

**Title** AP Calculus AB/BC

<b>Unit:</b>		<b>Limits</b>					
<b>Big Ideas:</b>		CHA, LIM , FUN					
<b>Unit Essential Questions:</b>		Can change occur at an instant? How does knowing the value of a limit, or that a limit does not exist, help you to make sense of interesting features of functions and their graphs? How do we close loopholes so that a conclusion about a function is always true?					
<b>Concept &amp; Pacing</b>	<b>Pa Core Standard</b>	<b>Key Vocabulary</b>	<b>Essential Questions</b>	<b>Competencies (skills, knowledge, abilities)</b>	<b>Mini-Lessons/Activities</b>	<b>Instructional Materials</b>	<b>Assessments</b>
Introduction 1 day		Rate of change Area under a curve	Can change occur at an instant?	Solving basic calculus problems using algebraic skills.	Lecture (video if needed) Example problems Practice Problems	Master Math Mentor packet Videos for lessons	Quiz
2 Tangent Lines 2 days		Tangent Lines	How can graphs be used to determine rates of change?	Using a graphing device to find tangent lines to curves.	Lecture (video if needed) Example problems Practice Problems	Master Math Mentor packet Videos for lessons	Homework Quiz
3 Average and Instantaneous Rates of Change 2 days		Secant Lines AROC IROC Difference quotient Average Velocity Instantaneous Velocity	How are rates of change determined?	Calculate instantaneous and average rates of change.	Lecture (video if needed) Example problems Practice Problems	Master Math Mentor packet Videos for lessons	Homework Quiz
4 Graphical Approach to Limits 2 days		limit asymptote	How can reasoning with definitions and properties be used to justify claims about limits?	Determine the limits of functions using limit theorems. Interpret the behavior of functions using limits involving infinity.	Lecture (video if needed) Example problems Practice Problems	Master Math Mentor packet Videos for lessons	Homework Quiz
5 Algebraic Approach to Limits 2 days		indeterminate	How can reasoning with definitions and properties be used to justify claims about limits?	Determine the limits of functions using limit theorems. Interpret the behavior of functions using limits involving infinity.	Lecture (video if needed) Example problems Practice Problems	Master Math Mentor packet Videos for lessons	Homework Quiz AP problem
6-7 Definition of Derivative 3 days			How can reasoning with definitions and properties be used to justify claims about limits?	Represent the derivative of a function as the limit of a difference quotient. Determine the equation of a line tangent to a curve at a given point.	Lecture (video if needed) Example problems Practice Problems	Master Math Mentor packet Videos for lessons	Homework
Review and Tests 4 days							

