



# **Pine Grove Area**

## SCHOOL DISTRICT

**Mathematics**

**Algebra II**

**October 15, 2009**

### **I. PHILOSOPHY**

The Algebra II course of the Pine Grove Area School District has been structured to continue algebraic skills from the Algebra I course. Students will study linear systems, matrices, quadratic equations, imaginary and complex numbers, polynomials, radical functions, rational exponents, functions, and rational expressions. These skills will be practiced in order for students to be ready for trigonometry and pre-calculus. This class is based on to the Pennsylvania Academic Standards. Technology will also be integrated into the course to accommodate the many learning styles, motivational levels, and academic abilities.

## **II. CORE CONCEPTS**

1. Linear Systems: Solve systems of linear equations using graphing, substitution, and elimination. Solve systems of inequalities and systems with three variables.
2. Matrices: Create, add, subtract, multiply, and evaluate matrices to solve systems of equations.
3. Quadratic Equations and Functions: Solve quadratic equations using square roots, and factoring. Graph quadratic equations by hand and by a calculator. Represent data as a quadratic function.
4. Imaginary and Complex Numbers: Define, simplify, add, subtract, multiply, and use to find the solutions of some quadratic equations.
5. Polynomials and Polynomial Equations: Identify, factor, add, subtract, multiply, and divide polynomials. Solve polynomial equations.
6. Radical Functions: Simplify, multiply, divide, add, and subtract radical expressions and binomial radical expressions. Rationalize denominators. Solve radical equations. Graph radical functions by hand and using a calculator.
7. Rational Exponents: Change between rational exponents and radicals in order to simplify. Use properties of exponents to simplify expressions.
8. Functions: Define, add, subtract, multiply, divide, and composition of functions. Identify domain and range. Define and graph inverse functions.
9. Rational Expressions: Simplify, add, subtract, multiply, and divide rational expressions and solve rational equations.

### **III. COURSE OF STUDY**

- A. Course Name: Algebra II
- B. Grade Level: 9 - 12
- C. Length of Course: Full Year, one period
- D. Academic Level: Post Secondary
- E. Credits: 1
- F. Prerequisites: Algebra I
- G. Course Description: This course is an extension of Algebra I, but it goes well beyond the limits of the previous course. The types of equations expand to include quadratic and fractional as well as to solving systems of equations. It includes a further study of factoring methods and of simplifying rational expressions. The problem solving skills are continually refined with more involved and more sophisticated applications using one or two variables in various equations and inequalities.

**IV. CONTENT:** Algebra II

**CORE CONCEPT 1:** Linear Systems

**MAJOR OBJECTIVE:** Solve systems of linear equations using graphing, substitution, and elimination. Solve systems of inequalities and systems with three variables.

<b>CURRICULUM STANDARD:</b>			
State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p><b>PA Standard 2.8.11.D</b> Formulate expressions, equations, inequalities, systems of equations, systems of inequalities and matrices to model routine and non-routine problem situations.</p>	<p>Teacher will guide students to:  Write systems of equations and inequalities when given a problem.</p>	<p>Teacher evaluation of:  Student board work  Student written calculations  Homework  Observations in class  Oral question and answer  Journal writing  Test/quiz  Pass to leave  Station activities</p>	<p>Textbook resources  Workbook resources  Student notebooks  Journal  Graphing Calculators  Manipulatives  Promethean Board/ laptops  Computer programs/web sites  Supplemental materials</p>

**CONTENT:** Algebra II

**CORE CONCEPT 1:** Linear Systems

**MAJOR OBJECTIVE:** Solve systems of linear equations using graphing, substitution, and elimination. Solve systems of inequalities and systems with three variables.

<b>CURRICULUM STANDARD:</b>			
State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<b>PA Standard 2.8.11.F</b> Identify whether systems of equations and inequalities are consistent or inconsistent.	Teacher will guide students to:  Classify systems of equations and inequalities as inconsistent, consistent, dependent, and/or independent.	Teacher evaluation of:  Student board work  Student written calculations  Homework  Observations in class  Oral question and answer  Journal writing  Test/quiz  Pass to leave  Station activities	Textbook resources  Workbook resources  Student notebooks  Journal  Graphing Calculators  Manipulatives  Promethean Board/ laptops  Computer programs/web sites  Supplemental materials

**CONTENT:** Algebra II

**CORE CONCEPT 1:** Linear Systems

**MAJOR OBJECTIVE:** Solve systems of linear equations using graphing, substitution, and elimination. Solve systems of inequalities and systems with three variables.

