Marietta City Schools

2024–2025 District Unit Planner

AP Calculus AB

Unit title	**Unit 3: Differentiation: Composite, Implicit, and Inverse Function**	**Unit duration (hours)**	**7.5 - 10 hours**

Mastering Content and Skills through INQUIRY (Establishing the purpose of the Unit): ***What will students learn?***

GA DoE Standards

Standards

3.1 The chain rule
3.2 Implicit differentiation
3.3 Differentiation inverse functions
3.4 Differentiation inverse trigonometric functions
3.5 Selecting procedures for calculating derivatives
3.6 Calculative higher order derivatives

Concepts/Skills to support mastery of standards

- Chain rule
- Implicit Differentiation
- Differentiating Inverse Functions
- Differentiation of Inverse Trig Function
- Selecting procedures for calculating derivatives
- Calculating higher order derivatives

Vocabulary

Composite function, chain rule, implicit differentiation, inverse functions, higher order derivatives

Notation

$y = f(u),\ u = g(x),\ f^{-1}(x),\ (f^{-1})'(x)\ ,\ arcsin(x),\ sin^{-1}(x)$

Higher-order derivatives are represented with a variety of notations. For $y = f(x)$, notations for the second derivative include $\frac{d^2y}{dx^2}$, $f''(x)$, and y''. Higher-order derivatives can be denoted $\frac{d^n y}{dx^n}$ or $f^{(n)}(x)$.

Essential Questions

How do we find derivatives of composite and inverse functions?
How can we take the derivative of a function that is not explicitly solved for a single variable?
How do you decide which derivative rules to utilize?
How can we explore the relationship between a function and its first and second derivatives?

Assessment Tasks

List of common formative and summative assessments.

Formative Assessment(s):

Skills checks, HW, quizzes

Summative Assessment(s):

Unit Test

Learning Experiences

Add additional rows below as needed.		
Objective or Content	**Learning Experiences**	**Personalized Learning and Differentiation**
3.1 The chain rule	Round Table 1. Factual recall 2. Carry out a procedure 3. Classify a mathematical object 4. Prove, show, justify 5. Extend a concept 6. Critique a fallacy In groups of four, each student has an identical paper with four different problems on it. Students co problem on their paper and then pass the paper clockwise to another member in their group. That s first problem and then completes the second problem on the paper. Students rotate again and the p each student has their own paper back.	Collaborative groups Technology: desmos, graphing calculators, if desired.
Content Resources		
● AP Classroom (within AP Central, collegeboard.org) ● Calculus textbook: Calculus, 11e, Larson & Edwards ● Khan Academy ● Delta Math ● flippedmath.com ● Teacher created resources		