

## New Jersey Curriculum Matrix for Mathematics

New Jersey Mathematics Standards/Strands/ Cumulative Progress Indicators Grades 9-12	Common Core Mathematics Domains/Clusters High School	National Essential Skills Study (NESS) Rankings		NESS	HPSA	Priority
		Rank				
<b>Standard 4.1 – Number and Numerical Operations</b> All students will develop number sense and will perform standard numerical operations and estimations on all types of numbers in a variety of ways.						
<b>4.1.12 A. Number Sense</b>						
1. Extend understanding of the number system to all real numbers.	<b><u>Number &amp; Quantity: The Real Number System</u></b> <b>Use properties of rational and irrational numbers.</b> 3. Explain why the sum or product of two rational numbers is rational; that the sum of a rational number and an irrational number is irrational; and that the product of a nonzero rational number and an irrational number is irrational.	M35	Use the properties of real (rational and irrational) numbers and demonstrate understanding of ordering and absolute value.	M	M	M
2. Compare and order rational and irrational numbers.	<i>There is no New Jersey Mathematics Cumulative Progress Indicator-Common Core alignment.</i>	M35	Use the properties of real (rational and irrational) numbers and demonstrate understanding of ordering and absolute value.	M	M	M
		M39	Apply techniques to obtain a rational approximation or estimate of a quantity or number (including irrational numbers such as radicals).			

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3. Develop conjectures and informal proofs of properties of number systems and sets of numbers.	<b><u>Number &amp; Quantity: The Real Number System</u></b> <b>Use properties of rational and irrational numbers.</b> 3. Explain why the sum or product of two rational numbers is rational; that the sum of a rational number and an irrational number is irrational; and that the product of a nonzero rational number and an irrational number is irrational.	M10	Understand and apply a systematic methodology or procedure (e.g., direct or indirect measurement, direct or indirect proof, inductive or deductive reasoning) to model and solve problems.	H	M	H
<b>4.1.12 B. Numerical Operations</b>						
1. Extend understanding and use of operations to real numbers and algebraic procedures.	<b><u>Algebra: Arithmetic with Polynomials &amp; Rational Expressions</u></b> <b>Rewrite rational expressions.</b> 7. (+) Understand that rational expressions form a system analogous to the rational numbers, closed under addition, subtraction, multiplication, and division by a nonzero rational expression; add, subtract, multiply, and divide rational expressions.	M33	Perform operations with radicals, such as addition, subtraction, and multiplication.	M	M	M
		M36	Simplify polynomials by performing operations (addition, subtraction, multiplication, and division) to simplify expressions (e.g., $(2a + 2) + (3a - 1) = 5a + 1$ ).			
		M62	Perform division of a polynomial by a monomial by dividing powers with like bases, using the rules for the division of powers with like bases to simplify fractions with monomial denominators and reducing fractions to lowest terms.			

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2. Develop, apply, and explain methods for solving problems involving rational and negative exponents.	<p><b><u>Number &amp; Quantity: The Real Number System</u></b>  <b>Extend the properties of exponents to rational exponents.</b></p> <p>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. <i>For example, we define <math>5^{1/3}</math> to be the cube root of 5 because we want <math>(5^{1/3})^3 = 5^{(1/3)3}</math> to hold, so <math>(5^{1/3})^3</math> must equal 5.</i></p> <p>2. Rewrite expressions involving radicals and rational exponents using the properties of exponents.</p>	M20 Understand and apply the basic properties and laws of exponents and scientific notation to solve problems, including those with fractional, negative, and zero exponents.	M	M	M
3. Perform operations on matrices. <ul style="list-style-type: none"> <li>Addition and subtraction</li> <li>Scalar multiplication</li> </ul>	<p><b><u>Number &amp; Quantity: Vector and Matrix Quantities</u></b>  <b>Perform operations on matrices and use matrices in applications.</b></p> <p>6. (+) Use matrices to represent and manipulate data, e.g., to represent payoffs or incidence relationships in a network.</p> <p>7. (+) Multiply matrices by scalars to produce new matrices, e.g., as when all of the payoffs in a game are doubled.</p> <p>8. (+) Add, subtract, and multiply matrices of appropriate dimensions.</p>	M50 Understand the concepts and apply the uses of matrices in modeling (i.e., finite graphs or structures that can be represented geometrically and interpreted algebraically in the form of a matrix).	L	M	M
4. Understand and apply the laws of exponents to simplify expressions involving numbers raised to powers.	<p><b><u>Number &amp; Quantity: The Real Number System</u></b>  <b>Extend the properties of exponents to rational exponents.</b></p> <p>2. Rewrite expressions involving radicals and rational exponents using the properties of exponents.</p>	M20 Understand and apply the basic properties and laws of exponents and scientific notation to solve problems, including those with fractional, negative, and zero exponents.	M	M	M