

Unit 6 - Radicals, Exponents, and Logarithms

Overview

This unit will help students build fluency with radicals and rational exponents. They should know why negative exponents mean “divide” and rational exponents are equivalent to radical notation. We want students to know that a logarithm is used to solve for a variable in the exponent. Logarithms are a way to solve difficult (near impossible) problems in a fast, easy way. Use the language for rational exponents: “ $8^{(2/3)}$ means: 2 of the 3 ‘identical factors’ that multiply to 8.”

21st Century Capacities: Analyzing, Synthesizing

Stage 1 - Desired Results

ESTABLISHED GOALS/ STANDARDS	Transfer:	
<p>MP 1 Make sense of problems and persevere in solving them</p> <p>MP2 Reason abstractly and quantitatively</p> <p>MP4 Model with Mathematics</p> <p>MP7 Look for and make use of structure</p>	<p><i>Students will be able to independently use their learning in new situations to...</i></p> <ol style="list-style-type: none"> 1. Manipulate equations/expressions or objects to create order and establish relationships. (Analyzing and Synthesizing) 2. Demonstrate fluency with math facts, computation and concepts. 3. Use appropriate tools to make reaching solutions more efficient, accessible and accurate.(Synthesizing) 4. Model relationships among quantities. (Analyzing) 	
	Meaning:	
<p>CCSS.MATH.CONTENT.HSN.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.</p> <p>CCSS.MATH.CONTENT.HSN.RN.A.2 Rewrite expressions involving radicals and rational exponents using the properties of exponents.</p> <p>CCSS.MATH.CONTENT.HSF.IF.C.8.B</p>	<p>UNDERSTANDINGS: <i>Students will understand that:</i></p> <ol style="list-style-type: none"> 1. Mathematicians understand that placing a problem in a category gives one a familiar approach to solving it. 2. Mathematicians use numbers, ways of representing numbers, relationships among numbers, and number systems to build meaning. 3. Mathematicians examine the impact of operations and how they relate to one another. 4. Mathematicians represent and analyze mathematical situations and structures using algebraic symbols to communicate thinking. 	<p>ESSENTIAL QUESTIONS: <i>Students will explore & address these recurring questions:</i></p> <ol style="list-style-type: none"> A. What is the most efficient way to solve this problem? B. How can I simplify the problem? C. Have I used what I understand about numbers to make this easier? D. How do operations relate to one another? E. What is another way to represent this number?

PreCollege Algebra & Trigonometry Curriculum

<p>Use the properties of exponents to interpret expressions for exponential functions.</p> <p>CCSS.MATH.CONTENT.HSF.BF.B.5 (+) Understand the inverse relationship between exponents and logarithms and use this relationship to solve problems involving logarithms and exponents.</p> <p>CCSS.MATH.CONTENT.HSF.LE.A.4 For exponential models, express as a logarithm the solution to $ab^ct = d$ where a, c, and d are numbers and the base b is 2, 10, or e; evaluate the logarithm using technology.</p> <p>CCSS.MATH.CONTENT.HSF.LE.B.5 Interpret the parameters in a linear or exponential function in terms of a context.</p>	Acquisition:	
	<p><i>Students will know...</i></p> <ol style="list-style-type: none"> 1. Radicals can be expressed as exponents 2. When to use logarithms 3. Logarithmic function is the inverse of an exponential function 4. Vocabulary: Logarithm, Radical, Rational Exponent, argument, base 	<p><i>Students will be skilled at...</i></p> <ol style="list-style-type: none"> 1. Simplifying expressions with radicals and exponents 2. Converting between exponential and logarithmic equations 3. Applying the properties of logs to expand or condense expressions 4. Solving equations involving radicals and rational exponents (with and without logarithms)