

## Algebra 1 Syllabus

### RCAS Policies/Procedures

Students will be required to follow all RCAS policies and procedures. To view the RCAS High School Student Handbook, click [handbook](#).

### Course Description

The fundamental purpose of Algebra I is to formalize and extend the mathematics that students learned in the middle grades. Students will deepen and extend understanding of properties and operations of the real number system, evaluating rational algebraic expressions, solving and graphing first-degree equations and inequalities, translating word problems into equations, operations with and factoring of polynomials and solving simple quadratic equations.

### Grading

Official grades will be kept in Skyward.

Points shall be awarded for assignments, quizzes, and tests. Points will be awarded and collected cumulatively through the year.

### Textbook

Daniel Kennedy et al. *enVision Algebra 1*, Pearson, 2018.

### Instructional Resources

[www.SavvasRealize.com](http://www.SavvasRealize.com) – online textbook and homework site. Paper text available on request.

[www.desmos.com](http://www.desmos.com) – online calculator, graphing calculator, matrix calculator

TI84 graphing calculator

Various resources for each group to produce project-based learning projects

### Essential Questions

1. What general strategies can you use to solve simple equations and inequalities?
2. Why is it useful to have different forms of linear equations?
3. How can linear functions be used to model situations and solve problems?
4. How do you use systems of linear equations and inequalities to model situations and solve problems?
5. How do you use piecewise-defined functions to model situations and solve problems?
6. How do you use exponential functions to model situations and solve problems?
7. How do you work with polynomials to rewrite expressions and solve problems?
8. How can you use sketches and equations of quadratic functions to model situations and make predictions?
9. How do you use quadratic equations to model situations and solve problems?
10. What are some operations on functions that you can use to create models and solve problems?
11. How do you use statistics to model situations and solve problems?

## Essential Learning Intentions

### Topic 1:

- Reason about operations on real numbers
- Create and solve linear equations with one variable
- Write and solve equations with a variable on both sides to solve problems
- Rewrite and use literal equations to solve problems
- Solve and graph inequalities
- Write and solve compound inequalities
- Write and solve absolute value equations and inequalities

### Topic 2:

- Write and graph linear equations using slope-intercept form
- Write and graph linear equations in point-slope form
- Write and graph linear equations in standard form
- Write equations of parallel and perpendicular lines

### Topic 3:

- Determine whether a relation is a function
- Identify, evaluate and write linear equations
- Transform linear functions
- Identify and describe arithmetic sequences
- Use a scatter plot to describe the relationship between two data sets
- Find the line of best fit for data set and evaluate its goodness of fit

### Topic 4:

- Use graphs to find approximate solutions to systems of equations
- Solve a system of equations using the substitution method
- Solve a system of equations using the elimination method
- Graph solutions to linear inequalities in two variables
- Graph and solve a system of linear inequalities

### Topic 6:

- Use properties of exponents to solve equations with rational exponents
- Describe and graph exponential functions
- Use exponential functions to model situations and make predictions
- Identify and describe geometric sequences
- Perform, analyze and use transformations of exponential functions

### Topic 7:

- Combine like terms to simplify polynomials
- Multiply two polynomials
- Use patterns to multiply binomials
- Factor a polynomial
- Factor a quadratic trinomial
- Factor a quadratic trinomial when a isn't equal to 1
- Factor special trinomials

**Topic 8:**

- Identify key features of the graph of the quadratic parent function
- Graph quadratic functions using the vertex form
- Graph quadratic functions using the standard form
- Use quadratic functions to model real-world situations
- Determine whether a linear exponential or quadratic function best models a data set

**Topic 9:**

- Use graphs and tables to find solutions of quadratic equations
- Find the solution of a quadratic equation by factoring
- Write equivalent radical expressions
- Solve quadratic equations by taking square roots
- Use completing the square to solve quadratic equations
- Use the quadratic formula to solve quadratic equations
- Solve a system with linear and quadratic equations

**Topic 10:**

- Describe the key features of the square root function
- Identify the key features of the cube root function
- Identify the common features of a function when given an equation or graph
- Graph and analyze transformations of functions
- Change functions to compress or stretch their graphs
- Add, subtract, and multiply functions
- Use inverse functions to solve problems

**Topic 11:**

- Organize and understand data using dot plots, histograms and box plots
- Use measures of center and spread to compare data sets
- Interpret shapes of data displays representing different types of data distributions
- Quantify and analyze the spread of data
- Organize data in two-way frequency tables and use them to make inferences