Unit #4: Basic Integration

Content Area: **Mathematics**
Course(s): **Calculus A**
Time Period: **Semester 2**
Length: **6 weeks**
Status: **Published**

Standards

MA.F-IF.B.4	For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship.
MA.F-IF.C.7	Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.
MA.F-IF.C.7a	Graph linear and quadratic functions and show intercepts, maxima, and minima.
MA.F-IF.C.7b	Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions.

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 does the integral tell us about a function?

What is the relationship between integration and differentiation?

How can integration be used in "real world" situations such as finding the revenue for a company, or finding the position function of an object?

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 solve business problems (i.e. finding the revenue given marginal revenue).

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.

There is a strong connection between the visualization of data and the manipulation of symbols.

Resources

Calculus of a Single Variable (6th Edition)

Authors: Edwards, Hostetler, Larson

Sections: 4.1 - 4.3

Sections: 4.4 - 4.5

Graphing Calculator

www.desmos.com

https://www.edx.org/school/davidson-next

http://www.larsoncalculus.com/calc10/content/interactive-examples/