Algebra 3 and Trigonometry

05040446

General Information

Credits: 1.0	**Grades: 11, 12**
Unweighted:	**Prerequisite: Algebra 2 or teacher rec.**
Length: 1 year	
Format: Meets Daily	

Course Description

Algebra 3 is an academic level course.

Academic level courses will feature a slower pace with moderate workload and the highest degree of teacher-guidance to assist in the mastery of the material. These courses will cover material necessary to prepare students for the PSSA tests and Keystone Exams as well as prepare the student to take the SAT test if post secondary education is desired; however, some independent math remediation may be necessary.

Algebra 3 is intended to complete the topics of Algebra not developed in Algebra 2. In addition, the course will review, reinforce and strengthen the concepts and skills studied in Algebra 2 with emphasis on equation and inequality solving. The new topics will include but not be limited to complex numbers, exponential and logarithmic functions, and sequences and series. Trigonometry will be introduced through right triangles and extended to include the circular functions.

Course Objectives:

At the end of the first marking period, students should be able to successfully manage the following skills:
- Solve linear equations by using the addition and/or multiplication properties of equality
- Solve linear equations by using the distributive property
- Solve linear inequalities by using the addition and/or multiplication properties of equality
- Solve linear inequalities by using the distributive property
- Solve linear inequality $a \le x \le b$
- Solve application problems with inequalities
- Define absolute value
- Solve various absolute value problems, including special cases of absolute value and inequalities
- Distinguish between independent and dependent variables
- Define and identify relations and functions
- Find domain and range for specific functions and/or relations
- Use function notation, and identify functions defined by graphs and equations
- Solve 2 equation linear systems by graphing, substitution and elimination
- Solve special systems (dependent and inconsistent)
- Use a graphing calculator to assist in solving systems of equations

- Define and use the rules of exponents for products & quotients and the power rule
- Define and use negative exponents and the zero power
- Simplify exponential expression
- Define polynomials
- Find the degree of a polynomial
- Add, subtract and multiply polynomials
- Divide polynomials, through both long division and synthetic division
- Evaluate polynomial functions through function notation
- Define and use composite functions
- Factor using GCF; by grouping; factoring trinomials; factoring differences of squares; factoring perfect square trinomials
- Using the zero product property
- Quadratic Formula

At the end of the second marking period, students should be able to successfully manage the following skills:
- Define rational functions and describe their domains
- Write rational expressions is lowest terms
- Find a least common denominator
- Perform standard operations with rational expressions
- Determine the domain of the variable in a rational equation
- Solve rational equations
- Recognize the graph of a rational function
- Find roots of numbers
- Solve radical equations
- Simplify the square root of negative numbers
- Manipulate and use "i"

At the end of the third marking period, students should be able to successfully manage the following skills:
- Define an exponential function
- Graph an exponential function
- Solve exponential equations
- Use exponential functions with growth and decay
- Define a logarithm
- Convert between exponential and logarithmic forms
- Evaluate logarithms
- Solve logarithmic equations
- Identify sequences
- Evaluate sequences
- Recognize and use sigma notation
- Identify arithmetic and geometric sequences and series
- Understand the basic terminology of angles
- Find measures of complementary and supplementary angles
- Calculate with degrees, minutes, and seconds
- Find the measures of coterminal angles
- Classify triangles
- Find the unknown angles and side lengths in similar triangles
- Find the values of the six trigonometric functions of a triangle
- Solve right triangles with Pythagorean theorem

At the end of the fourth marking period, students should be able to successfully manage the following skills:
- Define and find the six trigonometric function values for an angle, including quadrantal angles
- Ability to use the definitions of the trigonometric functions to find both special angles and points on the unit circle.
- Use the Pythagorean and quotient identities to find function values

- Identify and use reciprocal identities to find function values
- Define and use cofunction identities
- Use special right triangles to identify points on the unit circle for 30^0, 45^0, 60^0 angles
- Identify reference angles and positive/negative angles
- Identify coterminal angles
- Use trigonometric applications
- Convert from degrees to radians and from radians to degrees
- Use the Law of Sines/Law of Cosines to solve triangle perimeter problems

Common Assessments:

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1. **Mid-Term**
2. **Final**

Major Units of Study:

MARKING PERIOD ONE

- **LINEAR EQUATIONS AND INEQUALITIES IN 1 AND 2 VARIABLES, WITH GRAPHING**
- **EXPONENTS, POLYNOMIALS AND POLYNOMIAL FUNCTIONS**
- **FACTORING**

MARKING PERIOD TWO

- **RATIONAL EXPRESSIONS AND FUNCTIONS**
- **ROOTS, RADICALS AND ROOT FUNCTIONS**

MARKING PERIOD THREE

- **EXPONENTIAL AND LOGARITHMIC FUNCTIONS**
- **SEQUENCES AND SERIES**

MARKING PERIOD FOUR

- **RIGHT TRIANGLE TRIGONOMETRY**
- **TRIGONOMETRIC FUNCTIONS**
- **TRIGONOMETRIC APPLICATIONS**

Materials & Texts

Lial, Margaret L., Hornsby, John, (2011). *Algebra and trigonometry for college readiness.* Boston, MA: Pearson Education, Inc.   ISBN 0-13-136626-2