



Differentiation Checklist

Achievement

I can:

- Find the derivative of basic functions like polynomials, exponentials, and trigonometric functions
- Identify critical points of a function by setting the derivative equal to zero
- Determine whether a critical point is a local maximum, local minimum, or point of inflection using the sign of the first derivative
- Solve simple optimization problems by finding the maximum or minimum value of a function
- Communicate solutions using appropriate mathematical notation and terminology

Merit

I can

- Apply advanced differentiation rules like the chain rule, product rule, and quotient rule to find derivatives of composite functions
- Solve related rates of change problems by using the derivative to find the rate of change of one quantity with respect to another
- Find the equation of the normal line to a curve at a given point
- Demonstrate conceptual understanding by connecting the derivatives and their meaning to the context of the problem
- Communicate mathematical reasoning in a clear and organized manner

Excellence

I can:

- Devise problem-solving strategies to tackle challenging, multi-step problems involving differentiation
- Identify the most appropriate differentiation techniques to apply based on the nature of the problem
- Develop logically sound chains of reasoning to solve problems, including proofs and justifications
- Form generalizations about the behavior of functions and their derivatives
- Communicate mathematical insights and solutions precisely using correct notation and clear explanations