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MATHEMATICS OMNISCIENCE

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ABSTRACT

Mathematics inculcates the power of reasoning, creativity, abstract or spatial thinking, critical thinking, problem-solving ability and even effective communication skills. From times immemorial, mathematics has been the backbone of any civilization. Mathematics is the cradle of all creations, without which the world cannot move an inch.

Mathematics was developed to understand the cycles of nature as observed in the seasons. Mathematics is the body of knowledge centred on such concepts as quantity, structure, space, and change. The logical acumen engendered during the study of Mathematics is indispensible in dealing with the challenges of life.

Mathematics is the only language shared by all human beings regardless of culture, religion, or gender. Disciplines such as economics, sociology, psychology, and linguistics all now make extensive use of mathematical models, it is an essential tool in many fields, including biology, chemistry, ecology, economics, engineering, medicine, physics and many others.

Mathematical research establishes truth by rigorous deduction from appropriately chosen axioms and definitions. Knowledge and use of basic mathematics have always been an inherent and integral part of individual and group life. Mathematics intelligence is real, it's lasting, and nobody can ever take it away from anyone.

Keywords*: *Concepts, Humans, Knowledge, Mathematics, Numbers.

Mathematics inculcates the power of reasoning, creativity, abstract or spatial thinking, critical thinking, problem-solving ability and even effective communication skills. Mathematics, the study of logic, deductions, and applications is the tool that creates this problem solving attitude in a human being. Mathematics deals with numbers and all the operations that can be applied on them.

Mathematics is the cradle of all creations, without which the world cannot move an inch. Be it a cook or a farmer, a carpenter or a mechanic, a shopkeeper or a doctor, an engineer or a scientist, a musician or a magician, everyone needs mathematics in their day-to-day life. There are countless examples of mathematical patterns in nature's fabric. Even insects use mathematics in their everyday life for existence. Snails make their shells, spiders design their webs, and bees build hexagonal combs.

From times immemorial, mathematics has been the backbone of any civilization. Most modern cities are planned using mathematical tools. It is impossible to even imagine a structured society without the knowledge of mathematics at its core.

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Human beings didn't invent math concepts; we discovered them. The inventor of calculus was none other than Sir Isaac Newton, whose other discoveries, such as his laws of motion and gravity, changed forever the way we have been able to understand how the world works. Many mathematicians and physicists applied the basic laws of Newton to obtain mathematical models for solid and fluid mechanics. This is one of the most widely applied areas of mathematics, and is also used in understanding volcanic eruptions, flight, ocean currents.

The earliest applications of mathematics are known to be for exchange based trading, measurement of land sizes and time period recordings. The earlier civilizations around 3000 BC created the sub-entities of mathematics like geometry, algebra and number systems. Vedic mathematics, a culture devoted to simplifying advanced mathematics, was a revolution of sorts.

Mathematics was developed to understand the cycles of nature as observed in the seasons. Ancient people understood the need to define time in relation to celestial movements for agricultural, astronomical, astrological and navigational reasons. They looked at the mathematics of astronomy, its relationship to the inventions of various cultural-historical calendars, and the division of time into units of hours.

Mathematics is the body of knowledge centred on such concepts as quantity, structure, space, and change, and also the academic discipline that studies them. Benjamin Peirce called it "the science that draws necessary conclusions". Without math we won't be able to do science, nursing, engineering, become a doctor or even get a business degree. Our very livelihood is dependent on our ability to calculate, subtract or multiply.

While mathematics has its own internal development, usually known as pure mathematics, it is also an essential tool in many fields, including biology, chemistry, ecology, economics, engineering, medicine, physics and many others. The area of mathematics that is concerned with applications of mathematical knowledge to other fields is usually referred to as applied mathematics.

Prominent sciences like physics and chemistry would be rendered incomplete without the aid of mathematical theories. Graphs, pie-charts, histograms; all mathematical tools, allow easy and effective representation of information in graphical form, thus facilitating easier understanding.

