Algebra I

Ivy Collegiate School

2020-2021

Department:	Mathematics	**Time:**	MTuW 11:20 – 12:20
Email:	mathematics@ivycollegiateschool.org	**Place:**	808.

Course References: This is a list of various interesting and useful books and online resources that were used in the construction of the course. You are not required to purchase all of these (only those noted as such), but they may be useful for occasional consultation. (Note: They are available in the restricted library.)

- Edward B. Burger, David J. Chard, Earlene J. Hall, Paul A. Kennedy, Steven J. Leinwand, Freddie L. Renfro, Dale G. Seymour, and Bert K. Waits, *Algebra I*, Holt, Rinehart and Winston, 1st ed., 2007. REQUIRED.

- Edward B. Burger, David J. Chard, Earlene J. Hall, Paul A. Kennedy, Steven J. Leinwand, Freddie L. Renfro, Dale G. Seymour, and Bert K. Waits, *Algebra II*, Holt, Rinehart and Winston, 1st ed., 2007.

- Richard S. Hammond and Piseth Chea, *Algebra: Practice Workbook*, Mathematical Olympiad Series, 2018.

Objectives: Algebra I at ICS is an intensive integrated course that covers the full-breadth of a traditional Algebra I course while introducing students to select topics from Algebra II as well. Algebra I students will extend topics introduced in Elementary Mathematics by learning algebraic concepts through both theory and applications. Modeling and real-world problems are introduced throughout the course in the form of both problem sets and projects. Students will begin with a review of the properties of real numbers before moving on to further topics in algebra and algebraic reasoning, including quadratic equations, polynomials, functions, logarithms, conic sections, triangle trigonometry, trigonometric functions, normal distributions and sampling methods, and sequences. This course prepares students for Precalculus.

Co-/Prerequisites: Elementary Mathematics IV or Pre-Algebra (else Faculty recommendation)

Course Policy:

- Students must have a TI Nspire CX CAS.

Class Policy:

- Regular attendance is essential and expected.

- Students must show all work to receive credit for their assignments.

Important Dates:

Final Examination, Semester I . . . . Dec 22, 2020
Final Examination, Semester II . . . . June 1, 2021

Algebra I Course Outline:

Week One . . . . The Real number system
Week Two . . . . Order of operations and variables
Week Three . . . . Connecting algebra to geometry
Week Four . . . . Simplifying expressions
Week Five . . . . Ratios and proportions
Week Six . . . . Percent
Week Seven . . . . Inequalities
Week Eight . . . . REVIEW
Week Nine . . . . Functions and relations
Week Ten . . . . Linear functions
Week Eleven . . . . Systems of equations and inequalities
Week Twelve . . . . Exponents
Week Thirteen . . . . Polynomials
Week Fourteen . . . . REVIEW
Week Fifteen . . . . Factoring techniques
Week Sixteen . . . . Quadratic functions and equations
Week Seventeen . . . . Exponential and radical functions
Week Eighteen . . . Rational functions and equations, methods of division
Week Nineteen . . . . Absolute value and piecewise functions
Week Twenty-one . . . . Imaginary and complex numbers
Week Twenty-two . . . . Inverse functions and operations
Week Twenty-three . . . . Exponential growth & decay
Week Twenty-four . . . . Conic sections
Week Twenty-five . . . . Triangle relationships
Week Twenty-six . . . . Triangle trigonometry
Week Twenty-seven . . . . The Unit Circle
Week Twenty-eight . . . . Trigonometric functions
Week Twenty-nine . . . . Introduction to statistics
Week Thirty . . . . Data analysis
Week Thirty-one . . . . Probability
Week Thirty-two . . . . Concepts in combinatorics
Week Thirty-three to Thirty-seven . . . . PROJECTS
Week Thirty-eight . . . . PROJECTS FINALS

Grading Policy: Homework and quizzes (60%), Finals and Project (40%)

Academic Honesty: Students are expected to abide by the policies regarding Academic Honesty as laid out in the ICS Student Handbook. Any violations will be forwarded for administrative review and the possible imposition of academic penalties.