Unit # 4: The Integral

Content Area: **Mathematics**
Course(s): **AP Calculus AB, AP Calculus BC**
Time Period: **Semester 2**
Length: **4 weeks**
Status: **Published**

Standards

MA.9-12.4.1.12 C.1	Recognize the limitations of estimation, assess the amount of error resulting from estimation, and determine whether the error is within acceptable tolerance limits.
MA.K-12.7	Look for and make use of structure.
MA.K-12.8	Look for and express regularity in repeated reasoning.

Enduring Understandings

The integral is a function that can be used to determine the summation of an infinite set.

Differentiation and definite integration are inverse operations.

The definite integral can be used to find exact area, volume, or length by using the limit of Riemann sums.

Essential Questions

What is a definite integral?

What does the integral tell us about a function?

How are Riemann sums used to define the definite integral?

How does area under a curve relate to the definite integral?

Knowledge and Skills

- Find the integral of a function over a given interval.
- Know what the integral of a function represents graphically.
- Understand the relationship between integration and differentiation.
- Use integration to find the position of an object given velocity or acceleration.
- Use integration to determine original amount based on a given rate.

Transfer Goals

Recognize and solve practical or theoretical problems involving mathematics, including those for which the solution approach is not obvious, by using mathematical reasoning and strategic thinking.

In this unit students will be able to identify the relationship between area and an integral. In this unit students will be able to analyze a given function to determine which of their various integration strategies to apply.

Resources

Calculus Graphical, Numerical, Algebraic by Finney

Online resources which include, but are not limited to: AP Classroom, Desmos, Class Kick, Delta Math, and Math XL.