A/L Combined Mathematics

Introduction To Calculus

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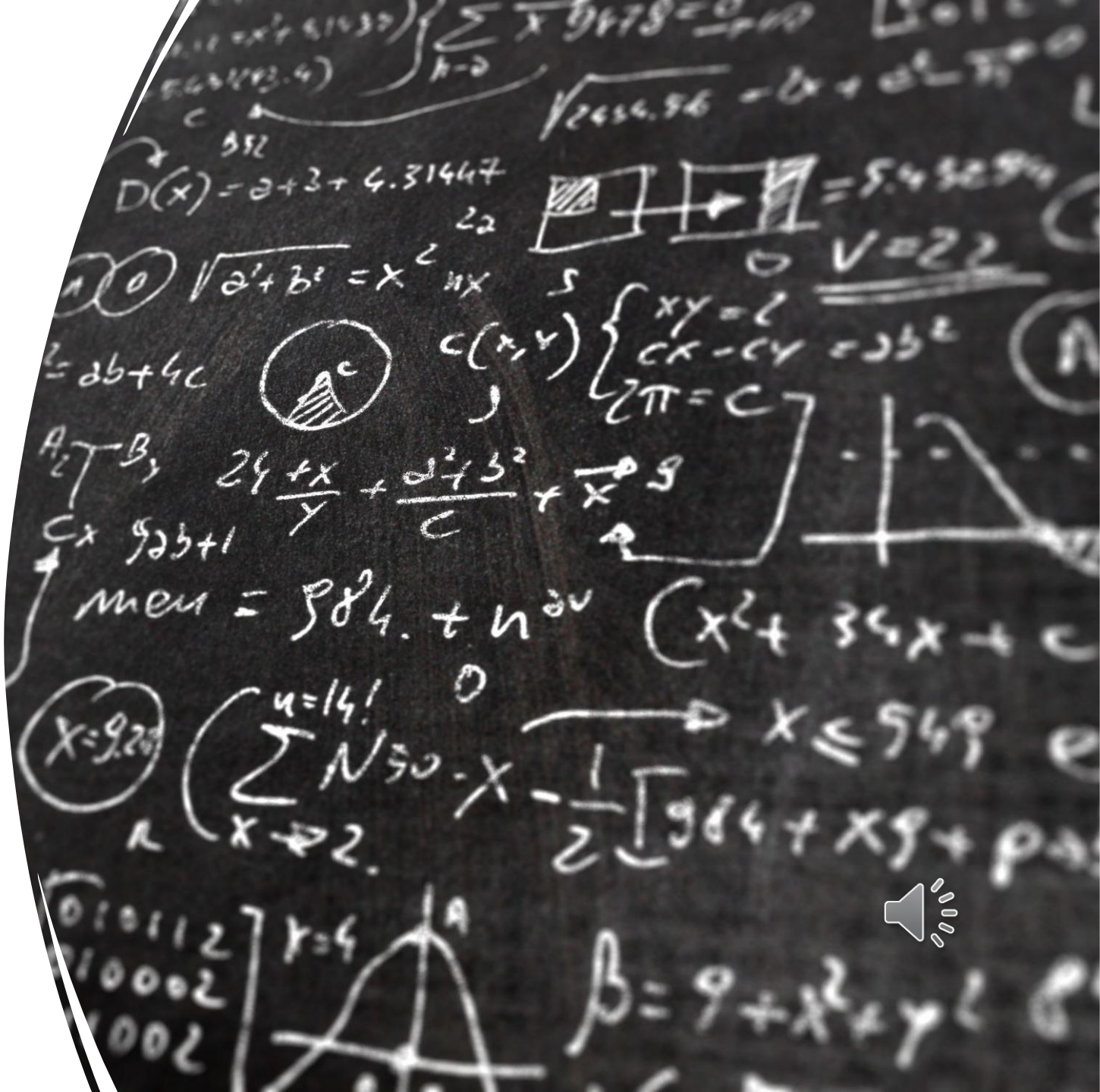
What is Calculus?

Calculus is a branch of mathematics that deals with the study of rates of change and the accumulation of quantities.

It provides a framework for understanding how things change.

It has two main branches:

Differential calculus
Integral calculus



Differential Calculus

Differential calculus is concerned with the concept of a derivative, which represents the rate at which a quantity changes.

The derivative of a function measures its instantaneous rate of change at a specific point.