16 days

**Title** AP Calculus AB/BC

<b>Unit:</b>		<b>Differentiation: Definition, Fundamental Properties, Composite, Implicit, and Inverse Functions</b>					
<b>Big Ideas:</b>		CHA, LIM, FUN					
<b>Unit Essential Questions:</b>		Why do mathematical properties and rules for simplifying and evaluating limits apply to differentiation? What rules are used to determine derivatives?					
<b>Concept &amp; Pacing</b>	<b>Pa Core Standard</b>	<b>Key Vocabulary</b>	<b>Essential Questions</b>	<b>Competencies (skills, knowledge, abilities)</b>	<b>Mini-Lessons/Activities</b>	<b>Instructional Materials</b>	<b>Assessments</b>
8 Techniques of Differentiation 4 days		Constant Rule Single variable Rule Power Rule Constant Multiple Rule Sum/Difference Rule Product Rule Quotient Rule	What derivative rules should be applied in various situations?	Recognizing opportunities to apply derivative rules can simplify differentiation. Apply the concept of derivative to mathematical situations.	Lecture (video if needed) Example problems Practice Problems	Master Math Mentor packet Videos for lessons	Homework Test
9 Chain Rule 2 days		Chain Rule	What derivative rules should be applied in various situations?	Recognizing opportunities to apply derivative rules can simplify differentiation. Apply the concept of derivative to mathematical situations.	Lecture (video if needed) Example problems Practice Problems	Master Math Mentor packet Videos for lessons	Homework Quiz Test AP problem
10 Differentiation of Trig Functions 2 days		Sine Cosine Tangent Cosecant Secant Cotangent	What derivative rules should be applied in various situations?	Recognizing opportunities to apply derivative rules can simplify differentiation. Apply the concept of derivative to mathematical situations.	Lecture (video if needed) Example problems Practice Problems	Master Math Mentor packet Videos for lessons	Homework Test
11 Implicit Differentiation 2 days		Explicit Differentiation Implicit Differentiation	What derivative rules should be applied in various situations?	Recognizing opportunities to apply derivative rules can simplify differentiation. Apply the concept of derivative to mathematical situations.	Lecture (video if needed) Example problems Practice Problems	Master Math Mentor packet Videos for lessons	Homework Test
12 Derivatives of Transcendental Functions 2 days		Transcendental Natural Log Logarithmic Differentiation Euler's Number	What derivative rules should be applied in various situations?	Recognizing opportunities to apply derivative rules can simplify differentiation. Apply the concept of derivative to mathematical situations.	Lecture (video if needed) Example problems Practice Problems	Master Math Mentor packet Videos for lessons	Homework Test
13 Derivatives of Inverse Functions 2 days		Inverse Functions	What derivative rules should be applied in various situations?	Recognizing opportunities to apply derivative rules can simplify differentiation. Apply the concept of derivative to mathematical situations.	Lecture (video if needed) Example problems Practice Problems	Master Math Mentor packet Videos for lessons	Homework AP problem
14 Linear Approximations 2 days		Linear Approximation	How is the concept of derivative used to approximate values?	Derivatives allow us to solve real-world problems involving rates of change.	Lecture (video if needed) Example problems Practice Problems	Master Math Mentor packet Videos for lessons	Homework AP Problem
15 Continuity and Differentiability		Continuity of a Function	What definitions, theorems, and	Justify conclusions about continuity at a point using the definition.	Lecture (video if needed) Example problems	Master Math Mentor packet Videos for lessons	Homework Quiz

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2 days		Continuous Function Step Discontinuity Removable Discontinuity Differentiability Cusp Corner	properties can be used to justify claims about continuity?	Determine intervals over which a function is continuous. Determine values of $x$ or solve for parameters that make discontinuous functions continuous, if possible.	Practice Problems		
Review and Tests 7 days							

25 days

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<b>Unit:</b>		<b>Contextual and Analytical Applications of Differentiation</b>					
<b>Big Ideas:</b>		CHA, LIM, FUN					
<b>Unit Essential Questions:</b>		How can the application of mathematical theorems and properties help mathematical evaluations of equations and graphs? How can real-world situations be evaluated and solved through the application of Calculus principles?					
<b>Concept &amp; Pacing</b>	<b>Pa Core Standard</b>	<b>Key Vocabulary</b>	<b>Essential Questions</b>	<b>Competencies (skills, knowledge, abilities)</b>	<b>Mini-Lessons/Activities</b>	<b>Instructional Materials</b>	<b>Assessments</b>
16 Related Rates 2 days		Related Rates Law of Cosines	How can real-world situations be evaluated and solved through the application of Calculus principles?	Calculate related rates in applied contexts Interpret related rates in applied contexts.	Lecture (video if needed) Example problems Practice Problems	Master Math Mentor packet Videos for lessons	Homework Quiz AP Problem
17 Straight-Line Motion 2 days		Position Velocity Functions Speed Acceleration Function Critical Time	How can real-world situations be evaluated and solved through the application of Calculus principles?	Interpret the meaning of a derivative in context. Calculate rates of change in applied contexts.	Lecture (video if needed) Example problems Practice Problems	Master Math Mentor packet Videos for lessons	Homework Quiz AP Problem
18 Three Important Theorems 2 days		Intermediate-Value Theorem Rolle's Theorem Mean-Value Theorem	How can real-world situations be evaluated and solved through the application of Calculus principles?	Justify conclusions about functions by applying the IVT over an interval. Justify conclusions about functions by applying the Rolle's Theorem over an interval. Justify conclusions about functions by applying the MVT over an interval.	Lecture (video if needed) Example problems Practice Problems	Master Math Mentor packet Videos for lessons	Homework Quiz Test
19 Function Analysis 2 days		Increasing Decreasing Constant Critical Value Stationary Point First Derivative Test Relative Minimum Relative Maximum Relative Extrema Concavity Inflection Point Stationary Inflection Point Second Derivative Test	How can the application of mathematical theorems and properties help mathematical evaluations of equations and graphs?	Justify conclusions about the behavior of a function based on the behavior of its derivatives.	Lecture (video if needed) Example problems Practice Problems	Master Math Mentor packet Videos for lessons	Homework Quiz Test AP Problem
20 Curve Sketching 2 days		Curve Sketching	How can the application of mathematical theorems and properties help	Justify conclusions about the behavior of a function based on the behavior of its derivatives.	Lecture (video if needed) Example problems Practice Problems	Master Math Mentor packet Videos for lessons	Homework Quiz Test AP Problem

