Algebra 2 CP Unit 5: Functions and Inverses

Unit #:	APSDO-00018271	Duration:	4.0 Week(s)	Date(s):	

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Grades:
10, 11
Subjects:
Mathematics

Unit Focus

In this unit, students will operate with functions in both algebraic and graphic form, and then go on to explore radicals and rational exponents. Students will then be able to solve equations containing radicals and rational exponents. Students will apply simplifying radicals to Pythagorean Formula applications. Summative assessments may include projects, labs and test.

Stage 1: Desired Results - Key Understandings

Established Goals

Common Core
Mathematics: 10

- Explain how the definition of the meaning of rational exponents follows from extending the properties of integer exponents to those values, allowing for a notation for radicals in terms of rational exponents.
  CCSS.MATH.CONTENT.HSN.RN.A.1
- 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

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.

Meaning

Understandings	Essential Questions
U1 (U500) Effective problem solvers work to understand the problem before trying to solve	**Q1** (Q200) What rule or pattern can help me simplify the expression or solve this problem?

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*

- Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If f is a function and x is an element of its domain, then f(x) denotes the output of f corresponding to the input x. The graph of f is the graph of the equation y = f(x). *CCSS.MATH.CONTENT.HSF.IF.A.1*
- Combine standard function types using arithmetic operations. *CCSS.MATH.CONTENT.HSF.BF.A.1.B*
- Rewrite expressions involving radicals and rational exponents using the properties of exponents. *CCSS.MATH.CONTENT.HSN.RN.A.2*
- 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*
- Use the structure of an expression to identify ways to rewrite it. For example, see x4 - y4 as (x2)2 - (y2)2, thus recognizing it as a difference of squares that can be factored as (x2 - y2)(x2 + y2). *CCSS.MATH.CONTENT.HSA.SSE.A.2*
- Identify the effect on the graph of replacing f(x) by f(x) + k, k f(x), f(kx), and f(x + k) for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd

it.
U2 (U562) Mastery of basic facts and rules maximizes conceptual and procedural fluency.
U3 (U201) The same value can be represented in multiple ways.
U4 (U203) Certain mathematical manipulations preserve the relationship in an expression or equation, even though they change the representation.

Q2 (Q203) What is the relationship between/among these values?
Q3 (Q503) What strategies/approaches are best for this problem?
Q4 (Q505) Is my answer correct? OR Does my solution make sense?
Q5 (Q561) How does understanding the pattern/structure help me solve the problem?
Q6 (Q563) How does being fluent with basic facts and rules help me solve a complex problem?

Acquisition of Knowledge and Skill

Knowledge

Skills

S1

Operations on functions

S2

Function composition

S3

Finding inverse of a function from equation, graph, and set of ordered pairs

S4

Perform operations with radical expressions

S5

Solve equations containing radicals

S6

Understand how extraneous solutions apply to radical equations

S7

Identify domain and range from a given

functions from their graphs and algebraic expressions for them. *CCSS.MATH.CONTENT.HSF.BF.B.3* • Look for and make use of structure. *CCSS.MATH.MP.7* • Make sense of problems and persevere in solving them. *CCSS.MATH.MP.1*		graph or equation **S8** Use parent functions to graph transformations (quadratic, cubic, square root, cube root, absolute value) **S9** Identify x- and y-intercepts **S10** Restrict domain of a function so that the inverse is also a function **S11** Understand whether a function is even, odd, or neither

Stage 3: Learning Plan

Coding	Code	Description of Learning Activity