<b>CURRICULUM STANDARD:</b>			
State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<b>PA Standard 2.8.11.G</b> Analyze and explain systems of equations, systems of inequalities and matrices.	Teacher will guide students to:  Interpret the results of solving systems of equations and inequalities in the context of the situation that motivated the model.	Teacher evaluation of:  Student board work  Student written calculations  Homework  Observations in class  Oral question and answer  Journal writing  Test/quiz  Pass to leave  Station activities	Textbook resources  Workbook resources  Student notebooks  Journal  Graphing Calculators  Manipulatives  Promethean Board/ laptops  Computer programs/web sites  Supplemental materials

**CONTENT:** Algebra II

**CORE CONCEPT 1:** Linear Systems

**MAJOR OBJECTIVE:** Solve systems of linear equations using graphing, substitution, and elimination. Solve systems of inequalities and systems with three variables.

<b>CURRICULUM STANDARD:</b>			
State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<b>PA Standard 2.8.11.H</b> Select and use an appropriate strategy to solve systems of equations and inequalities using graphing calculators, symbol manipulators, spreadsheets and other software.	Teacher will guide students to:  Solve systems of equations by graphing, substitution, or elimination.  Solve systems of inequalities by graphing.  Choose an appropriate way to solve systems of equations.	Teacher evaluation of:  Student board work  Student written calculations  Homework  Observations in class  Oral question and answer  Journal writing  Test/quiz  Pass to leave  Station activities	Textbook resources  Workbook resources  Student notebooks  Journal  Graphing Calculators  Manipulatives  Promethean Board/ laptops  Computer programs/web sites  Supplemental materials

**CONTENT:** Algebra II

**CORE CONCEPT 2:** Matrices

**MAJOR OBJECTIVE:** Create, add, subtract, multiply, and evaluate matrices to solve systems of equations.

<b>CURRICULUM STANDARD:</b>			
PA State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<b>PA Standard 2.8.11.D</b> Formulate expressions, equations, inequalities, systems of equations, systems of inequalities and matrices to model routine and non-routine problem situations.	Teacher will guide students to:  Write and/or solve systems of equations using matrices.  Organize data into matrices.	Teacher evaluation of:  Student board work  Student written calculations  Homework  Observations in class  Oral question and answer  Journal writing  Test/quiz  Pass to leave  Station activities	Textbook resources  Workbook resources  Student notebooks  Journal  Graphing Calculators  Manipulatives  Promethean Board/ laptops  Computer programs/web sites  Supplemental materials

**CONTENT:** Algebra II

**CORE CONCEPT 2:** Matrices

**MAJOR OBJECTIVE:** Create, add, subtract, multiply, and evaluate matrices to solve systems of equations.

<b>CURRICULUM STANDARD:</b>			
PA State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<b>PA Standard 2.8.11.G</b> Analyze and explain systems of equations, systems of inequalities and matrices.	Teacher will guide students to:  Explain and evaluate matrices to solve systems of equations.	Teacher evaluation of:  Student board work  Student written calculations  Homework  Observations in class  Oral question and answer  Journal writing  Test/quiz  Pass to leave  Station activities	Textbook resources  Workbook resources  Student notebooks  Journal  Graphing Calculators  Manipulatives  Promethean Board/ laptops  Computer programs/web sites  Supplemental materials

**CONTENT:** Algebra II

**CORE CONCEPT 2:** Matrices

**MAJOR OBJECTIVE:** Create, add, subtract, multiply, and evaluate matrices to solve systems of equations.

<b>CURRICULUM STANDARD:</b>			
PA State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<b>PA Standard 2.8.11.H</b> Select and use an appropriate strategy to solve systems of equations and inequalities using graphing calculators, symbol manipulators, spreadsheets and other software.	Teacher will guide students to:  Use a graphing calculator to solve matrices.	Teacher evaluation of:  Student board work  Student written calculations  Homework  Observations in class  Oral question and answer  Journal writing  Test/quiz  Pass to leave  Station activities	Textbook resources  Workbook resources  Student notebooks  Journal  Graphing Calculators  Manipulatives  Promethean Board/ laptops  Computer programs/web sites  Supplemental materials