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			mathematical evaluations of equations and graphs?				
21 Absolute Extrema 2 days		Extreme Value Theorem Absolute Extrema	How can the application of mathematical theorems and properties help mathematical evaluations of equations and graphs?	Justify conclusions about functions by applying the EVT.	Lecture (video if needed) Example problems Practice Problems	Master Math Mentor packet Videos for lessons	Homework Quiz Test AP Problem
22 Optimization 2 days		Optimization	How can real-world situations be evaluated and solved through the application of Calculus principles?	Calculate minimum and maximum values in applied contexts or analysis of functions.	Lecture (video if needed) Example problems Practice Problems	Master Math Mentor packet Videos for lessons	Homework Test
23 Economic Optimization 2 days			How can real-world situations be evaluated and solved through the application of Calculus principles?	Calculate minimum and maximum values in applied contexts or analysis of functions.	Lecture (video if needed) Example problems Practice Problems	Master Math Mentor packet Videos for lessons	Homework Test Project
24 Indeterminate Forms/L'Hopital's Rule 2 days		Indeterminate Form L'Hopital's Rule	How can the application of mathematical theorems and properties help mathematical evaluations of equations and graphs?	Determine limits of functions that result in indeterminate forms.	Lecture (video if needed) Example problems Practice Problems	Master Math Mentor packet Videos for lessons	Homework Test AP Problem
Review and Tests 9 days							

27 days

**Title** AP Calculus AB/BC

<b>Unit:</b>		<b>Integration and Accumulation of Change</b>					
<b>Big Ideas:</b>		CHA, LIM, FUN					
<b>Unit Essential Questions:</b>		How can the application of geometric knowledge and mathematical rules be used to simplify integration?					
<b>Concept &amp; Pacing</b>	<b>Pa Core Standard</b>	<b>Key Vocabulary</b>	<b>Essential Questions</b>	<b>Competencies (skills, knowledge, abilities)</b>	<b>Mini-Lessons/Activities</b>	<b>Instructional Materials</b>	<b>Assessments</b>
25 Indefinite Integration 2 days		Anti-differentiation Integration Indefinite Integration Integral Sign Differential Equation General solution Initial Condition Specific solution	How can the application of geometric knowledge and mathematical rules be used to simplify integration?	Determine antiderivatives of functions and indefinite integrals, using knowledge about derivatives.	Lecture (video if needed) Example problems Practice Problems	Master Math Mentor packet Videos for lessons	Homework Test
26 u-Substitution 2 days		u-Substitution	How can the application of geometric knowledge and mathematical rules be used to simplify integration?	Determine indefinite integrals for integrands requiring substitution or rearrangements into equivalent forms.	Lecture (video if needed) Example problems Practice Problems	Master Math Mentor packet Videos for lessons	Homework Test
27 Riemann Sums 2 days		Riemann Sums	How can the application of geometric knowledge and mathematical rules be used to simplify integration?	Interpret the limiting case of the Reimann sum as a definite integral. Represent the limiting case of the Reimann sum as a definite integral.	Lecture (video if needed) Example problems Practice Problems	Master Math Mentor packet Videos for lessons	Homework Test
28 Definite Integrals 2 days		Definite Integral Integrand Limits of Integration	How can the application of geometric knowledge and mathematical rules be used to simplify integration?	Represent accumulation functions using definite integrals. Interpret the meaning of areas associated with the graph of a rate of change in context.	Lecture (video if needed) Example problems Practice Problems	Master Math Mentor packet Videos for lessons	Homework Test
29 The Accumulation Function 2 days		Accumulation Function	How can the application of geometric knowledge and mathematical rules be used to simplify integration?	Represent accumulation functions using definite integrals. Interpret the meaning of areas associated with the graph of a rate of change in context.	Lecture (video if needed) Example problems Practice Problems	Master Math Mentor packet Videos for lessons	Homework Quiz
30 The Fundamental Theorem of Calculus		Fundamental Theorem of Calculus	How can the application of geometric knowledge	Evaluate definite integrals analytically using the Fundamental Theorem of Calculus.	Lecture (video if needed) Example problems Practice Problems	Master Math Mentor packet Videos for lessons	Homework Test