In mathematical physics, some basic axioms about mass, momentum, energy, force, temperature, heat etc. are abstracted, from observations and physical experiments and then the techniques of abstraction, generalization and logical deduction are used.

Fluid Dynamics is also very important in Atmospheric Sciences, in dynamic meteorology and weather prediction.

Math is extremely important in physical chemistry especially advanced topics such as quantum or statistical mechanics. Quantum relies heavily on group theory and linear algebra and requires knowledge of mathematical, physical topics such as Hilbert spaces and Hamiltonian operators.

Mathematics is a strict rule based subject, and there is no scope for ambiguity in its study. The logical acumen engendered during the course is indispensible in dealing with the challenges of life. The whole industry of architecture thrives on measurements, and mathematics simplifies and organizes the art of measurements.

Over centuries, mathematics has shaped the way the human society sustains itself. The momentous stature of mathematics is evident in the fact that GDP, a purely mathematical concept, is considered as a pellucid indicator of the growth of a country. Statistical mechanics relies heavily on probability theory. Pure scientific research in

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chemistry and biology also needs mathematicians, particularly those with higher degrees in computer science, to help develop models of complicated processes.

Mathematics builds confidence, keeps one from getting ripped off, helps one out with sales and pricing, following recipes and most of all math sharpens one's brain. Math actually makes one smarter in all areas. Intelligence is real, it's lasting, and nobody can ever take it away from anyone. One of the best ways to sharpen the brain and develop intelligence is to study mathematics. It challenges and strengthens the mind in a way that very few other things do.

Through the use of abstraction and logical reasoning, mathematics evolved from counting, calculation, measurement, and the systematic study of the shapes and motions of physical objects. Knowledge and use of basic mathematics have always been an inherent and integral part of individual and group life.

Mathematics is used widely in chemistry as well as all other sciences. Mathematical calculations are absolutely necessary to explore important concepts in chemistry. Without some basic mathematics skills, these calculations, and therefore chemistry itself, will be extremely difficult.

Biomathematics is a rich fertile field with open, challenging and fascination problems in the areas of mathematical genetics, mathematical ecology, mathematical neuron- physiology, development of computer software for special biological and medical problems. Mathematics is deeply involved in bioinformatics, which is vital in modern health research, to understanding how complex ecosystems work and, through statistical science,

Three-dimensional topology and two-dimensional differential geometry are two additional areas of mathematics when it interacts with biology. Its application is also very important to cellular and molecular biology in the area of structural biology. This area is at the interface of three disciplines: biology, mathematics and physics.

How can math be so universal? First, human beings didn't invent math concepts; we discovered them. Also, the language of math is numbers, not English or German or Russian. If we are well versed in this language of numbers, it can help us make important decisions and perform everyday tasks. Math can help us to shop wisely, buy the right insurance, remodel a home within a budget, understand population growth, or even bet on the horse with the best chance of winning the race.

Mathematics is the only language shared by all human beings regardless of culture, religion, or gender. Pi is still approximately 3.14159 regardless of what country you are in. Adding up the cost of a basket full of groceries involves the same math process regardless of whether the total is expressed in dollars, roubles, or yen. With this universal language, all of us, no matter what our unit of exchange, are likely to arrive at math results the same way.

"The universe cannot be read until we have learned the language and become familiar with the characters in which it is written, which is mathematical language, the letters are triangles, circles and other geometrical figures, without which it is humanly impossible to comprehend a single word. Without these, one is wandering about in a dark labyrinth". -----Galileo Galilei.

We can build computers and transfer information across the globe. Maths is not just for calculus majors. It's for all of us. And it's not just about pondering imaginary numbers or calculating difficult equations. It's about making better daily decisions and, hopefully, leading richer, fuller lives. Disciplines such as economics,

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sociology, psychology, and linguistics all now make extensive use of mathematical models, using the tools of calculus, probability, and game theory, network theory, often mixed with a healthy dose of computing.