**CONTENT:** Algebra II

**CORE CONCEPT 2:** Matrices

**MAJOR OBJECTIVE:** Create, add, subtract, multiply, and evaluate matrices to solve systems of equations.

**CURRICULUM STANDARD:**

PA State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p><b>PA Standard 2.8.11.I</b> Use matrices to organize and manipulate data, including matrix addition, subtraction, multiplication and scalar multiplication.</p>	<p>Teacher will guide students to:</p> <p>Determine the size of matrices.</p> <p>Organize data into matrices.</p> <p>Evaluate matrix operations – add, subtract, multiply, and scalar multiplication by using a calculator.</p> <p>Find missing variables in equivalent matrices.</p>	<p>Teacher evaluation of:</p> <p>Student board work</p> <p>Student written calculations</p> <p>Homework</p> <p>Observations in class</p> <p>Oral question and answer</p> <p>Journal writing</p> <p>Test/quiz</p> <p>Pass to leave</p> <p>Station activities</p>	<p>Textbook resources</p> <p>Workbook resources</p> <p>Student notebooks</p> <p>Journal</p> <p>Graphing Calculators</p> <p>Manipulatives</p> <p>Promethean Board/ laptops</p> <p>Computer programs/web sites</p> <p>Supplemental materials</p>

**CONTENT:** Algebra II

**CORE CONCEPT 3:** Quadratic Equations and Functions

**MAJOR OBJECTIVE:** Solve quadratic equations using square roots, and factoring. Graph quadratic equations by hand and by a calculator. Represent data as a quadratic function.

<b>CURRICULUM STANDARD:</b>			
State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<b>PA Standard 2.1.11.A</b> Use operations (e.g., opposite, reciprocal, absolute value, raising to a power, finding roots, finding logarithms).	Teacher will guide students to:  Use factoring to create equivalent forms of polynomials.  Find common and binomial factors of quadratic expressions.  Factor special quadratic expressions.	Teacher evaluation of:  Student board work  Student written calculations  Homework  Observations in class  Oral question and answer  Journal writing  Test/quiz  Pass to leave  Station activities	Textbook resources  Workbook resources  Student notebooks  Journal  Graphing Calculators  Manipulatives  Promethean Board/ laptops  Computer programs/web sites  Supplemental materials

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<b>CURRICULUM STANDARD:</b>			
State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<b>PA Standard 2.8.11.N</b> Solve linear, quadratic and exponential equations both symbolically and graphically.	Teacher will guide students to:  Solve quadratic equations by using the following methods: <ul style="list-style-type: none"><li>• Factoring</li><li>• Finding square roots</li><li>• Graphing</li></ul>	Teacher evaluation of:  Student board work  Student written calculations  Homework  Observations in class  Oral question and answer  Journal writing  Test/quiz  Pass to leave  Station activities	Textbook resources  Workbook resources  Student notebooks  Journal  Graphing Calculators  Manipulatives  Promethean Board/ laptops  Computer programs/web sites  Supplemental materials

**CONTENT:** Algebra II

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**MAJOR OBJECTIVE:** Solve quadratic equations using square roots, and factoring. Graph quadratic equations by hand and by a calculator. Represent data as a quadratic function.

<b>CURRICULUM STANDARD:</b>			
State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<b>PA Standard 2.8.11.E</b> Use equations to represent curves (e.g., lines, circles, ellipses, parabolas, hyperbolas).	Teacher will guide students to:  Graph quadratic functions.  Translate quadratic functions on a graph.	Teacher evaluation of:  Student board work  Student written calculations  Homework  Observations in class  Oral question and answer  Journal writing  Test/quiz  Pass to leave  Station activities	Textbook resources  Workbook resources  Student notebooks  Journal  Graphing Calculators  Manipulatives  Promethean Board/ laptops  Computer programs/web sites  Supplemental materials

**CONTENT:** Algebra II

**CORE CONCEPT 3:** Quadratic Equations and Functions

**MAJOR OBJECTIVE:** Solve quadratic equations using square roots, and factoring. Graph quadratic equations by hand and by a calculator. Represent data as a quadratic function.

