Acc Calculus Unit 4 Applications of Differentiation

Content Area: **Math**
Course(s): **Accelerated Calculus**
Time Period: **Marking Period 2**
Length: **5 weeks**
Status: **Published**

Unit Overview

In this unit, we will continue to explore applications of the derivative. We will use the derivative to find optimal (minimum or maximum) values of functions, and to investigate properties of the graph of a function.

Enduring Understandings

- A function's derivative, which is itself a function, can be used to understand the behavior of the function.
- The derivative has multiple interpretations and applications including those that involve instantaneous rates of change.
- The mean value theorem connects the behavior of a differentiable function over an interval to the behavior of the derivative of that function at a particular point in the interval.

Essential Questions

- What are extrema and how can you find them on open and closed intervals?
- What is the mean value theorem and how is it used?
- How can you determine the intervals on which a function is increasing or decreasing and the location of the function's relative extrema?
- How do you determine the concavity of a function and find its inflection points?
- How do you analyze a function and sketch its graph?
- How do you maximize or minimize quantities?

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.