Pre-Calculus CP Unit 6: Rationals and Radicals

Unit #:	APSDO-00018155	Duration:	3.0 Week(s)	Date(s):	

Team:
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Grades:
11, 12
Subjects:
Mathematics

Unit Focus

In this unit, students will expand their understanding of rational, radical, polynomial, exponential, and logarithmic functions. Students will solve rational, radical, and polynomial inequalities. They will graph rational functions and identify points of discontinuity and vertical, horizontal, and slant asymptotes. Students will graph exponential and logarithmic functions showing intercepts and end behavior. Summative assessments may include projects, labs, and tests. Primary instructional materials for this unit include Pre-Calculus, 3rd edition Pearson/Prentice Hall, 2007.

Stage 1: Desired Results - Key Understandings

Established Goals

Common Core
Mathematics: 11

- Explain why the x-coordinates of the points where the graphs of the equations y = f(x) and y = g(x) intersect are the solutions of the equation f(x) = g(x); find the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where f(x) and/or g(x) are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.* *CCSS.MATH.CONTENT.HSA.REI.D.11*

Transfer

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 (T20) Compose and decompose numbers to establish relationships, perform operations, and solve problems.
T6 (T22) Describe and/or solve problems using algebraic expressions, equations, inequalities, and functions.
T7 (T23) Use functions or equations to model relationships among quantities.

Meaning

- Solve simple rational and radical equations in one variable, and give examples showing how extraneous solutions may arise. *CCSS.MATH.CONTENT.HSA.REI.A.2*
- Graph rational functions, identifying zeros and asymptotes when suitable factorizations are available, and showing end behavior. *CCSS.MATH.CONTENT.HSF.IF.C.7.D*
- Look for and express regularity in repeated reasoning. *CCSS.MATH.MP.8*
- Reason abstractly and quantitatively. *CCSS.MATH.MP.2*

Understandings	Essential Questions
U1 (U511) Placing a problem in a category gives you a familiar approach to solving it. **U2** (U561) Recognition of patterns and structures fosters efficiency in solving problems. **U3** (U205) Expressions, equations, inequalities, and functions use symbols to represent quantities, operations, and their relationships. **U4** (U202) The application of specific properties and order of operations can simplify expressions, solve equations, and combine functions. **U5** (U203) Certain mathematical manipulations preserve the relationship in an expression or equation, even though they change the representation.	**Q1** (Q511) What characteristics/attributes define this type of problem? **Q2** (Q513) How could this strategy be used to solve similar problems? **Q3** (Q572) How does understanding the pattern/structure help me solve the problem? **Q4** (Q205) How can I represent this relationship as a function or equation? (Gr. 6-12) **Q5** (Q200) What rule or pattern can help me simplify the expression or solve this problem? **Q6** (Q206) How do I evaluate this function or solve the equation? (Gr. 6-12)

Acquisition of Knowledge and Skill

Knowledge	Skills
	S1 Solve rational, radical, and polynomial inequalities **S2** Graph rational functions and find: domain and range, x-intercepts, y-intercepts, vertical, horizontal, and slant asymptotes holes **S3** Understand how extraneous solution apply to rational and radical functions **S4** Graph logarithmic and exponential functions

		and identify intercepts and end behavior **S5** Understand the limit of a function as it approaches an asymptote or zero

Stage 3: Learning Plan

Coding	Code	Description of Learning Activity