<b>CURRICULUM STANDARD:</b>			
State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<b>PA Standard 2.8.11.S</b> Analyze properties and relationships of functions (e.g., linear, polynomial, rational, trigonometric, exponential, logarithmic).	Teachers will guide students to:  Identify quadratic functions and graphs.  Model data with quadratic functions.	Teacher evaluation of:  Student board work  Student written calculations  Homework  Observations in class  Oral question and answer  Journal writing  Test/quiz  Pass to leave  Station activities	Textbook resources  Workbook resources  Student notebooks  Journal  Graphing Calculators  Manipulatives  Promethean Board/ laptops  Computer programs/web sites  Supplemental materials

**CONTENT:** Algebra II

**CORE CONCEPT 4:** Imaginary and Complex Numbers

**MAJOR OBJECTIVE:** Define, simplify, add, subtract, multiply, and use to find the solutions of some quadratic equations.

<b>CURRICULUM STANDARD:</b>			
State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<b>PA Standard 2.1.11.A</b> Use operations (e.g., opposite, reciprocal, absolute value, raising to a power, finding roots, finding logarithms).	Teacher will guide students to:  Identify the real numbers including rational, irrational, integers, whole, and natural numbers.  Define complex and imaginary numbers  Identify complex numbers  Add, subtract, and multiply complex numbers.	Teacher evaluation of:  Student board work  Student written calculations  Homework  Observations in class  Oral question and answer  Journal writing  Test/quiz  Pass to leave  Station activities	Textbook resources  Workbook resources  Student notebooks  Journal  Graphing Calculators  Manipulatives  Promethean Board/ laptops  Computer programs/web sites  Supplemental materials

**CONTENT:** Algebra II

**CORE CONCEPT 4:** Imaginary and Complex Numbers

**MAJOR OBJECTIVE:** Define, simplify, add, subtract, multiply, and use to find the solutions of some quadratic equations.

<b>CURRICULUM STANDARD:</b>			
State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<b>PA Standard 2.8.11.N</b> Solve linear, quadratic and exponential equations both symbolically and graphically.	Teacher will guide students to:  Find complex solutions to completing the square and quadratic formula problems.	Teacher evaluation of:  Student board work  Student written calculations  Homework  Observations in class  Oral question and answer  Journal writing  Test/quiz  Pass to leave  Station activities	Textbook resources  Workbook resources  Student notebooks  Journal  Graphing Calculators  Manipulatives  Promethean Board/ laptops  Computer programs/web sites  Supplemental materials

**CONTENT:** Algebra II

**CORE CONCEPT 5:** Polynomials and Polynomial Equations

**MAJOR OBJECTIVE:** Identify, factor, add, subtract, multiply, and divide polynomials. Solve polynomial equations.

<b>CURRICULUM STANDARD:</b>			
State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p><b>PA Standard 2.1.11.A</b> Use operations (e.g., opposite, reciprocal, absolute value, raising to a power, finding roots, finding logarithms).</p>	<p>Teacher will guide students to:</p> <p>Analyze the factoring form of a polynomial.</p> <p>Write a polynomial function from its zeros.</p> <p>Divide polynomials using long division and synthetic division.</p> <p>Determine the number of permutations and/or combinations or apply the fundamental counting principle.</p>	<p>Teacher evaluation of:</p> <p>Student board work</p> <p>Student written calculations</p> <p>Homework</p> <p>Observations in class</p> <p>Oral question and answer</p> <p>Journal writing</p> <p>Test/quiz</p> <p>Pass to leave</p> <p>Station activities</p>	<p>Textbook resources</p> <p>Workbook resources</p> <p>Student notebooks</p> <p>Journal</p> <p>Graphing Calculators</p> <p>Manipulatives</p> <p>Promethean Board/ laptops</p> <p>Computer programs/web sites</p> <p>Supplemental materials</p>

**CONTENT:** Algebra II

**CORE CONCEPT 5:** Polynomials and Polynomial Equations

**MAJOR OBJECTIVE:** Identify, factor, add, subtract, multiply, and divide polynomials. Solve polynomial equations.

<b>CURRICULUM STANDARD:</b>			
State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<b>PA Standard 2.8.11.N</b> Solve linear, quadratic and exponential equations both symbolically and graphically.	Teacher will guide students to:  Solve polynomial equations by graphing and by factoring.	Teacher evaluation of:  Student board work  Student written calculations  Homework  Observations in class  Oral question and answer  Journal writing  Test/quiz  Pass to leave  Station activities	Textbook resources  Workbook resources  Student notebooks  Journal  Graphing Calculators  Manipulatives  Promethean Board/ laptops  Computer programs/web sites  Supplemental materials