A great deal of mathematical thinking goes in the task of national economic planning, and a number of mathematical models for planning have been developed. The models may be stochastic or deterministic, linear or non-linear, static or dynamic, continuous or discrete, microscopic or macroscopic and all types of algebraic, differential, difference and integral equations arise for the solution of these models.

And in gaining a deeper understanding of the physical, chemical and ecological processes that control our weather, meteorologists are able to build complex systems of linked differential equations to describe and predict our weather patterns.

Mathematics is the study of numbers, quantity, space, structure, and change. Mathematicians seek out patterns and formulate new conjectures. Mathematicians resolve the truth or falsity of conjectures by mathematical proofs, which are arguments sufficient to convince other mathematicians of their validity. Mathematical research establishes truth by rigorous deduction from appropriately chosen axioms and definitions. Mathematical structures are good models of real phenomena, and mathematical reasoning often provides insight or predictions.

Through the use of abstraction and logical reasoning, mathematics developed from counting, calculation, measurement, and the systematic study of the shapes and motions of physical objects. Practical mathematics has been a human activity as back as written records exist. Rigorous arguments first appeared in Greek mathematics, most notably in Euclid's Elements. Mathematics developed at a relatively slow pace until the Renaissance, when mathematical innovations interacting with new scientific discoveries led to a rapid increase in the rate of mathematical discovery that continues to the present day.

Mathematics is a highly interconnected subject that involves understanding and reasoning about concepts, and the relationships between them. It is learned not just in successive layers, but through revisiting and extending ideas. As such, the mathematical needs of learners are distinctive from their more general educational needs. Mathematics is used throughout the world as an essential tool in many fields, including natural science, engineering, medicine, and the social sciences.

In Political Science, past election results are analysed using Game Theory to see changes in voting patterns, influence of various factors on voting behaviour. Graph theory, text analysis, multidimensional scaling and cluster analysis, and a variety of special models are some mathematical techniques used in analysing data on a variety of social networks. The market value of Google, Amazon, Facebook and Twitter, all built on intellectual property based on mathematical algorithms, is not much short of half a trillion dollars at current market value.

Mathematics is even necessary in psychology and archaeology. Archaeologists use a variety of mathematical and statistical techniques to present the data from archaeological surveys and try to distinguish patterns in their results that shed light on past human behaviour.

In Population Dynamics, we study deterministic and stochastic models for growth of population of micro-organisms and animals, subject to given laws of birth, death, immigration and emigration. In Mathematical Ecology, we study the prey predator models and models where species in geographical space are considered. Epidemic models for controlling epidemics in plants and animals are considered and the various mathematical models pest control is critically examined.

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In Mathematical Genetics, we study the inheritance of genetic characteristics from generation to generation and the method for genetically improving plant and animal species. Decoding of the genetic code and research in genetic engineering involve considerable mathematical modelling. In Drug kinetics, we study the spread of drugs in the various compartments of the human body. In mathematical models for cancer and other diseases, we develop mathematical models for the study of the comparative effects of various treatments.

In Pollution Control Models, we study how to obtain maximum reduction in pollution levels in air, water or noise with a given expenditure or how to obtain a given reduction in pollution with minimum cost. Interesting non- conventional mathematical programming problems arise here.

Mathematics is also used in many other areas of finance, from banking and trading on the stock market, to producing economic forecasts and making government policy.

This also works in insurance, setting premiums to match liabilities.

Thus Mathematics crowned above all disciplines of knowledge. From a scientific point of view, however, if we start with one statement about nature, and end up with another statement about nature, what we have been doing is thinking about nature. Mathematics mechanizes thinking. That's why we use it to solve problems! One could possibly figure it out without the help of mathematics, but mathematics makes it so much easier because all one has to do is follow the rules!

Over the centuries there has been spectacular progress in the development of Mathematics as a branch of knowledge. And without the application of Mathematics on a wide scale no country can march forward in line with the general progress of human knowledge and thought.

"As far as the laws of mathematics refer to reality, they are not certain; and as far as they are certain, they do not refer to reality"-Albert Einstein.

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