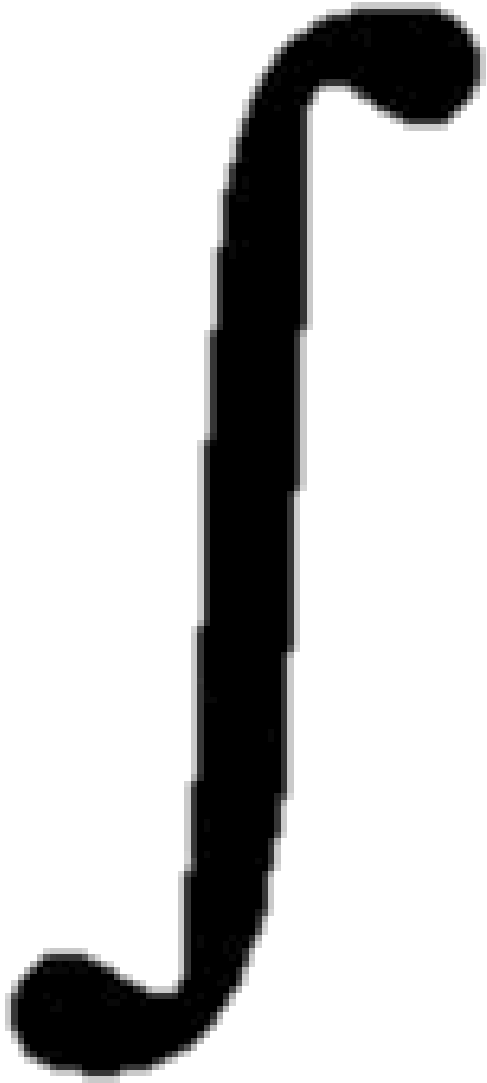
If y is a function of x, the derivative is denoted as dy/dx or f’(x).

Integral Calculus

Integral calculus focuses on the concept of integration, which represents the accumulation of quantities.

It deals with finding the integral of a function, which provides the area under a curve.

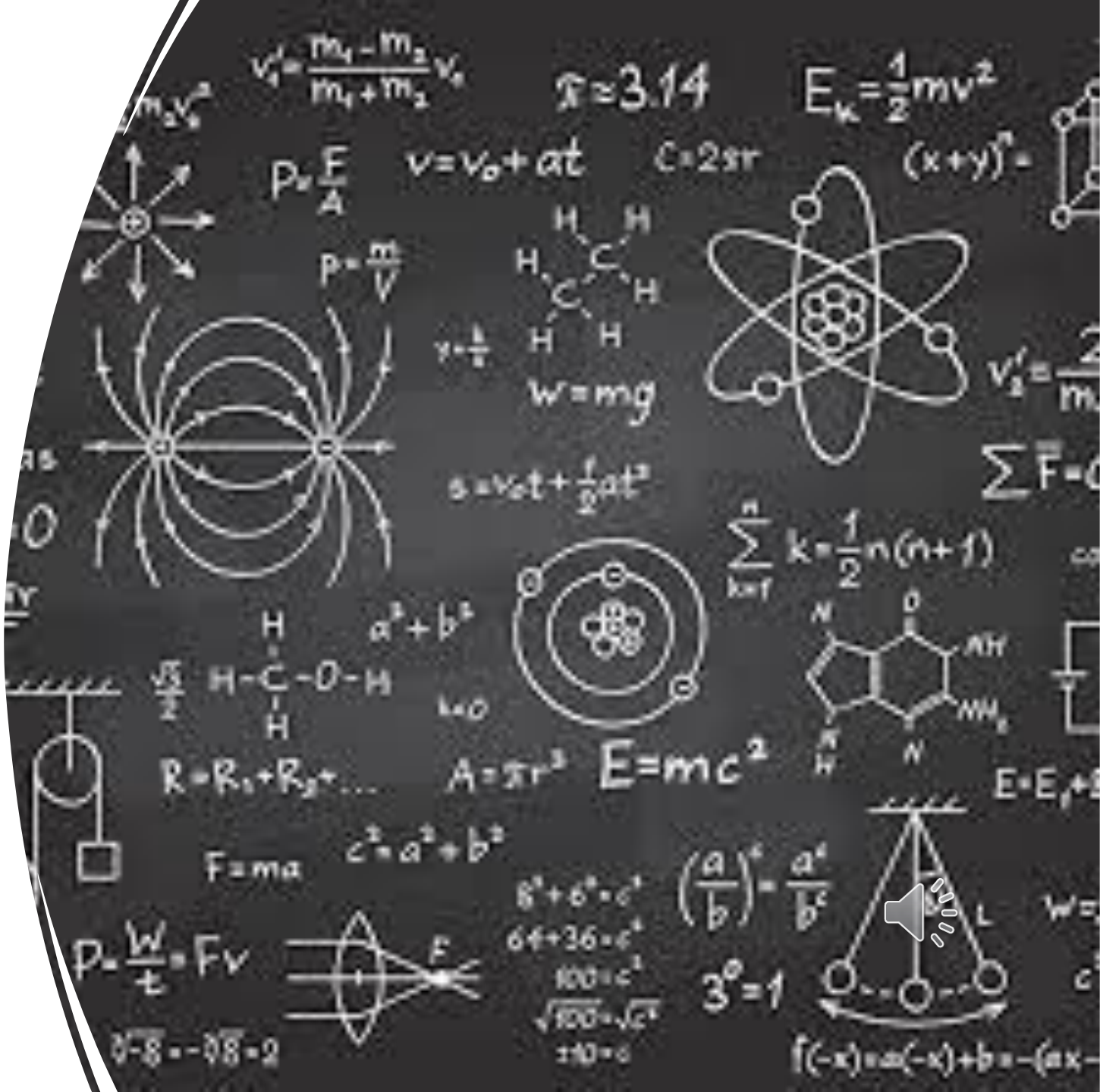
The integral of a function f(x) with respect to x is denoted as ∫f(x) dx.



