



## Apply Differentiation Methods Solving Problems

Achieved	Merit	Excellence
Apply differentiation methods in solving problems.	Apply differentiation methods, using <u>relational thinking</u> , in solving problems.	Apply differentiation methods, using <u>extended abstract thinking</u> , in solving problems.
<u>Relational Thinking</u> - Involves selecting and carrying out a logical sequence of steps, connecting different concepts or representations, demonstrating understanding of concepts, and relating findings to a context.		
<u>Extended Abstract Thinking</u> - Involves devising a strategy, identifying relevant concepts, developing logical reasoning, forming generalizations, and communicating mathematical insight.		

### Differentiation Methods

The methods included in this standard are related to:

- Derivatives of power, exponential, trigonometric (including reciprocal) and logarithmic (base e only) functions
- Optimization
- Equations of normals
- Maxima and minima and points of inflection
- Related rates of change
- Derivatives of parametric functions
- Chain, product, and quotient rules
- Properties of graphs (limits, differentiability, continuity, concavity)

### Problems

Situations set in real-life or mathematical contexts that provide opportunities to apply knowledge and understanding of differentiation methods

### Key Vocabulary

Students are expected to understand and use terms related to differentiation methods, such as:

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|--|--|--|
| <input type="checkbox"/> Derivative        | <input type="checkbox"/> Optimization        | <input type="checkbox"/> Related rates of change |
| <input type="checkbox"/> Limit             | <input type="checkbox"/> Normal              | <input type="checkbox"/> Parametric function     |
| <input type="checkbox"/> Differentiability | <input type="checkbox"/> Maxima              | <input type="checkbox"/> Chain rule              |
| <input type="checkbox"/> Continuity        | <input type="checkbox"/> Minima              | <input type="checkbox"/> Product rule            |
| <input type="checkbox"/> Concavity         | <input type="checkbox"/> Point of inflection | <input type="checkbox"/> Quotient rule           |