**CONTENT:** Algebra II

**CORE CONCEPT 5:** Polynomials and Polynomial Equations

**MAJOR OBJECTIVE:** Identify, factor, add, subtract, multiply, and divide polynomials. Solve polynomial equations.

<b>CURRICULUM STANDARD:</b>			
State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p><b>PA Standard 2.8.11.S</b> Analyze properties and relationships of functions (e.g., linear, polynomial, rational, trigonometric, exponential, and logarithmic).</p>	<p>Teacher will guide students to:</p> <p>Classify polynomials including but not limited to monomials, binomials, and trinomials.</p> <p>Model data using polynomial functions.</p>	<p>Teacher evaluation of:</p> <p>Student board work</p> <p>Student written calculations</p> <p>Homework</p> <p>Observations in class</p> <p>Oral question and answer</p> <p>Journal writing</p> <p>Test/quiz</p> <p>Pass to leave</p> <p>Station activities</p>	<p>Textbook resources</p> <p>Workbook resources</p> <p>Student notebooks</p> <p>Journal</p> <p>Graphing Calculators</p> <p>Manipulatives</p> <p>Promethean Board/ laptops</p> <p>Computer programs/web sites</p> <p>Supplemental materials</p>

**CONTENT:** Algebra II

**CORE CONCEPT 6:** Radical Functions

**MAJOR OBJECTIVE:** Simplify, multiply, divide, add, and subtract radical expressions and binomial radical expressions.

Rationalize denominators. Solve radical equations. Graph radical functions by hand and using a calculator.

<b>CURRICULUM STANDARD:</b>			
State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<b>PA Standard 2.1.11.A</b> Use operations (e.g., opposite, reciprocal, absolute value, raising to a power, finding roots, finding logarithms).	Teacher will guide students to:  Find the square root of an integer to the nearest tenth using a calculator.  Simplify square roots.  Simplify $n$ th roots. Multiply and divide radical expressions.  Rationalize the denominators of rational expressions.  Add and subtract radical expressions.  Multiply conjugates.	Teacher evaluation of:  Student board work  Student written calculations  Homework  Observations in class  Oral question and answer  Journal writing  Test/quiz  Pass to leave  Station activities	Textbook resources  Workbook resources  Student notebooks  Journal  Graphing Calculators  Manipulatives  Promethean Board/ laptops  Computer programs/web sites  Supplemental materials

**CONTENT:** Algebra II

**CORE CONCEPT 6:** Radical Functions

**MAJOR OBJECTIVE:** Simplify, multiply, divide, add, and subtract radical expressions and binomial radical expressions.

Rationalize denominators. Solve radical equations. Graph radical functions by hand and using a calculator.

<b>CURRICULUM STANDARD:</b>			
State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<b>PA Standard 2.8.11.N</b> Solve linear, quadratic and exponential equations both symbolically and graphically.	Teacher will guide students to:  Solve radical equations.	Teacher evaluation of:  Student board work  Student written calculations  Homework  Observations in class  Oral question and answer  Journal writing  Test/quiz  Pass to leave  Station activities	Textbook resources  Workbook resources  Student notebooks  Journal  Graphing Calculators  Manipulatives  Promethean Board/ laptops  Computer programs/web sites  Supplemental materials

**CONTENT:** Algebra II

**CORE CONCEPT 6:** Radical Functions

**MAJOR OBJECTIVE:** Simplify, multiply, divide, add, and subtract radical expressions and binomial radical expressions.

Rationalize denominators. Solve radical equations. Graph radical functions by hand and using a calculator.

<b>CURRICULUM STANDARD:</b>			
State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<b>PA Standard 2.8.11.E</b> Use equations to represent curves (e.g., lines, circles, ellipses, parabolas, hyperbolas).	Teacher will guide students to:  Graph radical functions.	Teacher evaluation of:  Student board work  Student written calculations  Homework  Observations in class  Oral question and answer  Journal writing  Test/quiz  Pass to leave  Station activities	Textbook resources  Workbook resources  Student notebooks  Journal  Graphing Calculators  Manipulatives  Promethean Board/ laptops  Computer programs/web sites  Supplemental materials

**CONTENT:** Algebra II

**CORE CONCEPT 7:** Rational Exponents

**MAJOR OBJECTIVE:** Change between rational exponents and radicals in order to simplify. Use properties of exponents to simplify expressions.

