

The Map of Mathematics

- Ananya Saikia, 5th Sem, Dept of Mathematics, Darrang College

It is difficult to imagine a world without mathematics. Even we could easily dream of a history devoid of the conventional learning applied mathematics had made possible. It starts the mind to imagine a world without even simple counting. Mathematics is a very vast subject and many of topic are include it. Let's have a look how these topic are mapped –

Mathematics are Divided into two categories –

1. Pure Mathematics
2. Applied Mathematics

Pure mathematics explores the boundary of mathematics and pure reason. Its purpose is to search for a deeper understanding and an explained knowledge of mathematics itself. In earlier People Develop Pure mathematics to satisfied their curiosity, but after 100 years later pure mathematics method are used for solving real world problems like engineering, eco-physic finance, Bio-Chemistry, Astronomy etc. And then born a new branch of mathematics,

Applied mathematics which deals with mathematics method the used physical world. Pure mathematics is made in several section. The study of NUMBERS SYSTEMS Starts with natural numbers 1,2,3,...and integers which included positive and Negative numbers and arithmetical operations on them. The deeper properties of Integers are studied in number theory. In number systems are included other kind of numbers like rational numbers which included

Fractions and real numbers like π , square roots of 2,3,5...and infinity decimal numbers. And complex numbers which included whole real and imaginary numbers. Another area of study is the size sets, which is describe with the cardinal numbers. Mathematical objects, such as sets of numbers and function, exhibit internal STRUCTURE as a consequence of operations or relations that are define on sets. Mathematics then studies properties of those sets that can be expressed in terms of that structure, for instance number theory studies properties of the set of integers that can be expressed in terms of arithmetic operations. It's also included the equations of one, two and three unknown variables. And abstract algebra which can often be applied to unreal problems were solved using Field theory and group theory. The study groups, rings, Fields and others abstract systems, together such studies constitute the domain of abstract algebra. Another examples of algebraic theory is linear theory, which is general study of vectors space whose element called vectors. Combinatorial studies ways of

enumerating the numbers of objects that fit a given structure. The study of space originates with geometry. In Particular, Euclidean Geometry, which combine space and numbers and encompasses the well-known Pythagorean Theorem. Trigonometry is the branch of mathematics that deals with relationships between the sides and angles of triangles and with

Trigonometric functions. Modern study of space generalize these ideas to included higher-dimensional geometry non-Euclidean geometry and topology. Differential geometry are concept are fibre bundles and calculus on manifolds in particular, vector and tensor calculus. Topology has been the greatest Growth area in 20th century mathematics, it includes point-set topology, Set-theoretic topology, algebraic topology and differential topology. Topology also includes the now solved Poincare conjecture and still unsolved areas of the Hodge conjecture. Other results in geometry and topology, including the four colour theorem and Kepler conjecture, have been prove only with the help of computers. It's also includes Fractal geometry and Measure theory.

Understanding and describing CHANGE is a common theme in the natural Sciences, and calculus was develops as a powerful tool to investigate it. The rigorous study of real numbers and functions of a real variable is known as real analysis, with complex analysis the equivalent Feld for the complex numbers. Many problems lead naturally to relationships between quantity and its rate of change and these studied as differential equations. Many phenomena in nature can be described by dynamical systems, chaos theory makes precise the way in which many of these systems exhibit unpredictable yet still deterministic behaviour.

Applied Mathematics: Applied mathematics has significant overlap with the discipline of statistic, whose theory is formulated mathematically, especially with probability theory. statistical theory studies decision problems such as minimizing the risk of statistical action, such as using a procedure. Applied mathematics are included also computational mathematics

Which is a study of methods for solving mathematical problems that typically too large for human numerical capacity. Mathematics are used in also mathematical physic, bio-chemistry, engineering like building things and electrical system like airplane and dynamical systems. Game theory also branch of mathematics concern with the analysis of strategies for dealing

-with compete situatons. it has been applied to contexts in war, Business and biology. Numerical analysis studies methods for problems in analysis using functional analysis and approximation theory, numerical analysis included the study of approximation and discretization broadly with special concern for rounding errors. Numerical analysis and more

Broadly, scientific computing also study non-analytic topics of mathematical science, especially algorithmic matrix and graph theory. Mathematical physics refers to development of mathematical methods for application to problems in physics. The journal of Mathematical physics defines the field as “the Application of Mathematics to problems in physics and the development of mathematical methods suitable for such application and for the formulation of physical theories.” In physics and engineering, fluid dynamics is a sub-discipline of fluid mechanics that describes the flow of fluid. It has several sub-disciplines, including aerodynamics and hydrodynamics. We saw that mathematics related with all parts of the real world.

According to some great philosophers, all thing in the universe can be explained through Mathematics and we can better understand the universe through it.