

HPISD Curriculum: Pre Calculus Pre-AP

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Title	Estimated Duration	6 Weeks					
Unit 14: Introduction to Calculus	11 days	1	2	3	4	5	6
Unit Overview							
Introduction to Calculus							
Generalizations/Enduring Understandings							
The student will understand that:	<ul style="list-style-type: none"> • A limit is the y-value of the function as x approaches a number c, or as x approaches \pm infinity. • Derivatives can be used to find the slope of a tangent line. • The area under a curve can be approximated by a technique that uses rectangles. 						
Concepts	Guiding/Essential Questions						
<ul style="list-style-type: none"> • Limits • Derivative • Area Under a Curve 	<ul style="list-style-type: none"> • What determines if a function is continuous? • How do one-sided limits relate to the full limit? • How is a derivative found? 						
Learning Targets							
<ul style="list-style-type: none"> • Students will investigate and solve limits graphically, algebraically, and numerically. • Students will use the definition of the derivative to find a derivative. • Students will use rectangles to approximate the area under a curve. 							
Formative Assessments				Summative Assessments			

TEKS:	Processes and Skills: What students should be able to DO	Facts: What students should KNOW
<p>Determine and analyze the key features of exponential, logarithmic, rational, polynomial, power, trigonometric, inverse trigonometric, and piecewise defined functions, including step functions such as domain, range, symmetry, relative maximum, relative minimum, zeros, asymptotes, and intervals over which the function is increasing or decreasing. P.2.I</p> <p>Analyze and describe end behavior of functions, including exponential, logarithmic, rational, polynomial, and power functions using infinity notation to communicate this characteristic in mathematical and real-world problems. P.2.J</p> <p>Determine various types of discontinuities in the interval $(-\infty, \infty)$ as they relate to functions such as rational and piecewise defined functions and explore the limitations of the graphing calculator as it relates to the behavior of the function around discontinuities. P.2.L</p> <p>Describe the left-sided behavior and the right-sided behavior of the graph of a function around discontinuities. P.2.M</p>	<ul style="list-style-type: none"> • Determine if a function is continuous. • Solve limits graphically, algebraically and numerically. • Find a derivative using the definition of the derivative. • Use rectangles to approximate the area under a curve. 	<ul style="list-style-type: none"> • Types of discontinuities; jump, infinite, and removable. • Difference between one-sided limits and the full limit. • Rectangles used to approximate area under a curve is called a Riemann sum.
Topics		
Introduction to Calculus		
Language of Instruction		
continuous function discontinuities (infinite, jump & removable)	derivative limit limit	Riemann sum tangent line
State Assessment Connections		National Assessment Connections
Resources		

