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The History of Mathematical Concepts

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Abstract

The deconstruction of numbering and formulation concepts assist a researcher or clinician in undertaking a real-world scenario problem. It also comprises thinking, extracting, and logically manipulating abstract concepts. From mathematical language and data literacy to well-profounded ideas and concepts. From a historical review to a future complexion of numbers, it signifies the importance of critical and fair judgment in finance and other problem-solving areas. Brainstorming ideas and laying out the mathematical designs for problem-solving ensures steadfast and robust methods in accounting for numbers. Arithmetic numerical systems and geometrical shapes and sizes come in symmetrical patterns and irregular forms. A numerical interpretation and symbolic understanding unravel the truth behind debatable arguments in proving mathematical concepts. Thus, mathematical concepts have existed for a long time, and nowadays, people find them debatable in search of a definite cause by bringing certainty into place. It is debatable, and people are trying to find the best solution to their daily problems. Numbers and figures are symbolic for an analogy of the real-world scenario. Using numbers to solve a problem can be a proper referencing system that is more accurate and precise with uncertainties. Logical thinking assists decision-makers in practicing their interests in searching for truthful quests and thirst for new knowledge.

INTRODUCTION

Mathematics is a structural pattern and relationship in the numbering system, measuring accuracy, and the shapes of objects [1]. From basic calculations to the complexity of numbers, Mathematics was expanded from Europe to North America in the 15th until 20th century [1]. In getting to know numbers and figures, Mathematics originated from Mesopotamia and Egypt, as well as ancient Greece and Islamic civilizations from the 9th to 15th century [1]. From the Alexander the Great era, there are older texts and scriptures on Euclid's elements and Byzantine carbonated dates from the 10th century [1]. Theorems and arguments are defending their results and findings for future projections. They attempted to build and invent a new set of mathematical tools to bridge the gap. Thus, mathematical concepts still have not been popularised and referred to for a more practical application. The application of mathematics is broadened to different areas of science as well. There were explanations and illustrations to

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simplify the solutions to real-world scenarios. The real-world scenarios tend to disappoint them with complexity and indirect answers in this abstract world. Some were even drowned by and blown away by numbers without supportive judgment. This mini-review will describe and report the historical value and ideas of exploration dated from earlier centuries. The randomization process is still under investigation for its selection and unbiased estimates so as not to be judgemental and to have an equal chance of being analyzed. There are no standardized procedures to make it an understandable concept that would be helpful for prospects**.**

METHODS

Each section is an overview and concludes with remarks on the mathematical theorems to develop problem-solving concepts. The numbers do not exist by itself without counting and trying to sum up the totals. It also addresses numerical issues, such as building a pyramid and astrolabes to observe the Sun and Moon. In this mini-review, there are more discoveries to uncover in time allocation and scheduling of historical events based on ancient Calendars. It sounds astronomical and architectural, but the abstract concepts brought to the early days of mathematical trajectories and projections. Thus, the following sections embrace the power of time and megalithic structures for future endurance.

RESULTS AND DISCUSSION

Rationality Of Numbers

It touches on axiomatic methods to conic sections [1]. After reaching certainty, European mathematics dates back to the 11th to 15th century [1]. Then, they have a recorded statement of accounting duties by solving algebraic expressions and Pythagoras' theorem as some of the practical tools [1]. The three historical mathematical problems are doubling a cube, trisecting the angle, and squaring the circle [1]. Mathematics and astronomy are two synchronizing fields for future application.

The old Sumerian has an additive of 10 extracted from Egypt's numerical system [1]. Thus, the operation of the division is 10's, 20's, and so on, which is easy to calculate [1]. To overcome the largeness of the divisor, Babylonians decided to have a replacement by placing a value [1]. Then, a mathematical tablet from the Babylonian era signifies a square root of numbers [1]. Algebraic expressions and sexagesimal numerals (a division for the value of 60, such as number of hours, minutes, and so on).