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2 days			and mathematical rules be used to simplify integration?	Calculate a definite integral using areas and properties of definite integrals			
31 Definite Integrals with u-Substitution 2 days		Changing the Limits	How can the application of geometric knowledge and mathematical rules be used to simplify integration?	Determine definite integrals for integrands requiring substitution or rearrangements into equivalent forms Calculate a definite integral using areas and properties of definite integrals	Lecture (video if needed) Example problems Practice Problems	Master Math Mentor packet Videos for lessons	Homework Test
32 Transcendental Functions and Integration 2 days			How can the application of geometric knowledge and mathematical rules be used to simplify integration?	Determine definite integrals for integrands requiring substitution or rearrangements into equivalent forms Calculate a definite integral using areas and properties of definite integrals	Lecture (video if needed) Example problems Practice Problems	Master Math Mentor packet Videos for lessons	Homework Test AP Problem
33 Integration by Parts 2 days		Integration by Parts ILATE Tabular Method	How can the application of geometric knowledge and mathematical rules be used to simplify integration?	For integrands requiring integration by parts: determine indefinite integrals and evaluate definite integrals.	Lecture (video if needed) Example problems Practice Problems	Master Math Mentor packet Videos for lessons	Homework Test AP Problem
34 Integration by Partial Fractions 2 days		Partial Fractions Heaviside Method	How can the application of geometric knowledge and mathematical rules be used to simplify integration?	For integrands requiring integration by linear partial fractions: determine indefinite integrals and evaluate definite integrals.	Lecture (video if needed) Example problems Practice Problems	Master Math Mentor packet Videos for lessons	Homework Test AP Problem
35 Improper Integrals 2 days		Improper Integrals Convergent Divergent	How can the application of geometric knowledge and mathematical rules be used to simplify integration?	Evaluate an improper integral or determine that the integral diverges.	Lecture (video if needed) Example problems Practice Problems	Master Math Mentor packet Videos for lessons	Homework Test AP Problem
Review and Tests 9 days							

31 days

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<b>Unit:</b>		<b>Applications of Integration</b>					
<b>Big Ideas:</b>		CHA					
<b>Unit Essential Questions:</b>		How do definite integrals allow us to solve problems involving the accumulation of change over an interval?					
<b>Concept &amp; Pacing</b>	<b>Pa Core Standard</b>	<b>Key Vocabulary</b>	<b>Essential Questions</b>	<b>Competencies (skills, knowledge, abilities)</b>	<b>Mini-Lessons/Activities</b>	<b>Instructional Materials</b>	<b>Assessments</b>
36 Arc Length/ Area of Surface of Revolution 2 days		Arc Length Lateral Surface Area	How do definite integrals allow us to solve problems involving the accumulation of change in length and surface area over an interval?	Determine the length of a curve in a plane defined by a function, using a definite integral.	Lecture (video if needed) Example problems Practice Problems	Master Math Mentor packet Videos for lessons	Homework Quiz
37 Straight-Line Motion Revisited 2 days		Displacement Distance	How do definite integrals allow us to solve problems involving the accumulation of change over an interval?	Determine values for positions and rates of change using definite integrals in problems involving rectilinear motion.	Lecture (video if needed) Example problems Practice Problems	Master Math Mentor packet Videos for lessons	Homework Quiz
38 Average Value and Second FTC 2 days		Mean-Value Theorem of Integrals Average Value Second Fundamental Theorem of Calculus	How do definite integrals allow us to solve problems involving the accumulation of change over an interval?	Determine the average value of a function using definite integrals	Lecture (video if needed) Example problems Practice Problems	Master Math Mentor packet Videos for lessons	Homework Quiz
39 Inverse Trig Functions 2 days			How can the application of geometric knowledge and mathematical rules be used to simplify integration?	For integrands requiring integration with inverse trigonometric functions: determine indefinite integrals and evaluate definite integrals.	Lecture (video if needed) Example problems Practice Problems	Master Math Mentor packet Videos for lessons	Homework Quiz
40 Area of Region Between Two Curves 2 days			How do definite integrals allow us to solve problems involving the accumulation of change in area over an interval?	Calculate areas in the plane using definite integrals.	Lecture (video if needed) Example problems Practice Problems	Master Math Mentor packet Videos for lessons	Homework Test AP Problem Project

