CONCEPT An integral is a mathematical concept that represents the area under a curve in a graph. It is a fundamental tool used to solve problems involving accumulation, such as finding the distance traveled by an object or the amount of material needed to fill a shape. Integrals can also be used to solve differential equations, which describe the relationship between a function and its derivatives. There are two types of integrals: definite integrals, represent a specific numerical value for the area under a curve between two points, and indefinite integrals, represent a family of functions that have the same derivative. The process of finding an integral is called integration, and it is the reverse of differentiation, which is the process of finding a derivative.

BACKGROUND

The development of calculus, and hence the modern concept of integrals, is attributed to Isaac Newton and Gottfried Wilhelm Leibniz in the 17th century. Newton developed the concept of fluxions, which later became known as derivatives, and used them to develop his method of fluxions for finding integrals. Leibniz independently developed a similar method, which he called the calculus, and also introduced the notation for integrals that is still used today. Over the centuries, the concept of integrals has been further developed, and several important techniques for evaluating integrals have been developed, including those developed by mathematicians such as Euler, Gauss, and Riemann.

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