

**A.P. CALCULUS First Nine Weeks**  
**\*\*This is only a semester course offered second semester.\*\***

Week(s)	Topics & Objectives	Standards
1		
2		
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A.P. CALCULUS Second Nine Weeks

Week(s)	Topics & Objectives	Standards
10		
11		
12		
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14		
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### A.P. CALCULUS Third Nine Weeks

Week(s)	Topics & Objectives	Standards
19	UNIT 1 Pre-Calculus Review	<ul style="list-style-type: none"> <li>• Slope as rate of change</li> <li>• Parallel &amp; perpendicular lines</li> <li>• Equations of lines</li> <li>• Functions</li> <li>• Domain &amp; range</li> <li>• Families of functions</li> <li>• Piecewise functions</li> <li>• Composition of functions</li> </ul>
20	UNIT 1 Pre-Calculus Review	<ul style="list-style-type: none"> <li>• Exponential growth &amp; decay</li> <li>• Inverse functions</li> <li>• Logarithmic functions</li> <li>• Properties of logarithms</li> <li>• Graphs of basic trigonometric functions</li> <li>• Domain &amp; range of trig functions</li> <li>• Transformations of trig functions</li> <li>• Inverse trig functions</li> </ul>
21	UNIT 2 Limits & Continuity	<ul style="list-style-type: none"> <li>• 1-Estimate limits from graphs or tables</li> <li>• 8-Calculate limits using algebraic methods</li> <li>• 9-Verify the behavior and direction of non-determinate limits</li> <li>• 3-Prove statements using mathematical induction</li> </ul>
22	UNIT 2 Limits & Continuity	<ul style="list-style-type: none"> <li>• 4-Predict and explain the characteristics and behavior of functions and their graphs (domain, range, increasing/decreasing intervals, intercepts, symmetry, and end behavior)</li> <li>• 5-Investigate, describe, and determine asymptotic behavior using tables, graphs, and analytical methods</li> <li>• 6-Determine and justify the continuity and discontinuity of functions</li> <li>• 23-Demonstrate and explain the differences between average and instantaneous rates of change</li> </ul>
23	UNIT 3 Derivatives	<ul style="list-style-type: none"> <li>• 2-Estimate numerical derivatives from graphs or tables of data</li> <li>• 7-Solve mathematical situations and application problems involving or using derivatives, including exponential, logarithmic, and trigonometric functions</li> </ul>
24	UNIT 3 Derivatives	<ul style="list-style-type: none"> <li>• 10-State and apply the formal definition of a derivative</li> <li>• 11-Apply differentiation rules to sums, products, quotients, and powers of functions</li> </ul>

25	UNIT 3 Derivatives	<ul style="list-style-type: none"> <li>12-Use the chain rule and implicit differentiation</li> <li>13-Describe the relationship between differentiability and continuity</li> </ul>
26	UNIT 4 Applications of Derivatives	<ul style="list-style-type: none"> <li>15-Define a derivative and explain the purpose/utility of the derivative</li> <li>16-Apply the derivative as a rate of change in varied contexts, including velocity, speed, and acceleration</li> <li>17-Apply the derivative to find tangent lines and normal lines to given curves at given points</li> </ul>
27	UNIT 4 Applications of Derivatives	<ul style="list-style-type: none"> <li>18-Predict and explain the relationships between functions and their derivatives</li> <li>19-Model rates of change to solve related rate problems</li> <li>20-Solve optimization problems</li> </ul>
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Week(s)	Topics & Objectives	Standards
28	UNIT 4 Applications of Derivatives	<ul style="list-style-type: none"> <li>24-Apply differentiation techniques to curve sketching</li> <li>25-Apply Rolle's Theorem and the Mean Value Theorem and their geometric consequences</li> <li>26-Identify and apply local linear approximations</li> <li>27-Analyze curves with attention to non-decreasing functions and concavity</li> </ul>
29	UNIT 5 Definite Integrals	<ul style="list-style-type: none"> <li>21-State and apply the First and Second Fundamental Theorem of Calculus</li> </ul>
30	UNIT 5 Definite Integrals	<ul style="list-style-type: none"> <li>30-Interpret the concept of definite integral as a limit of Riemann sums over equal subdivisions</li> </ul>
31	UNIT 6 Differential Equations and Mathematical Modeling	<ul style="list-style-type: none"> <li>22-Apply the power rule and u-substitution to evaluate indefinite integrals</li> </ul>
32	UNIT 6 Differential Equations and Mathematical Modeling	<ul style="list-style-type: none"> <li>22-Apply the power rule and u-substitution to evaluate indefinite integrals</li> </ul>
33	UNIT 7 Applications of Definite Integrals	<ul style="list-style-type: none"> <li>28-Apply integration to solve problems of area</li> </ul>

34	UNIT 7 Applications of Definite Integrals	<ul style="list-style-type: none"><li>• 29-Utilize integrals to model and find solutions to real-world problems such as calculating displacement and total distance traveled</li></ul>
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