<b>CURRICULUM STANDARD:</b>			
State Standard/Student Expectation	Specific Content	Assessments	Textbook resources
<b>PA Standard 2.1.11.A</b> Use operations (e.g., opposite, reciprocal, absolute value, raising to a power, finding roots, finding logarithms).	Teacher will guide students to:  Simplify expressions with rational exponents using properties of exponents.  Convert between a rational expression and an expression with a rational exponent.	Teacher evaluation of:  Student board work  Student written calculations  Homework  Observations in class  Oral question and answer  Journal writing  Test/quiz  Pass to leave  Station activities	Textbook resources  Workbook resources  Student notebooks  Journal  Graphing Calculators  Manipulatives  Promethean Board/ laptops  Computer programs/web sites  Supplemental materials

**CONTENT:** Algebra II

**CORE CONCEPT 8:** Functions

**MAJOR OBJECTIVE:** Define, add, subtract, multiply, divide, and composition of functions. Identify domain and range. Define and graph inverse functions.

**CURRICULUM STANDARD:**

State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p><b>PA Standard 2.8.11.O</b> Determine the domain and range of a relation, given a graph or set of ordered pairs.</p>	<p>Teacher will guide students to:  Determine the domain and range of a given function.</p>	<p>Teacher evaluation of:  Student board work  Student written calculations  Homework  Observations in class  Oral question and answer  Journal writing  Test/quiz  Pass to leave  Station activities</p>	<p>Textbook resources  Workbook resources  Student notebooks  Journal  Graphing Calculators  Manipulatives  Promethean Board/ laptops  Computer programs/web sites  Supplemental materials</p>

**CONTENT:** Algebra II

**CORE CONCEPT 8:** Functions

**MAJOR OBJECTIVE:** Define, add, subtract, multiply, divide, and composition of functions. Identify domain and range. Define and graph inverse functions.

<b>CURRICULUM STANDARD:</b>			
State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<b>PA Standard 2.8.11.P</b> Analyze a relation to determine whether a direct or inverse variation exists and represent it algebraically and graphically.	Teacher will guide students to:  Determine if a relation has direct or inverse variation.  Find the inverse of a relation or function.  Graph inverse relations and functions.	Teacher evaluation of:  Student board work  Student written calculations  Homework  Observations in class  Oral question and answer  Journal writing  Test/quiz  Pass to leave  Station activities	Textbook resources  Workbook resources  Student notebooks  Journal  Graphing Calculators  Manipulatives  Promethean Board/ laptops  Computer programs/web sites  Supplemental materials

**CONTENT:** Algebra II

**CORE CONCEPT 8:** Functions

**MAJOR OBJECTIVE:** Define, add, subtract, multiply, divide, and composition of functions. Identify domain and range. Define and graph inverse functions.

<b>CURRICULUM STANDARD:</b>			
State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<b>PA Standard 2.8.11.Q</b> Represent functional relationships in tables, charts and graphs.	Teacher will guide students to:  Graph various functions using paper and pencil and a graphing calculator.  Match the graph of a given function to its table or equation.	Teacher evaluation of:  Student board work  Student written calculations  Homework  Observations in class  Oral question and answer  Journal writing  Test/quiz  Pass to leave  Station activities	Textbook resources  Workbook resources  Student notebooks  Journal  Graphing Calculators  Manipulatives  Promethean Board/ laptops  Computer programs/web sites  Supplemental materials

**CONTENT:** Algebra II

**CORE CONCEPT 8:** Functions

**MAJOR OBJECTIVE:** Define, add, subtract, multiply, divide, and composition of functions. Identify domain and range. Define and graph inverse functions.

