Acc Calculus Unit 3 Differentiation

Content Area: **Math**
Course(s): **Accelerated Calculus**
Time Period: **Marking Period 2**
Length: **8 weeks**
Status: **Published**

Unit Overview

In this unit, we introduce interpretations of the derivative, consider the derivative as a function, and consider some properties of the derivative. We will develop a collection of basic derivative formulas and rules that we will use throughout our study of calculus. We will explore the Chain Rule, which allows us to differentiate composite functions and provides the means to establish derivative formulas for exponential and logarithmic functions. We will also use the derivative to solve problems involving rates of change of variables that are related.

Enduring Understandings

- The derivative of a function is defined as the limit of a difference quotient and can be determined using a variety of strategies.
- The derivative has multiple interpretations and applications including those that involve instantaneous rates of change.

Essential Questions

- What is the derivative and what is its relationship to continuity?
- How do you find the derivatives of basic algebraic functions, trigonometric functions, and exponential functions?
- How do you find the derivatives of functions involving products and quotients?
- How do you find the derivatives of composite functions, natural logarithmic functions, and exponential functions?
- How do you find the derivative of implicitly defined functions?
- How do you find the derivatives of inverse functions?
- What is a related rate and how do you find it?

New Jersey Student Learning Standards (No CCS)

N/A

Interdisciplinary Connections

LA.W.9-10.6	Use technology, including the Internet, to produce, share, and update individual or shared writing products, taking advantage of technology's capacity to link to other information and to display information flexibly and dynamically.
SCI.HS-ETS1-2	Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.
TECH.8.1.12.C.CS4	Contribute to project teams to produce original works or solve problems.

Technology Standards

TECH.8.1.12.C.CS4	Contribute to project teams to produce original works or solve problems.
TECH.8.1.12.D.CS3	Exhibit leadership for digital citizenship.
TECH.8.1.12.E.CS4	Process data and report results.
TECH.8.1.12.F.CS3	Collect and analyze data to identify solutions and/or make informed decisions.
TECH.8.1.12.F.CS4	Use multiple processes and diverse perspectives to explore alternative solutions.
TECH.8.2.12.C.CS2	The application of engineering design.

21st Century Themes/Careers

CAEP.9.2.12.C.3	Identify transferable career skills and design alternate career plans.

Financial Literacy Integration

PFL.9.1.12.C.1	Compare and contrast the financial benefits of different products and services offered by a variety of financial institutions.
PFL.9.1.12.C.2	Compare and compute interest and compound interest and develop an amortization table using business tools.
PFL.9.1.12.C.3	Compute and assess the accumulating effect of interest paid over time when using a variety of sources of credit.