The number of seconds in a minute and minutes in an hour originated from the base-60 numeral system of ancient Mesopotamia [3]. The world itself puts its rotation of numbers based on Hindu-Arabic origin [3]. Since 60 has most of the numbers as the divisor, it is considered eligible for positive integers [3]. As mentioned, base 60 is more relevant than base **ten** since it is divisible by the number 3 [4]. Further, fractions divisible by factors of 2 and 5 have finite decimal representations in time [4]. One of his famous arguments is that space and time are infinitely divisible and remain unanswered [6]. The term linear continuum sounds like an infinite and unstoppable process that goes on and on without definite limitations. Thus, the features are composed of indivisible points as a set of numbers that get bigger over time, and the points are so close to each other [5]. For instance, the physical space is two-dimensional [5].

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Geometrical in Shape

Mathematics can be abstract even in outer space using radical shapes, relative shapes, symmetrical readings, and number sequencing to view the aspect of having a geometrical dimension [8]. The universe is bounded by the law of gravitational pull and set into motions for its quantum theories and mechanical movements in space [9]. Around 400 years ago, the universe had either geocentric or heliocentric orbital functions [10]. Then, Kepler's second theorem uncovers the buried Moon to Earth distance in a circular motion across time variants [11]. Under three conditional states, the planets travel in ellipses by accounting for different sets of parameters, orbit across the Sun, and have orbital periods for inconsistencies in time [12].

Apollonius is one of the contributors to the geometrical world of Islam [13]. The canonical shapes of curves include circles, ellipses, parabolas, and hyperbolas [13]. Before this, the canonical subject was not very well-versed in the world of mathematics [14]. Instead, Euclid's Elements managed to resound its theorem [15]. Symmetrical lines were reflected from different sections to form a curvature [16].

In the 11th century, Adelard of Bath proposed to use the Fibonacci sequencing method to bring Islamic understandings and teachings to Europe [2]. Algebra is a number theory, geometry, and analysis conducted by Muhammad ibn Musa al-Khawarizmi in the translated book, which touches on linear and quadratic equations [19]. In the Babylonian era (1900 to 1600 BC), algebra was reigned as the Pythagorean's triplets in linear and quadratic expressions of three terms, a, b, and c [19]. In 1650 BC, the Egyptian mathematician paved the way for expressing algebraic equations in a form without quadratic terms [19]. Then, in China, algebraic contributed to many literature texts to signify the elements of the Earth by using different degrees of polynomials for more exploration in mathematics [19]. Greece is more interested in making a geometrical sense out of algebraic expressions with the involvement of Thymaridas, Euclid of Alexandria, and Diophantus [19].

"Bloom of Thymaridas" proposed to divide all the numbers by the previous sum of a pair of sequenced numbers. During Euclid's time, algebraic expressions were in the Cartesian axis sections in which the lines are magnitudes consisting of directions and volumes. In the modern era, algebraic expressions are solvable using known or unknown magnitudes (with and without units of measurement) in terms of theory or practicality [17]. Similarly, Diophantus outnumbered the idea of using algebra for geometrical relationships among the terms. Thus, in India, the applications of algebra were made to work in Hindu literature, including Aryabhatta, Brahma Sphta Siddhanta, and Bhaskara II, and it was taken to another level [18].

In the third of the 17th century, Isaac Newton and Gottfried Leibniz invented calculus [20]. The rate of change involves instantaneous change in integration and derivation processes. It

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includes the interception and gradient of a slope to locate the direction and magnitude of a Cartesian section of a plane. Then, in the 19th century, limitations and derivatives were also proposed to find the input values of a given algebra expression [21]. Geometrical shapes and volumes are in the face of 3-D dimensions. The symmetrical lines support the structure and motion of the rotation at a certain degree of distance and angle [21].

Randomization as Sampling Procedure

Randomization is one of the best decision-making tools involving transition probabilities to have a fixed solution for an event [22]. The time factor is more complex. Having a randomized concept removes the time effect from the factor influencing it. The time event usually varies from one observation to another. Thus, the calculation is more exquisite and sophisticated as the mathematical model develops.

As mentioned before, there were interaction plots either in a parallel or cross-over with one another. Yes, it is another spurious or second-guessing of a mathematical theory and practice. At first, the variables have a significant relationship, but are there any underlying or hidden nodes between them called mediating variables?

