Radical Functions and Rational Exponents

Content Area: **Math**
Course(s): **Accelerated Algebra II, CP Algebra II**
Time Period: **Marking Period 3**
Length: **4**
Status: **Published**

Unit Overview

This unit allows students to master rules of exponents, including rational exponents. It also allows students to master the properties of expressions and equations with rational exponents.

Enduring Understandings

Interpret functions that arise in applications in terms of the context.

Analyze functions using different representations.

Build new functions from existing functions.

Build a function that models a relationship between two quantities.

Interpret the structure of expressions.

Create equations that describe numbers or relationships.

Use complex numbers in polynomial identities and equations.

Understand the relationship between zeros and factors of polynomials.

Use polynomial identities to solve problems

Essential Questions

To simplify the nth root of an expression, what must be true about the expression?

When you square each side of an equation, is the resulting equation equivalent to the original?

How are a function and its inverse function related?

New Jersey Student Learning Standards (No CCS)

MA.N-RN.A.1	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.
MA.N-RN.A.2	Rewrite expressions involving radicals and rational exponents using the properties of exponents.
MA.A-SSE.A.2	Use the structure of an expression to identify ways to rewrite it. For example, see $x^4 - y^4$ as $(x^2)^2 - (y^2)^2$, thus recognizing it as a difference of squares that can be factored as $(x^2 - y^2)(x^2 + y^2)$.
MA.F-IF.C.7b	Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions.
MA.F-IF.C.8	Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function.
MA.F-BF.A.1b	Combine standard function types using arithmetic operations.
MA.F-BF.A.1c	Compose functions.
MA.A-CED.A.4	Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations.
MA.F-BF.B.4a	Solve an equation of the form $f(x) = c$ for a simple function f that has an inverse and write an expression for the inverse.
MA.F-BF.B.4c	Read values of an inverse function from a graph or a table, given that the function has an inverse.
MA.A-REI.A.2	Solve simple rational and radical equations in one variable, and give examples showing how extraneous solutions may arise.

Interdisciplinary Connections

LA.W.9-10.6	Use technology, including the Internet, to produce, share, and update individual or shared writing products, taking advantage of technology's capacity to link to other information and to display information flexibly and dynamically.
SCI.HS-ETS1-2	Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.
TECH.8.1.12.C.CS4	Contribute to project teams to produce original works or solve problems.

Technology Standards

TECH.8.1.12.C.CS4	Contribute to project teams to produce original works or solve problems.
TECH.8.1.12.D.CS3	Exhibit leadership for digital citizenship.
TECH.8.1.12.E.CS4	Process data and report results.
TECH.8.1.12.F.CS3	Collect and analyze data to identify solutions and/or make informed decisions.
TECH.8.1.12.F.CS4	Use multiple processes and diverse perspectives to explore alternative solutions.
TECH.8.2.12.C.CS2	The application of engineering design.

21st Century Themes/Careers

| CAEP.9.2.12.C.3 | Identify transferable career skills and design alternate career plans. |

Financial Literacy Integration

| PFL.9.1.12.C.1 | Compare and contrast the financial benefits of different products and services offered by a variety of financial institutions. |

Instructional Strategies & Learning Activities

- Use graphing calculator to explore tables.
- Spend time with modeling activities.
- Spend at least one day dedicated to modeling problems
- Use problems and activities from book involving modeling problems
- ~~Provide access to online book~~
- Provide ~~access to~~ book pages and problems through Canvas and Twitter
- Provide access to review keys
- ~~Assign ExamView Questions to provide practice and assessment.~~
- Use Delta Math for practice and assessments.

Formative Assessments

- Daily homework checks
- ~~ExamView Questions~~
- Delta Math assignments
- ~~Chapter~~ Unit Test
- Exit Tickets
- Warm-ups
- Quizzes

Summative Assessment

- Unit Test

Benchmark Assessments

- Linkit Benchmark Exam 2

Resources & Technology

- google docs, spreadsheets, slides
- TI graphing calculator
- document camera
- Chromebooks
- websites: desmos, ~~Examview~~, EdPuzzle
- ~~Canvas quizzes~~
- Delta Math
- Teacher Created YouTube Videos
- Promethean Board