Unit # 5: Applied Integration

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

Standards

MA.K-12.1	Make sense of problems and persevere in solving them.
MA.K-12.4	Model with mathematics.
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.

Enduring Understandings

Integrals can be used to solve a variety of problems related to area, velocity, acceleration, volume, area of a surface of revolution, length of a curve, and work.

Connections between the area of a 2D plane with volume.

Essential Questions

How do we find the integral of a logarithmic, exponential or other trancendental function?

How do you find the area between two curves?

How can we determine the volume of a solid that is formed by revolving a 2-dimensional graph about an axis of revolution?

How can we find the volume of a cross-section formed between two curves given the cross-section is a known geometric shape?

How can we use L'Hopital's Rule to help evalute limits?

Knowledge and Skills

- Find the integral of logarithmic, exponential and other trancendental functions.
- Find the area between two curves.
- Determine the volume of a solid formed by revolving a 2-dimensional graph about an axis of revolution.

- 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.

There is a connection between a cross section and a 3D object. This can be used for 3D printing and woodworking.

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.