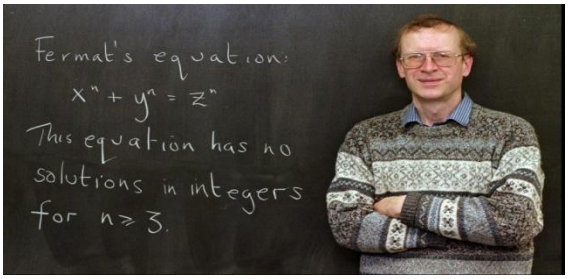
American Mathematical Society awards Steele Prizes to Yakov Sinai, Philip Holmes

Professor of Mathematics Yakov Sinai was awarded the American Mathematical Society (AMS)'s Leroy P. Steele Prize for Lifetime Achievement, one of the highest distinctions in mathematics. Sinai was honored for his "pivotal role in shaping the theory of dynamical systems and for his groundbreaking contributions to ergodic theory, probability theory, statistical mechanics and mathematical physics," according to the AMS. The prize recognizes the breadth and depth of the recipient's mathematical work as well as the recipient's influence on mathematics through Ph.D. student supervision.

Philip Holmes, the Eugene Higgins Professor of Mechanical and Aerospace

Engineering, was the co-winner of the Leroy P. Steele Prize for Mathematical Exposition along with John Guckenheimer for the book *Nonlinear Oscillations, Dynamical Systems, and Bifurcations of Vector Fields.*

The 2016 Abel Prize In Mathematics



The 2016 Abel Prize in Mathematics has been awarded to Sir Andrew Wiles of the University of Oxford.

Established in 2002, the prize honors one of Norway's most famous mathematicians, Niels Henrik Abel. He is most famous for proving the impossibility of solving the general quintic equation via radicals (translation: you probably remember the quadratic formula for finding solutions of polynomials of degree 2, and there are similar formulas for polynomials of degrees 3 and 4; Abel showed there is no such formula for polynomials of degree 5 or higher), but he had a significant impact on mathematics beyond that in his short 26-year life.

In contrast to the Fields Medal, which is reserved for mathematicians under the age of 40, the Abel Prize is open to any mathematician, regardless of age or previous prizes. Many of the prior Abel Laureates are also Fields Medalists (e.g., Jean-Pierre Serre, John Milnor, Pierre Deligne), and so one might view the prize as more akin to the Nobel Prize--a sort of lifetime achievement award. Administered by the Norwegian Academy of Science and Letters and funded by the national government, the Abel Prize comes with a monetary award of 6 million Norwegian kroner (about $700,000).

The prize committee cited Wiles's monumental 1995 proof of Fermat's Last Theorem "by way of the modularity conjecture for semistable elliptic curves, opening a new era in number theory.

Wiles received international acclaim for his work, including special recognition from the International Mathematical Union (a "quantized Fields Medal" someone called it at the time), and several other prizes and honors. In 2010, he returned to Oxford as a Royal Society Research Professor.

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