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41 Volumes of Revolution 2 days		Disk Method Washer Method	How do definite integrals allow us to solve problems involving the accumulation of change in volume over an interval?	Calculate volumes of solids of revolution using definite integrals. Calculate volumes of solids with known cross sections using definite integrals.	Lecture (video if needed) Example problems Practice Problems	Master Math Mentor packet Videos for lessons	Homework Test AP Problem Project
42 Integration Applications 2 days			How do definite integrals allow us to solve problems involving the accumulation of change over an interval?	Apply various integration techniques and procedures to real-world situations.	Lecture (video if needed) Example problems Practice Problems	Master Math Mentor packet Videos for lessons	Homework AP Problem
Review and Test 5 days							

19 days

**Title** AP Calculus AB/BC

<b>Unit:</b>		<b>Differential Equations</b>					
<b>Big Ideas:</b>		FUN					
<b>Unit Essential Questions:</b>		How can solving differential equations help in determining functions and developing models?					
<b>Concept &amp; Pacing</b>	<b>Pa Core Standard</b>	<b>Key Vocabulary</b>	<b>Essential Questions</b>	<b>Competencies (skills, knowledge, abilities)</b>	<b>Mini-Lessons/Activities</b>	<b>Instructional Materials</b>	<b>Assessments</b>
43 Slope Fields 2 days		Slope/Direction Field	How can solving differential equations help in determining functions and developing models?	Estimate solutions of differential equations.	Lecture (video if needed) Example problems Practice Problems	Master Math Mentor packet Videos for lessons	Homework Quiz
44 Separable Differential Equations 2 days		Separable Differential Equations General Solution of DEQ Particular Solution Initial Condition	How can solving differential equations help in determining functions and developing models?	Determine general and particular solutions to differential equations.	Lecture (video if needed) Example problems Practice Problems	Master Math Mentor packet Videos for lessons	Homework Quiz
45 Euler's Method 2 days		Euler's Method	How can solving differential equations help in determining functions and developing models?	Estimate solutions to differential equations.	Lecture (video if needed) Example problems Practice Problems	Master Math Mentor packet Videos for lessons	Homework Test
46 Exponential Growth 2 days		Exponential Growth Exponential Decay Half-life	How can solving differential equations help in determining functions and developing models?	Interpret the meaning of a differential equation and its context. Determine general and particular solutions for problems involving differential equations in context.	Lecture (video if needed) Example problems Practice Problems	Master Math Mentor packet Videos for lessons	Homework Test
47 Other Forms of Growth and Decay 2 days		Directly Proportional	How can solving differential equations help in determining functions and developing models?	Interpret the meaning of a differential equation and its context. Determine general and particular solutions for problems involving differential equations in context.	Lecture (video if needed) Example problems Practice Problems	Master Math Mentor packet Videos for lessons	Homework Test AP Problem
48 Logistic Growth 2 days		Carrying Capacity Logistic Growth	How can solving differential equations help in determining functions and developing models?	Interpret the meaning of the logistic growth model in context.	Lecture (video if needed) Example problems Practice Problems	Master Math Mentor packet Videos for lessons	Homework Test AP Problem
Review and Tests 3 days 15 days							