Applications of Calculus

- **Physics**

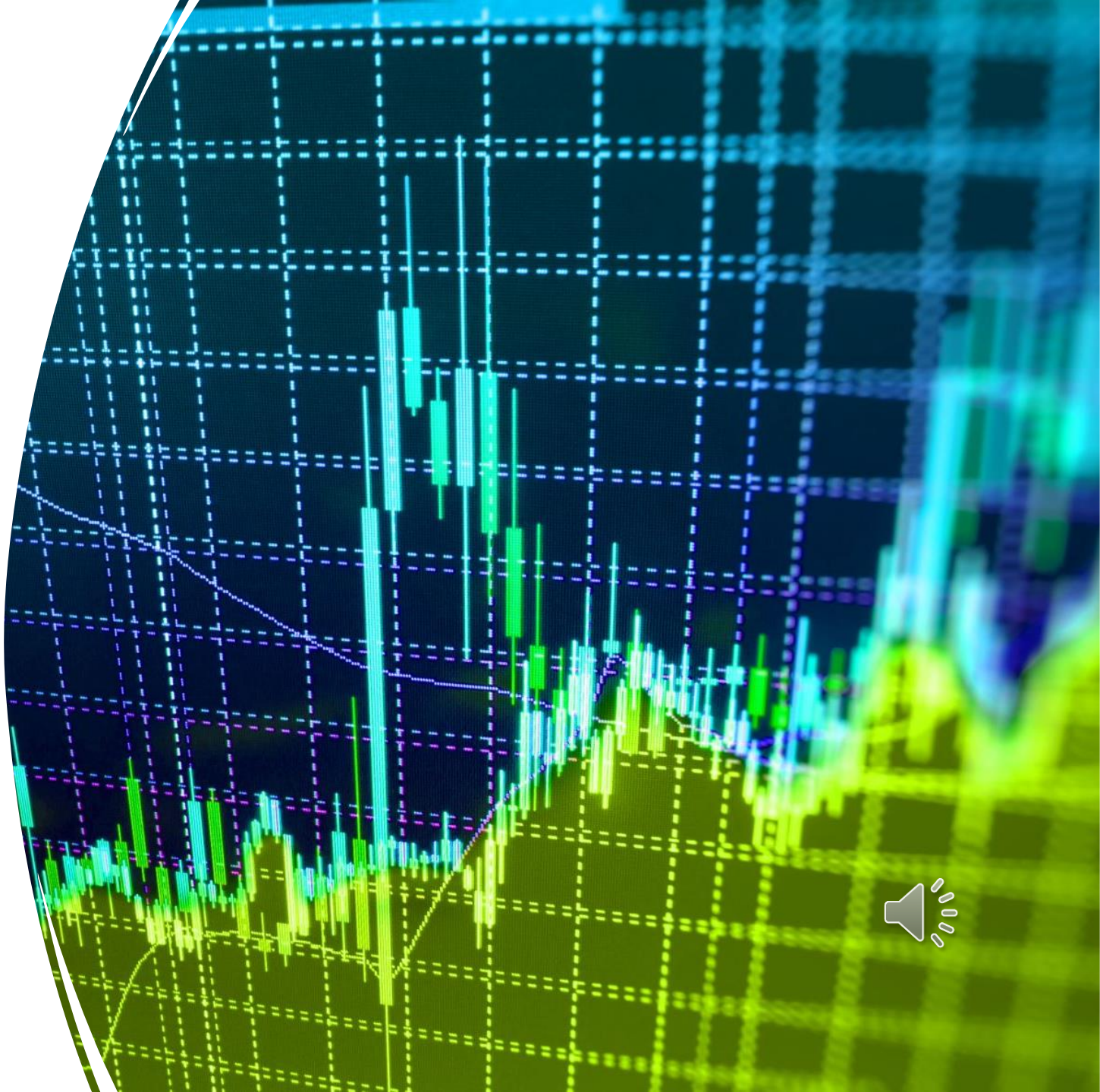
Calculus is crucial in describing the motion of objects, modeling forces, and understanding concepts like velocity and acceleration.



Applications of Calculus

- **Economics:**

Calculus helps to model and analyze various economic phenomena, such as supply and demand, production functions, and optimization problems.



Applications of Calculus

- **Engineering:**

Engineers use calculus for designing structures, analyzing systems, and solving problems related to fluid dynamics, heat transfer, and electrical circuits.

Applications of Calculus

- **Biology:**

Calculus is employed in modeling population growth, studying the kinetics of biochemical reactions, and understanding biological processes.

Covered Points:

- Definition of Calculus
- Differential Calculus
- Integral Calculus
- Applications of Calculus

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