PATERSON PUBLIC SCHOOLS

Preparing All Children for College and Career

Mathematics Pacing

Algebra II	UNIT: # 1	Instruction: 9/7/17 – 10/31/17 Assessment: 11/1/17 – 11/8/17	Complex Solutions and Modeling with Rational Exponents

#	STUDENT LEARNING OBJECTIVES	NJSLS	Resources
1	Add, subtract, and multiply complex numbers using the commutative, associative and distributive properties.	N.CN.A.1, N.CN.A.2	
2	Solve quadratic equations with real coefficients that have complex solutions by taking square roots, completing the square and factoring.	N.CN.C.7, A.REI.B.4b	
3	Solve simple systems consisting of a linear and quadratic equation in two variables algebraically and graphically.	A.REI.C.7	
4	Solve algebraically a system of three linear equations.	A.REI.C.6	
5	Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms.	F.BF.A.2, F.LE.A.2, F.LE.B.5	
6	Use the formula for the sum of a finite geometric series to solve problems [for example, calculate mortgage payments; derive the formula for the sum of a finite geometric series (when the common ratio is not 1)].	A.SSE.B.4	
7	Use properties of integer exponents to explain and convert between expressions involving radicals and rational exponents.	N.RN.A.1, N.RN.A.2	**IFL "Investigating Rational**

			Exponents”
8	Use the properties of exponents to transform expressions for exponential functions, explain properties of the quantity revealed in the transformed expression or different properties of the function.	A.SSE.B.3c, F.IF.C.8b	
9	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.	F.LE.A.4	

Key: Major Clusters | Supporting | Additional Clusters | * Benchmarked Standard

Code #	New Jersey Student Learning Standards
N.CN.A.1	Know there is a complex number *i* such that $i^2 = -1$, and every complex number has the form *a* + *bi* with *a* and *b* real.
N.CN.A.2	Use the relation $i^2 = -1$ and the commutative, associative, and distributive properties to add, subtract, and multiply complex numbers
N.CN.C.7	Solve quadratic equations with real coefficients that have complex solutions.
A.REI.B.4b	Solve quadratic equations in one variable. b) Solve quadratic equations by inspection (e.g., for $x^2 = 49$), taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions and write them as a ± bi for real numbers a and b.

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A.REI.C.7	Solve a simple system consisting of a linear equation and a quadratic equation in two variables algebraically and graphically. For example, find the points of intersection between the line $y = -3x$ and the circle $x^2 + y^2 = 3$.
A.REI.C.6	Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.
F.BF.A.2	Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms.
F.LE.A.2	Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table).
F.LE.B.5	Interpret the parameters in a linear or exponential function in terms of a context.
A.SSE.B.4	Derive and/or explain the derivation of the formula for the sum of a finite geometric series (when the common ratio is not 1), and use the formula to solve problems. *For example, calculate mortgage payments*.
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. *For example, we define* $5^{1/3}$ *to be the cube root of 5 because we want* $(5^{1/3})^3 = 5^{(1/3)3}$ *to hold, so* $(5^{1/3})^3$ *must equal 5*.
N.RN.A.2	Rewrite expressions involving radicals and rational exponents using the properties of exponents.
A.SSE.B.3	Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression c) Use the properties of exponents to transform expressions for exponential functions. For example the expression 1.15^t can be rewritten as $(1.15^{1/12})^{12t}$ □$\approx 1.012^{12t}$ to reveal the approximate equivalent monthly interest rate if the

	annual rate is 15%.
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 b) Use the properties of exponents to interpret expressions for exponential functions. For example, identify percent rate of change in functions such as $y = (1.02)^t$, $y = (0.97)^t$, $y = (1.01)^{12t}$, $y = (1.2)^{t/10}$, and classify them as representing exponential growth or decay.
F.LE.A.4	Understand the inverse relationship between exponents and logarithms. 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.