Course Syllabus

Course Title: Algebra 1 AB
School Year: 2024-2025
Semester(s): 1 and 2
Grade Level(s): 9, 10, 11, 12
Course Day(s) and Times: Mondays and Wednesdays, 9:00-10:00 am PST

Teacher Information

- **Name:** Ruth Maas
- **Email:** ruth.maas@brancheslearning.org
- **Office Hours:** By appointment only
- **Phone Numbe**r: 619-709-1083
- **Branches Learning Main Office Number**: (323) 955-0114

Class Materials – https://brancheslearning.org/product/algebra-1/#Materials

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Course Description

Algebra 1 is a standards-based class that teaches students to think critically and develop algebraic reasoning and problem-solving skills. Projects and other assignments build algebraic literacy and encourage students to find solutions to complex problems.

Students deepen their understanding of linear and quadratic functions, systems of equations, and algebraic expressions. They learn to apply math concepts to real-world problems and tap into critical thinking as they work independently and collaboratively with their peers.

Course Units

Semester 1: Units 1-5

Unit 1
Real Numbers (N-RN) **and Quantities** (N-Q)
- Properties of Real Numbers, Positive and Negative Real Numbers
- Expanding the Properties of of Real Numbers
- Properties of Fractions and Fraction Notation
- Adding and Subtracting, Multiplying and Dividing Real Numbers
- Exponential notation and Order of Operations
- Solutions using correct units of measurement
- Interpret parts of an expression such as terms, factors, and coefficients

Unit 2: Introduction to Algebra (N-RN)
- What is a Variable? Why Use Variables?
- Solving one-step Equations with Variables
- Solving two-step equations
- Linear equations and variables

Unit 3: Equations, Inequalities, and Problem Solving (A-SSE)
- Problem solving strategies
- Applications using fractions, decimals, and percentages
- Seeing structures (patterns) in algebraic equations and formulas
- Arithmetic with polynomials and rational expressions
- Reasoning with equations and inequalities
- Graphing inequalities

Unit 4: Arithmetic with Polynomials and Rational Expressions (A-APR)
- Add, subtract, multiply and dividing monomials and polynomials
- Perform arithmetic operations on polynomials
- Understand that polynomials form a system analogous to integers

Unit 5: Creating Equations (A-CED)
- Create equations using variables–either with one variable or two or more variables
- Create equations and inequalities in one variable including ones with absolute value and use them to solve problems
- Include equations arising from linear and quadratic functions, and simple rational and exponential functions

Semester 2: Units 6-10

Unit 6: Reasoning with Equations and Inequalities (A-REI)
- Explain each step in solving a simple equation assuming the original equation has a solution
- Construct a viable argument to justify a solution method
- Solve linear equations and inequalities in one variable, including with coefficients represented by letters
- Solve one-variable equations and inequalities involving value, graphing the solutions and interpreting them in context
- Solve quadratic equations in one variable by inspection, taking square roots, completing the square, and using the quadratic formula, and factoring
- Understand what the imaginary number "i" represents
- Recognize when the quadratic formula gives complex solutions and write them as $a \pm bi$ for real numbers a and b

Unit 7: **Solving Systems of Equations** (A-CED)
- Solving Systems of Equations By Graphing
- Solving Systems of Equations Using the Substitution Method
- Solving Systems of Equations Using the Elimination Method
- Write a system of equations in point-slope form

Unit 8: **Interpreting, Solving, and Graphing Functions** (F-IF)
- Linear Equations
  - Linear versus nonlinear functions
  - Solve linear equations and find y-intercepts
  - Graph linear equations using the slope-intercept form or by using a values table
  - Interpreting and recognizing types of parent functions
- Quadratic, Exponential, Absolute Value, and Constant Functions
  - Practice solving and graphing quadratic equations
  - Practice solving and graphing exponential functions and models
  - Identify, solve, and graph quadratic equations with/without the quadratic formula
  - Graph equation that include absolute value
  - Graph equations that include constants

Unit 9: **Building Functions** (F-BF)
- Write a function that describes the relationship between two quantities
- Write arithmetic and geometric sequences to model situations
- Solve an equation of the form $f(x) = c$ for a simple function f that has an inverse and write an expression for the inverse.
- Practice graphing the inverse of a simple function

Unit 10 **Interpreting Data** (S-ID)
- Summarize, represent, and interpret data on a single count or measurement variable
- Represent data with plots on the real number line (dot plots, histograms, and box plots)
- Summarize categorical data for two categories in two-way frequency tables
- Interpret relative frequencies in the context of the data (including joint, marginal, and conditional relative frequencies)
- Recognize possible associations and trends in the data
- Interpret linear models by analyzing slope and the y- intercept
- Compute (using technology) and interpret the correlation coefficient of a linear fit
- Distinguish between correlation and causation

Course Expectations: Be prepared, attend from a quiet place, have your materials ready, have your camera on, be on time, participate, submit work in a timely fashion, treat others with respect, ask for help when needed.

Grading Scale
High School, Grades 9-12
- A = 90% -100%
- B = 80%-89%
- C = 70%-79%
- D = 60%-69%
- F = 0%-59%

Final grades are determined by the quality and completion of assignments, attendance, and participation.

Important Branches Learning Policy Information

Camera Policy

Branches Learning requires students to keep their cameras on during live classes unless otherwise instructed by the teacher. Exceptions can be made in rare circumstances if the course teacher, supervising teacher (HST), and the parent all approve a camera waiver.

Headset Policy

Students attending live classes from a shared space must have a headset with a microphone to ensure the class is not disrupted by background noise.

Attendance Policy

Absences must be reported to the course instructor via email or sent to info@brancheslearning.org. Class recordings are available upon requests.
Attendance and participation are part of the final grade. Students who miss more than 40% of live classes may fail the course. Exceptions may be made if a pre-approved plan is in place.

Late Work

Assignments turned in after the due date will result in a lower grade unless pre-approved by the instructor.