**Title** AP Calculus AB/BC

<b>Unit:</b>	<b>Parametric Equations, Polar Coordinates, and Vector-Valued Functions</b>						
<b>Big Ideas:</b>	CHA, FUN						
<b>Unit Essential Questions:</b>	How do derivatives allow us to solve real-world problems involving rates of change? How can solving an initial problem allow us to determine the expression for the position of a particle moving in a plane?						
<b>Concept &amp; Pacing</b>	<b>Pa Core Standard</b>	<b>Key Vocabulary</b>	<b>Essential Questions</b>	<b>Competencies (skills, knowledge, abilities)</b>	<b>Mini-Lessons/Activities</b>	<b>Instructional Materials</b>	<b>Assessments</b>
49 Curves Defined by Parametric Equations 2 days		Parametric Equations Parameter Plane Curve Orientation Eliminate the Parameter	How do derivatives allow us to solve real-world problems involving rates of change?	Define parametric equations. Write rectangular equations in parametric form.	Lecture (video if needed) Example problems Practice Problems	Master Math Mentor packet Videos for lessons	Homework Quiz
50 Calculus and Parametric Equations 2 days			How do derivatives allow us to solve real-world problems involving rates of change?	Calculate derivatives of parametric functions.	Lecture (video if needed) Example problems Practice Problems	Master Math Mentor packet Videos for lessons	Homework Quiz
51 Polar Coordinates and Graphs 2 days		Polar Coordinate Tangent to the Pole	How do derivatives allow us to solve real-world problems involving rates of change?	Calculate derivatives of functions written in polar coordinates.	Lecture (video if needed) Example problems Practice Problems	Master Math Mentor packet Videos for lessons	Homework Test
52 Polar Coordinates - Area and Arc Length 2 days		Arc Length Surface Area	How do derivatives allow us to solve real-world problems involving rates of change?	Calculate areas of regions defined by polar curves using definite integrals.	Lecture (video if needed) Example problems Practice Problems	Master Math Mentor packet Videos for lessons	Homework Test AP Problem
53 Vectors in the Plane 2 days		Scalar Quantities Scalar Vector Magnitude Direction Component Form Resultant Vector Unit Vector Standard Unit Vector Linear Combination Dot Product Orthogonal	How do derivatives allow us to solve real-world problems involving rates of change?	Determine the properties of vectors. Write and solve basic vector problems.	Lecture (video if needed) Example problems Practice Problems	Master Math Mentor packet Videos for lessons	Homework Test
54 Vector-Valued Functions		Vector-Valued Function	How can solving an initial problem allow	Calculate derivatives of vector-valued functions.	Lecture (video if needed) Example problems Practice Problems	Master Math Mentor packet Videos for lessons	Homework Test

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2 days			us to determine the expression for the position of a particle moving in a plane?	Determine the particular solution given a rate vector and initial conditions.			
55 Velocity, Acceleration of Vectors 2 days			How can solving an initial problem allow us to determine the expression for the position of a particle moving in a plane?	Determine values for positions and rates of change in problems involving planar motion.	Lecture (video if needed) Example problems Practice Problems	Master Math Mentor packet Videos for lessons	Homework Test AP Problem
Review and Tests 4 days							

