

Derivatives

Instructional Focus	4 – Mastery	3 – Proficient	2 - Basic	1 – Below Basic	0 – No Evidence
<p>Calculating derivatives. (CHA-2.C, FUN-2.A, FUN-3.A, FUN-3.B, FUN-3.F, CHA-3.F, LIM-4.A)</p> <p>Estimating derivatives. (CHA-2.D)</p>	<p>Can Extend thinking beyond the standard, including tasks that may involve one of the following:</p> <ul style="list-style-type: none"> • Designing • Connecting • Synthesizing • Applying • Justifying • Critiquing • Analyzing • Creating • Proving 	<p>Calculate and estimate the derivative (including higher order) for all of the following functions:</p> <ul style="list-style-type: none"> • Polynomials • Rational • Exponential • Logarithm • Trigonometric • Trigonometric Inverse • Piecewise <p>Calculate derivatives using all of the following rules:</p> <ul style="list-style-type: none"> • Sum/Differences • Products • Quotients • Power <p>(with proper notation)</p> <p>Evaluate limits of a function using L'Hospital's Rule more than once.</p> <p>Follows math practices of algebraic computation, precision and reasoning*</p>	<p>Calculate and estimate the derivative (including higher order) for all of the following functions:</p> <ul style="list-style-type: none"> • Polynomials • Rational • Exponential • Logarithm • Trigonometric • Trigonometric Inverse • Piecewise <p>Calculate derivatives using three of the following rules:</p> <ul style="list-style-type: none"> • Sum/Differences • Products • Quotients • Power <p>(with proper notation)</p> <p>Evaluate limits of a function using L'Hospital's Rule once.</p>	<p>Calculate and estimate the derivative (including higher order) for all of the following functions:</p> <ul style="list-style-type: none"> • Polynomials • Rational • Exponential • Logarithm • Trigonometric • Trigonometric Inverse • Piecewise <p>Calculate derivatives using two of the following rules:</p> <ul style="list-style-type: none"> • Sum/Differences • Products • Quotients • Power <p>(with proper notation)</p> <p>Identify if the limit of a function is an indeterminate form.</p>	<p>Little evidence of reasoning or application to solve the problem</p> <p>Does not meet the criteria in a level 1</p>
<p>Calculate derivatives using chain rule (FUN-3.C, FUN-3.D, FUN-3.E, FUN-3.F)</p>		<p>Using chain rule, calculate derivative (including higher order) for composite functions, inverses, and implicit differentiation (with proper notation)</p> <p>Follows math practices of algebraic computation, precision and reasoning*</p>	<p>Using chain rule, calculate derivative (including higher order) for composite functions, and inverses or implicit differentiation (with proper notation)</p>	<p>Using chain rule, calculate derivative (including higher order) for composite functions (with proper notation)</p>	
<p>Apply the Mean Value Theorem to describe the behavior of a function over an interval. (FUN-1.B)</p>		<p>Given a function and an interval, calculate BOTH of the following:</p> <ul style="list-style-type: none"> • Average rate of change of the function • Instantaneous rate of change of the function <p>AND</p> <p>Apply the Mean Value Theorem</p> <p>Follows math practices of algebraic computation, precision and reasoning*</p>	<p>Given a function and an interval, calculate BOTH of the following:</p> <ul style="list-style-type: none"> • Average rate of change of the function • Instantaneous rate of change of the function 	<p>Given a function and an interval, calculate ONE of the following:</p> <ul style="list-style-type: none"> • Average rate of change of the function • Instantaneous rate of change of the function 	

*Math Practices for AP Calculus include:

- Algebraic processes and computations completed logically and correctly
- Attend to precision graphically, numerically and analytically
- Clearly present reasoning and justification with accurate and precise language