



RADNOR TOWNSHIP SCHOOL DISTRICT
Course Overview
Advanced Algebra III - 05040444



General Information

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

Course Description

Advanced Algebra 3 is a college-preparatory course.

Advanced Algebra 3 is a College Preparatory level which features moderate pacing and workload with teacher guidance to assist in the mastery of the material. Students enrolled on this level should be seeking to satisfy college requirements/expectations of mathematics course but not necessarily have an interest in pursuing math related college majors.

This course is designed for the students who need to strengthen their knowledge and skill sets of Advanced Algebra 2 before taking a full year course in Trigonometry. Time will be spent reviewing, strengthening and reinforcing skills and concepts involving functions, equations, inequalities and applications. Additional topics will include exponential and logarithmic functions, sequences and series and complex and imaginary numbers. Trigonometry will be introduced through the unit circle and extended to include solving triangles.

Course Objectives:

At the end of the first marking period, students should be able to successfully manage the following skills:

- Solve systems of equations in two variables by graphing, substitution and linear combination
- Solve problems by translating them to a system of equations
- Determine whether a system of equations has 0, 1 or infinite number of solutions, and whether lines are parallel or perpendicular
- Graph and solve systems of inequalities
- Evaluate and simplify polynomial functions
- Add, subtract, and multiply polynomial functions
- Recognize and factor certain polynomials
- Solve equations using the zero-product property
- Add, subtract, multiply, divide and simplify rational expressions

At the end of the second marking period, students should be able to successfully manage the following skills:

- How to add, subtract, multiply and divide complex rational expressions
- How to factor and rationalize radical expressions
- Ability to solve rational equations
- Ability to solve work and motion problems using rational equations
- Find the constant of variation and an equation of variation for direct and inverse variation problems given certain information, and then solve the problem
- How to add, subtract, multiply, simplify (by factoring) and rationalize radical expressions
- Will be able to find principal square roots and find odd/even n th roots
- Will write expressions with rational exponents as radical expressions, and vice versa.

- Will simplify expressions containing negative rational exponents
- Will be able to use rational exponents to simplify radical expressions
- Will be able to solve problems with radicals and radical equations
- How to add, subtract, multiply and find the conjugate of imaginary and complex numbers
- Ability to transform a graph given either coordinates or a function
- Problem-solve using quadratic functions

At the end of the third marking period, students should be able to successfully manage the following skills:

- How to find the length and midpoint of a segment
- How to find the equation of a conic section (circle, ellipse, hyperbola, parabola) given certain characteristics
- How to graph a conic section
- How to identify conic sections from their equations or graphs
- How to find the six trigonometric function values for an angle
- How to find the reference angle of a rotation and use it to find trigonometric function values
- How to convert from degrees to radian measures and back again
- How to graph trigonometric functions (sin, cos, tan and cot) with transformations

At the end of the fourth marking period, students should be able to successfully manage the following skills:

- Recognize and solve problems that require the Law of Sines and/or the Law of Cosines
- Solve basic trigonometric equations that require a minimum of algebraic manipulation with some reference to Pythagorean identities
- Take inverses of linear functions
- Recognize that the exponential and logarithmic functions are inverses of each other
- Take the inverse of an exponential function, and conversely take the inverse of a logarithmic function
- Graph an exponential and/or a logarithmic function with various transformations
- Solve exponential and logarithmic problems using the properties of exponents and the properties of logarithms
- Solve specific applications of exponents and logarithms
- Recognize and articulate the difference between a sequence and a series
- Given a reasonable sequence, be able to write the next three terms in that sequence
- Recognize sigma notation, and given specific directions, be able to write out and sum the required terms
- Recognize an arithmetic sequence; be able to collect all required terms for its algorithm and be able to construct a particular term from that information.
- Recognize an arithmetic series; be able to collect all required terms for its algorithm and be able to construct a particular sum from that information.
- Recognize a geometric sequence; be able to collect all required terms for its algorithm and be able to construct a particular term from that information.
- Recognize a geometric series; be able to collect all required terms for its partial sum algorithm and be able to construct a particular sum from that information.
- Recognize an infinite **convergent** geometric series; be able to collect all required terms for its algorithm and be able to construct a particular sum from that information.

Common Assessments:

Common Assessments:

- Assignment sheets will be distributed periodically throughout the school year. Homework will be

assigned on a daily basis. Individual assignments for each chapter can be viewed on the Mathematics Department page of Radnor High School's web site.

- Quizzes and tests will be given each chapter to measure understanding. Homework and classwork assignments will also be graded throughout the course.
- Departmental Midterm and Final Exam.

Major Units of Study:

Marking Period 1:

- **SYSTEMS OF LINEAR EQUATIONS**
- **POLYNOMIALS – EXPRESSIONS AND EQUATIONS**
- **RATIONAL EXPRESSIONS AND EQUATIONS**

Marking Period 2:

- **RATIONAL EXPRESSIONS – SOLVING, COMPLEX AND VARIATION**
- **POWERS, ROOTS AND COMPLEX NUMBERS**
- **QUADRATIC FUNCTIONS AND TRANSFORMATIONS**

Marking Period 3:

- **CONIC SECTIONS**
- **TRIGONOMETRIC FUNCTIONS**
- **TRIGONOMETRIC GRAPHS**

Marking Period 4:

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

Materials & Texts

Smith, Stanley A., Randall, Charles I., Dossey, John A., Bittinger, Marvin L. (2001). *Algebra 2 with Trigonometry*. Upper Saddle River, NJ: Prentice ISBN 0-13-051968-5

Summer Assignment

None