Honors Algebra 2 UNIT PLANNER

Unit title	Quadratics Revisited (DOE Unit 1)	Unit duration	7 weeks

Essential Questions (OR GUIDING QUESTIONS?)

- Why is it important to allow solutions for $x^2 + 1 = 0$?
- How are complex and real numbers related?
- How is the factored form helpful in solving quadratic equations?
- How can you represent and operate on numbers that are not on the real number line?
- How can you solve a quadratic equation by completing the square?
- How can you use the Quadratic Formula to solve quadratic equations?
- How can you predict the nature of quadratic functions solutions using the Quadratic Formula?

Assessments

Common Formative: Complex Numbers
Common Summative: Mid Unit Assessment (Complex numbers, Factoring, Completing the Square), Cumulative Unit 1 Test

Content Standards

MGSE9-12.N.CN.1 Understand there is a complex number i such that $i^2 = -1$, and every complex number has the form a + bi where a and b are real numbers.
MGSE9-12.N.CN.2 Use the relation $i^2 = -1$ and the commutative, associative, and distributive properties to add, subtract, and multiply complex numbers.
MGSE9-12.N.CN.3 Find the conjugate of a complex number; use the conjugate to find the ~~absolute value (modulus) and~~ quotient of complex numbers.
MGSE9-12.N.CN.7 Solve quadratic equations with real coefficients that have complex solutions by (but not limited to) square roots, completing the square, and the quadratic formula.
MGSE9-12.N.CN.8 Extend polynomial identities to include factoring with complex numbers. *For example, rewrite $x^2 + 4$ as $(x + 2i)(x – 2i)$.*
MGSE9-12.A.REI.4 Solve quadratic equations in one variable.
MGSE9-12.A.REI.4b Solve quadratic equations by inspection (e.g., for $x^2 = 49$), taking square roots, factoring, completing the square, and the quadratic formula, as appropriate to the initial form of the equation ~~(limit to real number solutions)~~
MGSE9-12.N.RN.1. Explain how the meaning of rational exponents follows from extending the properties of integer exponents to rational numbers, 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 $[5^{(1/3)}]^3 = 5^{[(1/3) \times 3]}$ to hold, so $[5^{(1/3)}]^3$ must equal 5.*
MGSE9-12.N.RN.2 Rewrite expressions involving radicals and rational exponents using the properties of exponents.

Learning Activities and Experiences

Topic	Task	Content Addressed	Standards Addressed
Factoring	Understanding Factoring Practice	• Factor difference of squares, binomials and trinomials practice. • Identify solutions of the functions.	REI.4, REI.4b
	Additional Resources:		
Complex Numbers	**2-4 Complex Numbers & Operations** **Pearson enVision pg. 95 - 101**	• Add, subtract, and multiply complex numbers using the properties of operations and the relation $i^2 = -1$ • Use complex numbers to represent numbers that are not on the real number line.	CN.1, CN.2, CN.3
	Additional Resources:		
Rational Exponents	**5-1 *n*th Roots, Radicals, and Rational Exponents** **Pearson enVision pg. 239 – 246**	• Find all real *n*th roots of a number • Evaluate expressions with rational exponents • Use *n*th roots to solve equations by rewriting expressions using the properties of exponents.	MGSE9-12.N.RN.1 MGSE9-12.N.RN.2
	5-2 Properties of Exponents and Radicals **Pearson enVision pg. 247 - 254**	• Use the properties of exponents and radicals to identify ways to rewrite radical expressions. • Interpret radical expressions that represent a quantity in terms of its context.	MGSE9-12.N.RN.2
	Additional Resources:		

Solving Quadratic Equations	**2-3 Factored Form of a Quadratic Function** **Pearson enVision pg. 88 – 94**	• Write a quadratic equation in factored form and use it to identify zeros of the function it defines. • Determine the intervals over which a quadratic function is positive or negative.	REI.4, REI.4b
	2-5 Completing the Square **Pearson enVision pg. 103 – 109**	• Transform a quadratic equation into the form $(x - p)^2 = q$ by completing the square • Complete the square to reveal the minimum or maximum value of a quadratic expression	CN.7, REI.4, REI.4b
	2-6 The Quadratic Formula **Pearson enVision pg. 110 - 116**	• Use the Quadratic Formula to solve quadratic equations that have complex solutions.	CN.7, REI.4, REI.4b
	Additional Resources:		

Personalized Learning and Differentiation

Teachers differentiate by providing examples (work samples or task-specific clarifications of assessment criteria); structuring support (advance organizers, flexible grouping, peer relationships); establishing flexible deadlines, and adjusting the pace.

-SWD/504- Accommodations provided
-ELL- Five Principle ELL Curriculum Framework and Vocabulary Supports
-Intervention Support- Re-teaching Activities in Small Groups with Progress Monitoring
-Extensions- Enrichment Tasks and Projects

Resources

DOE Curriculum Framework - Unit 1
Savvas enVision Textbook
Khan Academy
Delta Math