

29 Lecture - MTH101

Important Subjective

What is the definite integral?

Answer: A definite integral is a mathematical tool used to calculate the area under a curve, as well as to find the net change of a quantity over a specified interval.

How is the definite integral represented?

Answer: The definite integral is represented by the symbol $\int_a^b f(x) dx$.

What is the difference between a definite integral and an indefinite integral?

Answer: A definite integral has limits of integration and gives a numerical value, while an indefinite integral does not have limits of integration and gives a family of functions.

What is the fundamental theorem of calculus?

Answer: The fundamental theorem of calculus states that the definite integral of a function $f(x)$ between two points a and b is equal to the difference of the antiderivative of $f(x)$ evaluated at b and a .

What is the relationship between the derivative and the definite integral?

Answer: The derivative of a function represents its rate of change, while the definite integral represents the accumulated change over a specified interval.

What is the Riemann sum?

Answer: The Riemann sum is a method for evaluating the definite integral by dividing the area under the curve into small rectangular strips of equal width and adding up the areas of all the rectangles.

What is numerical integration?

Answer: Numerical integration is a method for evaluating the definite integral using numerical methods to approximate the integral when it cannot be evaluated analytically.

What is the trapezoidal rule?

Answer: The trapezoidal rule is a numerical method for evaluating the definite integral by approximating the area under the curve using trapezoids instead of rectangles.

What are the real-world applications of the definite integral?

Answer: The definite integral has many real-world applications, such as in physics, engineering, economics, and finance.

How can the definite integral be used in finance?

Answer: The definite integral can be used in finance to calculate the present value of future cash flows.