

Course Name: Algebra II

Course Code: H2201 Grades: 10-11 Level: Accelerated Year: 5X Credits: 5

This course is designed for the academically talented student with a strong mathematics background and self-motivation. The course extends student understanding of Algebra. Real and complex number properties are studied using the symbolic system of algebra. Moving beyond linear equations and functions, students study and apply quadratic, exponential, trigonometric, and rational functions. Applications of algebra in transformational geometry, statistics, probability, and logic are developed.

Prerequisite: Algebra and Analytic Geometry

Course Proficiencies: The following is a list of the proficiencies that describe what students are expected to know and be able to do as a result of successfully completing this course. The proficiencies are the basis of the assessment of student achievement. The learner will demonstrate the ability to:

1. Apply fundamental algebra skills. (Using the real number line to graph and order real numbers, properties of real numbers, evaluate an algebraic expression, solve linear equations and inequalities.)
2. Fit a model to data. (linear and quadratic functions) *A-CED.2, A-REI.10, F-BF.1c*
3. Solve systems of linear inequalities. *A-REI.12, A-CED.3, A-REI.11*
4. Perform transformations of linear, quadratic, absolute value, and square root functions. *F-BF.3*
5. Identify, add, subtract, and multiply imaginary and complex numbers. *N-CN.1,2*
6. Solve, graph, and analyze quadratic equations by finding square roots, factoring, completing the square, or using the Quadratic Formula and apply them in real-life problems. *N-CN.7, A-SSE.3a & b, A-REI.4, F-IF.7a, F-IF.8a, A-APR.3*
7. Discuss and use explicit and recursive formulas for arithmetic and geometric sequences. *F-IF.3, F-BF.1a, F-BF.2, F-LE.2*
8. Perform operations with functions; Use composite functions to explore inverse functions and their properties (domain and range). *F-BF.1b & c, F-IF.2-5, F-BF.4a & c*
9. Perform matrix operations and solve linear systems using matrices. *N-VM.6-10, A-REI.9*
10. Explore piece-wise functions. *F-IF.7b*
11. Graph exponential functions and use their properties to solve real-life problems (compound interest, growth and decay). *F-LE.1, F-LE.3, F-LE.5, A-SSE.1b, F-BF.5*
12. Use properties of radicals and/or rational exponents to solve equations and apply to real-life problems. *N-RN.1, N-RN.2, A-SSE.3c, F-IF.8b*
13. Solve problems and analyze graphs of direct, indirect, combined and joint variations; apply real world applications. *A-CED.2*
14. Perform operations with rational expressions and solve rational equations. *A-APR.7, A-REI.2*
15. Add, subtract, and multiply polynomials. *A-APR.1*

Algebra II Proficiencies – cont'd.

16. Use the relationship between the sine and cosine of complementary angles to solve real-life problems. ***G-SRT.7, G-SRT.8, G-CO.8***
17. Use inverse trigonometric functions to solve right triangles. ***G-SRT.8***
18. Measure angles in standard position using degree measure. Construct figures inscribed in a circle. ***G-CO.13***
19. Use histograms, box and whisker plots, and line plots to represent data. ***S-ID.1***
20. Construct and interpret two-way frequency tables. ***S-CP.4***
21. Analyze data sets relative to shape, center, and spread. ***S-ID.2, S-ID.3***
22. Distinguish between permutations and combinations.
23. Find the probability of independent and dependent events. ***S-CP.3, S-CP.5***
24. Apply mathematics in practical situations and in other disciplines.
25. Use critical thinking skills to make sense of problems, solve them, and communicate processes. ***CRP 2, 4 & 8.***
26. Use technology to gather, analyze, and communicate mathematical information.
8.1.12.A.3, 8.1.12.C.1

Assessment: Evaluation of student achievement in this course will be based on the following:

- A. Tests
 - B. Projects
 - C. Classwork
 - D. Maintaining a folder/notebook
- A. Tests are usually given at the end of a unit. These generally require a full period to complete.
- B. During the course, special projects such as research papers, outlines, surveys, and computer-based projects may be assigned to students. These activities are major in scope. The grades on projects will count as major grades when determining the course grade.
- C. Classwork, evidenced by completed and carefully presented daily work and by the meeting of daily responsibilities, is an essential part of learning. The day-to-day work included as classwork may involve quizzes, the written results of learning activities, graded homework, and assessments of learning observed during class. The more a student is involved, the more learning that takes place.
- D. Folders/Notebooks must be maintained by students. These typically include notes and assignments kept in an organized fashion.

Board Adopted Materials:

Textbook Title: Holt McDougal Algebra 2

Author: Burger, Chard, Kennedy, Leinwand, Renfro, Roby, & Waits

Publisher: Houghton Mifflin Harcourt Publishing Company

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