

Calculus CP Unit 1: Algebraic Properties and Linear Applications

Unit #:	APSDO-00019716	Duration:	2.0 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 perform any operation on algebraic expression or equation as well as apply linear models to any application. 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			
Common Core <i>Mathematics: 12</i> - Graph linear and quadratic functions and show intercepts, maxima, and minima. <i>CCSS.MATH.CONTENT.HSF.IF.C.7.A</i> - Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions. <i>CCSS.MATH.CONTENT.HSF.IF.C.7.B</i> - Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior. <i>CCSS.MATH.CONTENT.HSF.IF.C.7.C</i>	T1 (T50) Based on an understanding of any problem, initiate a plan, execute it and evaluate the reasonableness of the solution. T2 (T53) Articulate how mathematical concepts relate to one another in the context of a problem or in the theoretical sense. T3 (T51) Examine alternate methods to accurately and efficiently solve problems. T4 (T52) Use appropriate tools strategically to deepen understanding of mathematical concepts. T5 (T22) Describe and/or solve problems using algebraic expressions, equations, inequalities, and functions. T6 (T23) Use functions or equations to model relationships among quantities.			
	Meaning			
	<table> <tr> <th>Understandings</th><th>Essential Questions</th></tr> <tr> <td></td><td></td></tr> </table>	Understandings	Essential Questions	
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- Identify zeros of polynomials when suitable factorizations are available, and use the zeros to construct a rough graph of the function defined by the polynomial. <i>CCSS.MATH.CONTENT.HSA.APR.B.3</i> - Graph rational functions, identifying zeros and asymptotes when suitable factorizations are available, and showing end behavior. <i>CCSS.MATH.CONTENT.HSF.IF.C.7.D</i> - Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude. <i>CCSS.MATH.CONTENT.HSF.IF.C.7.E</i> - Model with mathematics. <i>CCSS.MATH.MP.4</i> - Use appropriate tools strategically. <i>CCSS.MATH.MP.5</i>			U1 (U531) Models can distort or reveal patterns; therefore it is essential to recognize the appropriate representation. U2 (U541) The accuracy of a solution depends upon the proper selection and effective use of a mathematical tool. U3 (U206) A function can represent how quantities in the real world relate to one another.	Q1 (Q530) Is this problem similar to a problem I have solved before? Q2 (Q532) Which model best represents this problem? Q3 (Q541) How do I use tools to solve problems? Q4 (Q201) How can I represent this information in symbols/equations/models?
			Acquisition of Knowledge and Skill	
			Knowledge	Skills
				S1 Simplify polynomial and rational expressions S2 Solve polynomial and rational equations and inequalities S3 Factor and simplify expressions with rational exponents S4 Solve linear applications S5 Create and implement linear regression equations
Stage 3: Learning Plan				
Coding	Code	Description of Learning Activity		