Unit 3: Applying Properties of Derivatives MVC4U

Lesson Outline

Big Picture

Students will:

- investigate using technology the key features of the graph of the function and those of the first and second derivatives;
- connect the key properties of the second derivative to the first derivative and the original polynomial or rational function;
- determine algebraically the equation of the second derivative of a polynomial or simple rational function;
- sketch and verify graphs of polynomial functions from given key features.

Day	Lesson Title	Math Learning Goals	Expectations
1–3	The Second Derivative *(lessons not included)*	• Define the second derivative. • Investigate using technology to connect the key properties of the second derivative to the first derivative and the original polynomial or rational function (increasing and decreasing intervals, local maximum and minimum, concavity and point of inflection). • Determine algebraically the equation of the second derivative $f\,(x)$ of a polynomial or simple rational function $f\,(x)$, and make connections, through investigation using technology, between the key features of the graph of the function and those of the first and second derivatives.	B1.1, B1.2, B1.3
4	Curve Sketching from Information *(lesson not included)*	• Describe key features of a polynomial function and sketch two or more possible graphs of a polynomial function given information from first and second derivatives – explain why multiple graphs are possible.	B1.4
5–6	Curve Sketching from an Equation *(lessons not included)*	• Extract information about a polynomial function from its equation, and from the first and second derivative to determine the key features of its graph. • Organize the information about the key features to sketch the graph and use technology to verify.	B1.5
7	Jazz Day		
8	Unit Summative		