18 days

**Title** AP Calculus AB/BC

<b>Unit:</b>		<b>Infinite Sequences and Series</b>					
<b>Big Ideas:</b>		LIM					
<b>Unit Essential Questions:</b>		How does applying limits allow us to determine the finite sum of infinitely many terms?					
<b>Concept &amp; Pacing</b>	<b>Pa Core Standard</b>	<b>Key Vocabulary</b>	<b>Essential Questions</b>	<b>Competencies (skills, knowledge, abilities)</b>	<b>Mini-Lessons/Activities</b>	<b>Instructional Materials</b>	<b>Assessments</b>
56 Taylor Polynomials 2 days		Taylor Polynomial Factorial MacLaurin Polynomial Lagrange Remainder Lagrange Error	How does applying limits allow us to determine the finite sum of infinitely many terms?	Represent a function at a point as a Taylor polynomial. Approximate function values using a Taylor Polynomial. Determine the error bound associated with a Taylor polynomial approximation.	Lecture (video if needed) Example problems Practice Problems	Master Math Mentor packet Videos for lessons	Homework Quiz
57 Sequences 2 days		Sequence Explicitly Recursively Converge Diverge Monotonic Sequence	How does applying limits allow us to determine the finite sum of infinitely many terms?	Define sequences and important aspects or various sequences. Determine if they will converge or diverge.	Lecture (video if needed) Example problems Practice Problems	Master Math Mentor packet Videos for lessons	Homework Quiz
58 Infinite Series 2days		Series Infinite Series General Term Convergence Tests Nth Term Test Telescoping Series	How does applying limits allow us to determine the finite sum of infinitely many terms?	Identify infinite series. Determine whether a series converges or diverges.	Lecture (video if needed) Example problems Practice Problems	Master Math Mentor packet Videos for lessons	Homework Quiz AP Problem
59 Geometric and p-Series 2 days		Geometric Series p-Series Harmonic Series	How does applying limits allow us to determine the finite sum of infinitely many terms?	Identify geometric and p-series by their unique characteristics. Determine whether a series converges or diverges.	Lecture (video if needed) Example problems Practice Problems	Master Math Mentor packet Videos for lessons	Homework Quiz
60 The Integral Test 2 days		Integral Test	How does applying limits allow us to determine the finite sum of infinitely many terms?	Determine whether a series converges or diverges using the integral test.	Lecture (video if needed) Example problems Practice Problems	Master Math Mentor packet Videos for lessons	Homework Quiz AP Problem
61 Comparison Test 2 days		Direct Comparison Test Limit Comparison Test Benchmark Series	How does applying limits allow us to determine the finite sum of infinitely many terms?	Determine whether a series converges or diverges using the comparison test. Determine whether a series converges or diverges using the limit comparison test.	Lecture (video if needed) Example problems Practice Problems	Master Math Mentor packet Videos for lessons	Homework Quiz
62 Alternating Series		Alternating Series	How does applying limits allow us to	Determine whether a series converges or diverges using the alternating series test.	Lecture (video if needed) Example problems	Master Math Mentor packet Videos for lessons	Homework Quiz

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2 days		Absolute Convergence Conditional Convergence	determine the finite sum of infinitely many terms?		Practice Problems		
63 Ratio and Root Tests 2 days		Ratio Test Root Test	How does applying limits allow us to determine the finite sum of infinitely many terms?	Determine whether a series converges or diverges using the ratio test. Determine whether a series converges or diverges using the root test.	Lecture (video if needed) Example problems Practice Problems	Master Math Mentor packet Videos for lessons	Homework Quiz AP Problem
64 Series Convergence/Divergence Review 2 days			How does applying limits allow us to determine the finite sum of infinitely many terms?	Determine whether a series converges or diverges using an appropriate test.	Lecture (video if needed) Example problems Practice Problems	Master Math Mentor packet Videos for lessons	Homework Quiz
65 Power Series 2 days		Power Series Radius of Convergence	How does applying limits allow us to determine the finite sum of infinitely many terms?	Represent a given function as a power series. Determine the radius of convergence and interval of convergence for a power series.	Lecture (video if needed) Example problems Practice Problems	Master Math Mentor packet Videos for lessons	Homework Quiz
66 Taylor and Maclaurin Series 2 days		Taylor Series Maclaurin Series	How does applying limits allow us to determine the finite sum of infinitely many terms?	Represent a function as a Maclaurin series or a Taylor series.	Lecture (video if needed) Example problems Practice Problems	Master Math Mentor packet Videos for lessons	Homework Quiz
67 Manipulation of Series 2 days			How does applying limits allow us to determine the finite sum of infinitely many terms?	Apply theorem, rules, properties, and algebra to manipulate series.	Lecture (video if needed) Example problems Practice Problems	Master Math Mentor packet Videos for lessons	Homework Quiz AP Problem
Review and Tests 5 days							

29 days

College Board “Big Ideas”

1. **CHA Change-** Using derivatives to describe rates of change of one variable with respect to another or using definite integrals to describe the net change in one variable over an interval of another allows students to understand change in a variety of contexts. It is critical that students grasp the relationship between integration and differentiation as expressed in the Fundamental Theorem of Calculus.
2. **LIM Limits-** Beginning with a discrete model and then considering the consequences of a limiting case allows us to model real-world behavior and to discover and understand important ideas, definitions, formulas, and theorems in calculus.
3. **FUN Analysis of Functions-** Calculus allows us to analyze the behaviors of functions by relating limits to differentiation, integration, and infinite series and relating each of these concepts to the others.

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