Enduring Understandings	Learning Objectives	Essential Knowledge
(Students will understand that...)	(Students will be able to...)	(Students will know that...)
EU 2.1: The derivative of a function is defined as the limit of a difference quotient and can be determined using a variety of strategies.	**LO 2.1A:** Identify the derivative function as the limit of a difference quotient.	**EK 2.1A1:** The difference quotients $\frac{f(a+h)-f(a)}{h}$ and $\frac{f(x)-f(a)}{x-a}$ express the average rate of change of a function over an interval. **EK 2.1A2:** The instantaneous rate of change of a function at a point can be expressed by $\lim_{h \to 0} \frac{f(a+h)-f(a)}{h}$ or $\lim_{x \to a} \frac{f(x)-f(a)}{x-a}$, provided that the limit exists. These are common forms of the definition of the derivative and are denoted $f'(a)$. **EK 2.1A3:** The derivative of f is the function whose value at x is $\lim_{h \to 0} \frac{f(x+h)-f(x)}{h}$ provided this limit exists. **EK 2.1A4:** For $y = f(x)$, notations for the derivative include $\frac{dy}{dx}$, $f\,'(x)$, and y'. **EK 2.1A5:** The derivative can be represented graphically, numerically, analytically, and verbally.
	LO 2.1C: Calculate derivatives.	**EK 2.1C1:** Direct application of the definition of the derivative can be used to find the derivative for selected functions, including polynomial, power, sine, cosine, exponential, and logarithmic functions.
EU 2.2: A function's derivative, which is itself a function, can be used to understand the behavior of the function.	**LO 2.2B:** Recognize the connection between differentiability and continuity.	**EK 2.2B1:** A continuous function may fail to be differentiable at a point in its domain. **EK 2.2B2:** If a function is differentiable at a point, then it is continuous at that point.

EU 2.3: The derivative has multiple interpretations and applications including those that involve instantaneous rates of change.	**LO 2.3A:** Interpret the meaning of a derivative within a problem.	**EK 2.3A2:** The derivative of a function can be interpreted as the instantaneous rate of change with respect to its independent variable.
	LO 2.3B: Solve problems involving the slope of a tangent line.	**EK 2.3B1:** The derivative at a point is the slope of the line tangent to a graph at that point on the graph. **EK 2.3B2:** The tangent line is the graph of a locally linear approximation of the function near the point of tangency.