

Calculus CP Unit 7: Integration

Unit #:	APSDO-00019745	Duration:	5.0 Week(s)	Date(s):	
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Team:
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Grades:
12

Subjects:
Mathematics

Unit Focus

In this unit students will be able to find antiderivatives using definite and indefinite integration as well as substitution. Students will also be able to apply The Fundamental Theorem of Calculus to find the area under a curve and area between curves. Summative assessments may include projects, labs and tests. Primary instructional materials include: Textbook titled Calculus with Applications 8th Edition, by Margaret L. Lial, Raymond N. Greenwell, and Nathan P. Ritchey, and the Calculus in Motion utility based on Geometer's Sketchpad.

Stage 1: Desired Results - Key Understandings

Established Goals	Transfer	
<p>Common Core <i>Mathematics: 12</i></p> <ul style="list-style-type: none"> • Use geometric shapes, their measures, and their properties to describe objects (e.g., modeling a tree trunk or a human torso as a cylinder). <i>CCSS.MATH.CONTENT.HSG.MG.A.1</i> • Apply geometric methods to solve design problems (e.g., designing an object or structure to satisfy physical constraints or minimize cost; working with typographic grid systems based on ratios). <i>CCSS.MATH.CONTENT.HSG.MG.A.3</i> • Look for and express regularity in 	<p>T1 (T50) Based on an understanding of any problem, initiate a plan, execute it and evaluate the reasonableness of the solution.</p> <p>T2 (T53) Articulate how mathematical concepts relate to one another in the context of a problem or in the theoretical sense.</p> <p>T3 (T51) Examine alternate methods to accurately and efficiently solve problems.</p> <p>T4 (T52) Use appropriate tools strategically to deepen understanding of mathematical concepts.</p> <p>T5 (T32) Apply appropriate formulas to determine the unknown.</p> <p>T6 (T41) Compose/decompose shapes or attributes to form new shapes.</p> <p>T7 (T22) Describe and/or solve problems using algebraic expressions, equations, inequalities, and functions.</p> <p>T8 (T23) Use functions or equations to model relationships among quantities.</p>	<p>Meaning</p>
	Understandings	Essential Questions

<p>repeated reasoning. <i>CCSS.MATH.MP.8</i></p> <ul style="list-style-type: none"> Reason abstractly and quantitatively. <i>CCSS.MATH.MP.2</i> 	<p>U1 (U561) Recognition of patterns and structures fosters efficiency in solving problems.</p> <p>U2 (U511) Placing a problem in a category gives you a familiar approach to solving it.</p> <p>U3 (U207) Recognition of predictable mathematical patterns supports the analysis of functional relationships and the prediction of data.</p> <p>U4 (U206) A function can represent how quantities in the real world relate to one another.</p> <p>U5 (U302) Measurements of the same physical property can be converted.</p>	<p>Q1 (Q514) What does the solution represent?</p> <p>Q2 (Q572) How does understanding the pattern/structure help me solve the problem?</p> <p>Q3 (Q407) How much space does this shape (2-D and 3-D) take up/enclose? (Gr. 5-12)</p> <p>Q4 (Q406) What is the theorem/formula necessary to solve this problem? (Gr. 5-12)</p> <p>Q5 (Q203) What is the relationship between/among these values?</p>
Acquisition of Knowledge and Skill		
Knowledge		Skills
		<p>S1</p> <p>Approximate the area between the curve and the x-axis using right-hand, left-hand, and mid-point approximations</p> <p>S2</p> <p>Determine the definite integral of a function using known geometric formulas</p> <p>S3</p> <p>Determine the definite integral of a function using properties of definite integrals</p> <p>S4</p> <p>Apply the Mean Value Theorem for definite integrals</p> <p>S5</p> <p>Use the Fundamental Theorem of Calculus to</p>

		evaluate a definite integral
Stage 3: Learning Plan		
Coding	Code	Description of Learning Activity