<b>CURRICULUM STANDARD:</b>			
State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<b>PA Standard 2.8.11.R</b> Create and interpret functional models.	Teacher will guide students to:  Create and interpret functional models.	Teacher evaluation of:  Student board work  Student written calculations  Homework  Observations in class  Oral question and answer  Journal writing  Test/quiz  Pass to leave  Station activities	Textbook resources  Workbook resources  Student notebooks  Journal  Graphing Calculators  Manipulatives  Promethean Board/ laptops  Computer programs/web sites  Supplemental materials

**CONTENT:** Algebra II

**CORE CONCEPT 8:** Functions

**MAJOR OBJECTIVE:** Define, add, subtract, multiply, divide, and composition of functions. Identify domain and range. Define and graph inverse functions.

<b>CURRICULUM STANDARD:</b>			
State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<b>PA Standard 2.8.11.T</b> Analyze and categorize functions by their characteristics.	Teachers will guide students to:  Determine the graph of a function by looking at the equation.	Teacher evaluation of:  Student board work  Student written calculations  Homework  Observations in class  Oral question and answer  Journal writing  Test/quiz  Pass to leave  Station activities	Textbook resources  Workbook resources  Student notebooks  Journal  Graphing Calculators  Manipulatives  Promethean Board/ laptops  Computer programs/web sites  Supplemental materials

**CONTENT:** Algebra II

**CORE CONCEPT 8:** Functions

**MAJOR OBJECTIVE:** Define, add, subtract, multiply, divide, and composition of functions. Identify domain and range. Define and graph inverse functions.

**CURRICULUM STANDARD:**

State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p><b>PA Standard 2.1.11.A</b> Use operations (e.g., opposite, reciprocal, absolute value, raising to a power, finding roots, finding logarithms).</p>	<p>Teacher will guide students to: Add, subtract, multiply, divide functions.</p> <p>Find the composite of two functions.</p>	<p>Teacher evaluation of:</p> <p>Student board work</p> <p>Student written calculations</p> <p>Homework</p> <p>Observations in class</p> <p>Oral question and answer</p> <p>Journal writing</p> <p>Test/quiz</p> <p>Pass to leave</p> <p>Station activities</p>	<p>Textbook resources</p> <p>Workbook resources</p> <p>Student notebooks</p> <p>Journal</p> <p>Graphing Calculators</p> <p>Manipulatives</p> <p>Promethean Board/ laptops</p> <p>Computer programs/web sites</p> <p>Supplemental materials</p>

**CONTENT:** Algebra II

**CORE CONCEPT 9:** Rational Expressions

**MAJOR OBJECTIVE:** Simplify, add, subtract, multiply, and divide rational expressions and solve rational equations.

<b>CURRICULUM STANDARD:</b>			
State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<b>PA Standard 2.1.11.A</b> Use operations (e.g., opposite, reciprocal, absolute value, raising to a power, finding roots, finding logarithms).	Teacher will guide students to:  Simplify rational expressions.  Multiply, divide, add, and subtract rational expressions.  Simplify complex fractions.  Find the Greatest Common Factor and Least Common Multiple for sets of monomials.	Teacher evaluation of:  Student board work  Student written calculations  Homework  Observations in class  Oral question and answer  Journal writing  Test/quiz  Pass to leave  Station activities	Textbook resources  Workbook resources  Student notebooks  Journal  Graphing Calculators  Manipulatives  Promethean Board/ laptops  Computer programs/web sites  Supplemental materials

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State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<b>PA Standard 2.8.11.N</b> Solve linear, quadratic and exponential equations both symbolically and graphically.	Teacher will guide students to:  Solve rational equations.  Use rational equations in solving problems.	Teacher evaluation of:  Student board work  Student written calculations  Homework  Observations in class  Oral question and answer  Journal writing  Test/quiz  Pass to leave  Station activities	Textbook resources  Workbook resources  Student notebooks  Journal  Graphing Calculators  Manipulatives  Promethean Board/ laptops  Computer programs/web sites  Supplemental materials

**V. EXPECTED LEVELS OF ACHIEVEMENT**

A. Students are expected to reach the proficient level (D or above) of achievement, including all of the skills noted in the specific content area of this curriculum.

B. Grading system for Algebra II classes is as follows:

<b>Grading Scale</b>	
A	90% - 100%
B	80% - 89%
C	70% - 79%
D	60% - 69%
F	0% - 59%

C. Each student's grade will be determined at the conclusion of each marking period by dividing the total number of points earned by the total number of points possible. Progress notes will be issued half way through each marking period for those students who are performing below 70%. Students' grades will be posted and updated on Edline weekly.