

A Brief Note on Applied Mathematics

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Commentary

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DESCRIPTION

Applied mathematics

The use of mathematical methods in many domains such as physics, engineering, medicine, biology, finance, business, computer science, and industry is known as applied mathematics. As a result, applied mathematics is a mix of mathematics and specialised expertise. The phrase "applied mathematics" also refers to the field of mathematics in which mathematicians use mathematical models to solve real-world issues.

Practical applications have sparked the creation of mathematical theories in the past, which have now become the focus of pure mathematics research, where abstract notions are researched for their own sake. As a result, applied mathematics is inextricably linked to pure mathematics study.

Divisions

The word "applied mathematics" now has a broader meaning. It encompasses both the traditional categories mentioned above as well as other areas that are becoming more relevant in applications. Even pure mathematics disciplines like number theory, which are not traditionally regarded to be part of the subject of applied mathematics per se, are now significant in applications (such as encryption).

There is no agreement on the definitions of the numerous fields of applied mathematics. The way mathematics and science evolve over time, as well as the way institutions structure departments, courses, and degrees, make such categorizations challenging.

Many mathematicians distinguish between "applied mathematics," which is concerned with mathematical procedures, and "applications of mathematics," which are concerned with applications of mathematics in science and engineering. Using a population model and applying existing mathematics is not the same as practicing applied mathematics; yet, mathematical biologists have posed questions that have sparked the expansion of pure mathematics. Poincaré and Arnold, for example, reject the concept of "applied mathematics," claiming that only "mathematical applications" exist. Non-mathematicians, likewise, combine applied mathematics with mathematical applications. "Industrial mathematics" refers to the application and development of mathematics to address industrial challenges.

Computational mathematics, computational science, and computational engineering, which employ high-performance computers to simulate phenomena and solve issues in the sciences and engineering, have emerged as a result of the success of current numerical mathematical methods and software. These are frequently seen as multidisciplinary.

Applicable mathematics

Although there is no consensus on a clear definition, the word applicable mathematics is sometimes used to distinguish between classical applied mathematics that emerged with physics and the numerous fields of mathematics that are applicable to real-world situations today. The phrase "applicable mathematics" is sometimes used to differentiate between conventional applied mathematics that arose with physics and the numerous fields of mathematics that are currently applicable to real-world situations.

On the one hand, mathematicians distinguish between "applied mathematics" and "applications of mathematics" or "applicable mathematics" both within and outside of science and engineering. Some mathematicians use the phrase "applicable mathematics" to distinguish between conventional applied domains and novel applications originating from topics formerly considered pure mathematics. For example, an ecologist or geographer employing population models and known mathematics would not be performing applied mathematics, but rather applicable mathematics.

Even pure mathematics disciplines like number theory, which are not traditionally regarded to be part of the subject of applied mathematics per se, are now significant in applications (such as encryption). Applicable mathematics can be viewed as a collection of mathematical methods, such as real analysis, linear algebra, mathematical modelling, optimisation, combinatorics, probability, and statistics, which are useful in fields other than traditional mathematics and are not limited to mathematical physics.