



RADNOR TOWNSHIP SCHOOL DISTRICT  
Course Overview  
Honors Algebra 2 (05040432)



### General Information

Prerequisite: 8th grade Algebra 1 with a “C” and Geometry Honors

Length: Full Year

Format: meets daily for one period

### Course Description

**Honors level** courses are intended for the motivated math student who is very good with mathematics but needs more teacher guidance to assist in the mastery of the material. The course will involve accelerated pacing and a demanding workload with some written explanations expected. Students on this level will be prepared to take AP Calculus AB.

This course reviews and extends the number system, formulas, equations and graphs. Subject matter includes quadratics, radicals, exponents, and complex numbers. An emphasis is placed on both the development of the concept of function and graphing functions using a transformational approach. Logarithms, exponential functions, theory of equations and sequences and series are introduced during the course. Students are challenged to apply skills to new problems and to connect skills and concepts. Students are expected to handle a demanding workload.

### Course Objectives:

At the end of the 1st quarter, student should be able to successfully complete the following skills:

- Evaluate and write sigma notations
- Calculate absolute values
- Solve equations by using properties of equality
- Express solutions of equations as ordered pairs
- Apply properties of inequality
- Solve linear inequalities in one variable
- Graph solutions of inequalities on the number line
- Use midpoint and distance formulas
- Understand function notation
- Find domain and range of a function
- Multiply a matrix by a scalar
- Solve matrix equation
- Add, subtract and multiply matrices
- Calculate probability
- Use point-slope, slope-intercept and general linear forms of equations of lines
- Use slopes to determine if lines are perpendicular or parallel
- Solve system of linear equation graphically and algebraically
- Graph linear inequalities
- Find union and intersection of sets defined by inequalities
- Write equations that represent linear functions
- Recognize direct variation
- Fit a line to data by using linear regression in the calculator
- Recognize and graph compound (piecewise) functions
- Convert absolute value functions into piecewise functions and vice versa

- Multiply to form quadratics
- Remove common factors from expressions
- Factor trinomials and special products
- Graph quadratic functions
- Find the real zeros of quadratic functions
- Solve quadratic equations by factoring and quadratic formula
- Complete the square to find the maximum/minimum value of a quadratic function
- Complete the square to solve quadratic equations
- Analyze and solve problems involving maximum and minimum values
- Analyze and solve projectile motion

At the end of the 2nd quarter, student should be able to successfully complete the following skills:

- Represent relations
- Recognize functions
- Identify restrictions on the domain of a function
- Interpret composite functions
- Recognize inverse functions
- Find the inverse of a given function
- Recognize the relationship the graph of a function and its inverse
- Perform operations on the inputs and outputs of functions
- Use the factorial, permutation and combination functions
- Convert recursive definition to an equivalent closed form definition
- Graph absolute value functions
- Stretch, shrink, reflect and shift graphs
- Reflect objects graphed on a coordinate system
- Recognized symmetry with respect to a line or a point

At the end of the 3rd quarter, student should be able to successfully complete the following skills:

- Graph cubic, quartic, reciprocal and exponential functions
- Use system of equations to solve problems
- Solve systems of equations in three unknowns
- Graph equations that contains three variables
- Graph systems of inequalities
- Solve direct, inverse, joint and combined variation problems
- Solve nonlinear systems
- Factor by grouping
- Factor sum/difference of two cubes
- Solve equations by factoring
- Solve inequalities by factoring and interval testing
- Apply the properties of exponents to expressions with rational exponents
- Solve radical equations

Perform operations on complex numbers

At the end of the 4th quarter, student should be able to successfully complete the following skills:

- Divide a polynomial by a binomial
- Apply the remainder and factor theorems
- Perform synthetic and long divisions
- Find zeros of functions by factoring and using the quadratic formula
- Use the calculator to find the rational zeros of a function
- Determine the number of complex zeros a polynomial function has
- Determine the sum and product of the roots of a quadratic equation
- Apply the conjugate zero theorem

- Simplify, multiply, add, subtract and divide rational expressions
- Solve rational equations and inequalities
- Simplify complex fractions
- Graph exponential and logarithmic functions
- Use the properties of logarithms
- Solve exponential and logarithmic equations
- Use exponential and logarithmic functions as mathematical models
- Use appropriate base (10 or e) in certain problems
- Use sigma notation to express a series
- Find the value of an infinite series
- Compute any term in an arithmetic sequence
- Compute arithmetic means
- Evaluate arithmetic series
- Compute any term in a geometric sequence
- Compute geometric means
- Evaluate finite and infinite geometric series

### **Common Assessments:**

Grades will be based on quizzes and tests. In addition, teachers may use homework, group activities, and/or projects for grading purposes. All students will take departmental midyear and final exams. The Radnor High School grading system and scale will be used to determine letter grades.

### **Major Units of Study:**

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### ***Materials & Texts***

#### **MATERIALS**

TI-8\_ Graphing Calculator & Supplemental Worksheets

#### **TEXTS**

Algebra 2 & Trigonometry, John Benson, McDougal Littell/Houghton Mifflin, 1991

### ***Summer Assignment***

N/A