



MATHEMATICS 2 - 2A*

*Math 2A explores these same concepts in greater depth and additional topics may be included for exploration and investigation.

Numerals in parentheses designate individual content standards that are eligible for assessment in whole or in part. Underlined numerals (e.g., 1) indicate standards eligible for assessment on two or more end-of-course assessments.

Course emphases are indicated by:

- ⊙ Major Content;
- + Supporting Content;
- ✓ Additional Content.

Not all content standards in a listed domain or cluster are assessed.

Number and Quantity

The Real Number System (N-RN)

- ⊙ Extend the properties of exponents to rational exponents (1, 2)
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Quantities □(N-Q)

- + Reason quantitatively and use units to solve problems (2)

The Complex Number System (N-CN)

- ✓ Perform arithmetic operations with complex numbers (1, 2)
- ✓ Solve quadratic equations with real coefficients that have complex solutions (7)

Algebra

Seeing Structure in Expressions (A-SSE)

- ⊙ □ Interpret the structure of expressions (1, 2)
- ⊙ □ Write expressions in equivalent forms to solve problems (3)

Arithmetic with Polynomials and Rational Expressions (A-APR)

- ⊙ □ Perform arithmetic operations on polynomials (1)

Creating Equations □□(A-CED)

- ⊙ □ Create equations that describe numbers or relationships (1, 2, 4)

Reasoning with Equations and Inequalities (A-REI)

- ⊙ □ Understand solving equations as a process of reasoning and explain the reasoning (1)
- ⊙ Solve equations and inequalities in one variable (4)
- ✓ Solve systems of equations (7)

Functions

Interpreting Functions (F-IF)

- ⊙ □ Interpret functions that arise in applications in terms of the context (4, 5, 6)
- + Analyze functions using different representations (7, 8, 9)

Building Functions (F-BF)

- + Build a function that models a relationship between two quantities (1)
- ✓ Build new functions from existing functions (3)

Geometry

Similarity, Right Triangles, and Trigonometry (G-SRT)

- ⊙ □ Understand similarity in terms of similarity transformations (1, 2, 3)
- ⊙ □ Prove theorems using similarity (4, 5)



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- ☑ Define trigonometric ratios and solve problems involving right triangles (6, 7, 8)

Geometric measurement and dimension (G-GMD)

- + Explain volume formulas and use them to solve problems (1, 3)

Statistics

Interpreting categorical and quantitative data (S-ID)

- + Summarize, represent, and interpret data on two categorical and quantitative variables (6)

Conditional Probability and Rules of Probability (S-CP)

- ✓ Understand independence and conditional probability and use them to interpret data (1, 2, 3, 4, 5)
- ✓ Use the rules of probability to compute probabilities of compound events in a uniform probability model (6, 7)

Examples of Key Advances from Mathematics I

- Students extend their previous work with linear and exponential expressions, equations, systems of equations, and inequalities to quadratic relationships.
- A parallel extension occurs from linear and exponential functions to quadratic functions, where students also begin to analyze functions in terms of transformations.
- Building on their work with transformations, students produce increasingly formal arguments about geometric relationships, particularly around notions of similarity.

Discussion of Mathematical Practices in Relation to Course Content

- **Modeling with mathematics** should be a particular focus as students see the purpose and meaning for working with quadratic equations and functions, including **using appropriate tools strategically**.
- As students explore a variety of ways to **represent quadratic expressions**, they should **look for and make use of structure**.
- As their ability to create and use formal mathematical arguments grows, increased emphasis is placed on students' ability to **attend to precision** as well as to **construct viable arguments and critique the reasoning of others**

Fluency Recommendations

Functions: Fluency in graphing functions (including linear, quadratic, and exponential) and interpreting key features of the graphs in terms of their function rules and a table of value, as well as recognizing a relationship (including a relationship within a data set), fits one of those classes. This forms a critical base for seeing the value and purpose of mathematics, as well as for further study in mathematics.

Algebra: Fluency in adding, subtracting, and multiplying polynomials supports students throughout their work in algebra, as well as in their symbolic work with functions. Manipulation can be more mindful when it is fluent.

Geometry: Fluency with the triangle congruence and similarity criteria will help students throughout their investigations of triangles, quadrilaterals, circles, parallelism, and trigonometric ratios. These criteria are necessary tools in geometric modeling.

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