

Calculus Scope & Sequence

Unit 1 Preview of Calculus

Objectives SWBAT:	Learning Objectives	Essential Knowledge
<ul style="list-style-type: none"> Explore the instantaneous rate of change of a function Find average rates using two points very close together to estimate instantaneous rates of change 	LO2.1A LO2.1B LO2.3A	EK2.1A1, EK2.1A2, EK2.1A5, EK2.1B1 EK2.3A1, EK2.3A2
<ul style="list-style-type: none"> Recall graphs of familiar functions Use tangent lines to determine how fast a function is changing at a point 	LO2.3B	EK2.3B1
<ul style="list-style-type: none"> Discover what a definite integral is Estimate a definite integral by approximating area under the curve 	LO3.2B	EK3.2B1
<ul style="list-style-type: none"> Estimate definite integrals using trapezoidal sums 	LO3.2B	EK3.2B2

Unit 2 Limits and Continuity

Objectives SWBAT:	Learning Objectives	Essential Knowledge
<ul style="list-style-type: none"> Find and compare average and instantaneous rates of change Define limits and use proper notation Find limits using direct substitution, tables, and graphs 	LO1.1A(a) and (b) LO1.1B LO1.1C	EK1.1A1 EK1.1A3 EK1.1B1 EK1.1C1, EK1.1C2
<ul style="list-style-type: none"> Find one-sided and two-sided limits 	LO1.1A(a) and (b)	EK1.1A2, EK1.1A3, EK1.1B1
<ul style="list-style-type: none"> Find limits of piecewise functions without graphs Identify horizontal and vertical asymptotes 	LO1.1C LO1.1D	EK1.1C1, EK1.1C2, EK1.1D1
<ul style="list-style-type: none"> Use the formal definition of continuity Identify points of discontinuity and type 	LO1.2A1	EK1.2A1, EK1.2A2, EK1.2A3
<ul style="list-style-type: none"> Find average and instantaneous rates of change Find the equations of tangent and normal lines 	LO2.1A LO2.3B	EK2.1A1, EK2.1A2 EK2.3B1

Unit 3 Derivatives

Objectives SWBAT:	Learning Objectives	Essential Knowledge
<ul style="list-style-type: none"> Find derivatives as the limit of the difference quotient or the alternate difference quotient Use proper derivative notation 	LO2.1A LO2.1C	EK2.1A2, EK2.1A3, EK2.1A4, EK2.1A5, EK2.1C1
<ul style="list-style-type: none"> Determine where and why a function is not differentiable Connect differentiability and continuity 	LO2.2B	EK2.2B1, EK2.2B2
<ul style="list-style-type: none"> Find derivatives using the constant and power rules Find derivatives using the product and quotient rules Find higher-order derivatives 	LO2.1C LO2.1D	EK2.1C2 EK2.1C4 EK2.1D1, EK2.1D2
<ul style="list-style-type: none"> Use derivatives to solve rectilinear motion problems involving speed, velocity, and acceleration 	LO2.3C	EK2.3C1
<ul style="list-style-type: none"> Find derivatives of trigonometric functions 	LO2.1C	EK2.1C2
<ul style="list-style-type: none"> Use the Chain Rule to differentiate composite functions 	LO2.1C	EK2.1C4, EK2.1C3
<ul style="list-style-type: none"> Use implicit differentiation to find derivatives of 	LO2.1C	EK2.1C5, EK2.1C3

implicitly defined functions		
<ul style="list-style-type: none"> Find derivatives of inverse trigonometric functions 	LO2.1C	EK2.1C2, EK2.1C3
<ul style="list-style-type: none"> Find derivatives of exponential and logarithmic functions Find derivatives of inverse functions 	LO2.1C	EK2.1C2 EK2.1C3 EK2.1C6

Unit 4 Applications of Derivatives

Objectives SWBAT:	Learning Objectives	Essential Knowledge
<ul style="list-style-type: none"> Find extreme values of functions on closed intervals using the Extreme Value Theorem 	LO1.2B, LO2.2A	EK1.2B1, EK2.2A1
<ul style="list-style-type: none"> Find values guaranteed by the Mean Value Theorem 	LO1.2B	EK1.2B1
<ul style="list-style-type: none"> Find intervals of increase and decrease Use the First Derivative Test to determine extrema 	LO2.2A	EK2.2A1 EK2.2A2
<ul style="list-style-type: none"> Find concavity of a function Use the Second Derivative Test to determine extrema 	LO2.2A	EK2.2A1 EK2.2A2
<ul style="list-style-type: none"> Use the graphs of f, f', and f'' to describe characteristics of each other 	LO2.2A	EK2.2A2 EK2.2A3
<ul style="list-style-type: none"> Solve optimization problems 	LO2.3C	EK2.3C3
<ul style="list-style-type: none"> Estimate values of functions using local linearity 	LO2.3B	EK2.3B2
<ul style="list-style-type: none"> Solve Related Rates word problems 	LO2.3A, LO2.3C	EK2.3A1, EK2.3A2, EK2.3C2