For instance, the mathematical notation of $\emptyset = \boldsymbol{\theta_A} - \boldsymbol{\theta_B}$ is to notify the comparison between the two subheadings. After undergoing the two treatments of A and B, the proceeding example has led to another accountable event that is [23],

$$\boldsymbol{Y_{Ai}} = \boldsymbol{\theta_A} + \boldsymbol{\delta_{Ai}}, \boldsymbol{i} = \boldsymbol{1}, \dots, \boldsymbol{n_A}, \quad (1)$$

$$\boldsymbol{Y_{Bj}} = \boldsymbol{\theta_B} + \boldsymbol{\delta_{Bj}}, \boldsymbol{j} = \boldsymbol{1}, \dots, \boldsymbol{n_B} \quad (2)$$

Both equations notified a regressed value for both observations in two variables.

Regarding survival analysis, the hazard ratio compares the treatment and placebo groups of a specific incidence or prevalence [24]. The group of patients who received treatment mainly was better than those in the placebo group after randomization [25]. Sometimes, more or less weighing causes an imbalanced ratio between the two groups. Making it standardized is another way to overcome it.

In some situations, zero heterogeneity happens as the effectiveness of a treatment for the patients is the same [26]. Therefore, psychologically and therapeutically, they received a kind of treatment that is also beneficial for their continuity [27]. However, there are side effects to antipsychotic medicine for gaining weight. In this research, heterogeneity refers to the population effect sizes that differ across studies [28].

Visuospatial is another cognitive skill that maps self-perceptions and concepts [28]. The simple theorem represents the analogy of the real-world case scenario, such as a sudden hit on the head recalling the memory and initiating a foreign language that is new to them. A famous female astronomer proposes that having colors as a certain amount of heat ignites different stars in the galaxy. Thus, readable data from the Hubble scope supports the overall theory.

The reenactment and replications of a result of a finding produce heterogeneous concepts that vary from each other [28]. It is not only p-value but also magnitude toward effect sizes, Cohen's d [28]. The formulation of Cohen's d is as follows [29]:

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$$Effect\ Size = \frac{[Mean\ of\ experimental\ group] - [Mean\ of\ control\ group]}{Standard\ Deviation} \quad (3)$$

The effect sizes are ranked from the lowest of 0.2 to the highest of 0.8. These are threshold values for different magnitudes**,** which is very unlikely for a significant p-value easily influenced by the sample size. Thus, effect sizes would be a good measurement of the magnitude of the relationship between two variables [29].

A simple random sample in which each element has an equal chance of being selected without replacement. Thus, there is a lower risk for both sampling and selection bias (Thomas, 2023). As non-random data enters the survey, there is a sample selection bias [31]. The data removal has an impact on the significance of the p-value. Another way to overcome this is by assigning weights to avoid misrepresenting observations [31].

Hierarchical analysis is a subgroup of homogenous subjects divided into a similar category [32]. The agglomerative and divisive strategies are for hierarchical mappings among the nodes [32]. From less coherent power to the greatest. From indefinite clutter of mind to the most organized one. From being indecisive into a decisive argument. Dendrograms act as a branching mechanism in bridging two similar clusters in a most definite form of decision-making [32].

The disjoint information means a lack of intelligibility or relations to each other. The local dissimilarity map includes matrixing between two input pictures, which resembles pixelating. Deep learning is viable for complexity in picturing and matrixing an image based on an Euclidean distance. The blurry image of the size of a pixel may contribute significant information for further analysis in making a conclusion based on the data relevancy. The simple calculation is that having a surface area of an image and picture in another dimension requires a rigorous amount of time to do.

CONCLUSION

In conclusion, mathematics concepts arrived as workable and understandable logically. The testability and generalisability of a mathematical concept within the population. Evaluation matrices and performance tests to ensure the viability of a workable and well-presented mathematical model in this world. The domain of knowledge and spatial mapping of the school of thought allows a person to make up their mind in solving a problem more creatively.

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