Northern York County School District

Curriculum Overview

Course: Academic Algebra II	
Grade Level: 10/11	
Development/Revision Date: May 2022	**Length of Time:** 180 Days
Course Description: Academic Algebra II extends many of the topics in Algebra I with a more in-depth approach to Algebra II. This course examines nonlinear functions including quadratics, polynomials, rational exponent and radical functions. Specific topics this course focuses on include simplifying expressions, factoring, solving techniques, and graphing functions. This course provides students the opportunity to meet the demands of math related degrees in college. This course will also prepare students for the math portion of the College Board's SAT.	
Course Objectives: • Understand how to simplify, graph, solve, and write linear functions, quadratic functions, polynomial functions, radical functions, exponential functions, logarithmic functions, and rational functions. • Solve linear and nonlinear systems of equations algebraically and graphically. • Utilize a graphing calculator to enhance understanding of algebraic functions. • Solve real-life problems that involve algebraic functions.	
Foundational Units: • Linear Functions • Quadratic Functions • Quadratic Equations and Complex Numbers • Polynomial Functions • Rational Exponents and Radical Functions • Exponential and Logarithmic Functions • Rational Functions	
Related Standards: CC.2.2.HS.D.7 Create and graph equations or inequalities to describe numbers or relationships. CC.2.2.HS.D.9 Use reasoning to solve equations and justify the solution method. CC.2.2.HS.D.10 Represent, solve, and interpret equations/inequalities and systems of equations/inequalities algebraically and graphically CC.2.2.HS.C.2 Graph and analyze functions and use their properties to make connections between the different representations. CC.2.2.HS.C.3 Write functions or sequences that model relationships between two quantities. CC.2.2.HS.C.6 Interpret functions in terms of the situations they model.	
Concepts: • Linear functions • Quadratic functions • Complex Numbers • Polynomial functions • Rational Exponents and Radical functions • Exponential and logarithmic functions	Competencies • Graph and describe transformations of functions, write functions that represent transformations of functions, model with linear functions and solve linear systems including linear systems in 3 variables.

- Rational functions - Trigonometric ratios and functions - Systems of equations	- Analyze characteristics of quadratic functions, write equations of parabolas, and use quadratic functions to model real-life situations. - Perform operations with complex numbers. - Use various methods to solve quadratic equations having both real and imaginary solutions. - Solve nonlinear systems of equations graphically and algebraically. - Solve and graph quadratic inequalities. - Perform operations with polynomials, factor polynomials, graph polynomial functions, write and solve polynomial equations (including polynomials with imaginary roots) and analyze graphs of polynomial functions. - Graph radical functions, solve radical equations, perform operations with radicals, perform operations on two functions, find the composition of functions and find the inverses of functions. - Apply the properties of exponential and logarithmic functions to simplify, graph and solve exponential and logarithmic functions including real-life applications. - Simplify, graph and perform operations with rational functions, solve rational equations including real-life applications - Evaluate trigonometric functions, model using trigonometric functions and use basic trigonometric identities - Use matrices to model and solve linear systems.
Learning Activities: - Note-making (Jig-Saw, Class Discussion, Direct Instruction) - Warm up Problems - Summarizing Problems/Prompts - Collaborative Activities - Guided Practice - Independent Practice	**Performance Tasks:** - Unit Assessments - Projects - Checks for Understanding (Exit Tickets)

Other Assessment Measures:
Homework, Classwork, Presentations

Textbook/Primary Resource:
Ron Larson & Laurie Boswell, Algebra 2, Big Ideas Learning

Supplemental Resource Materials:
District created resources, Online Resource