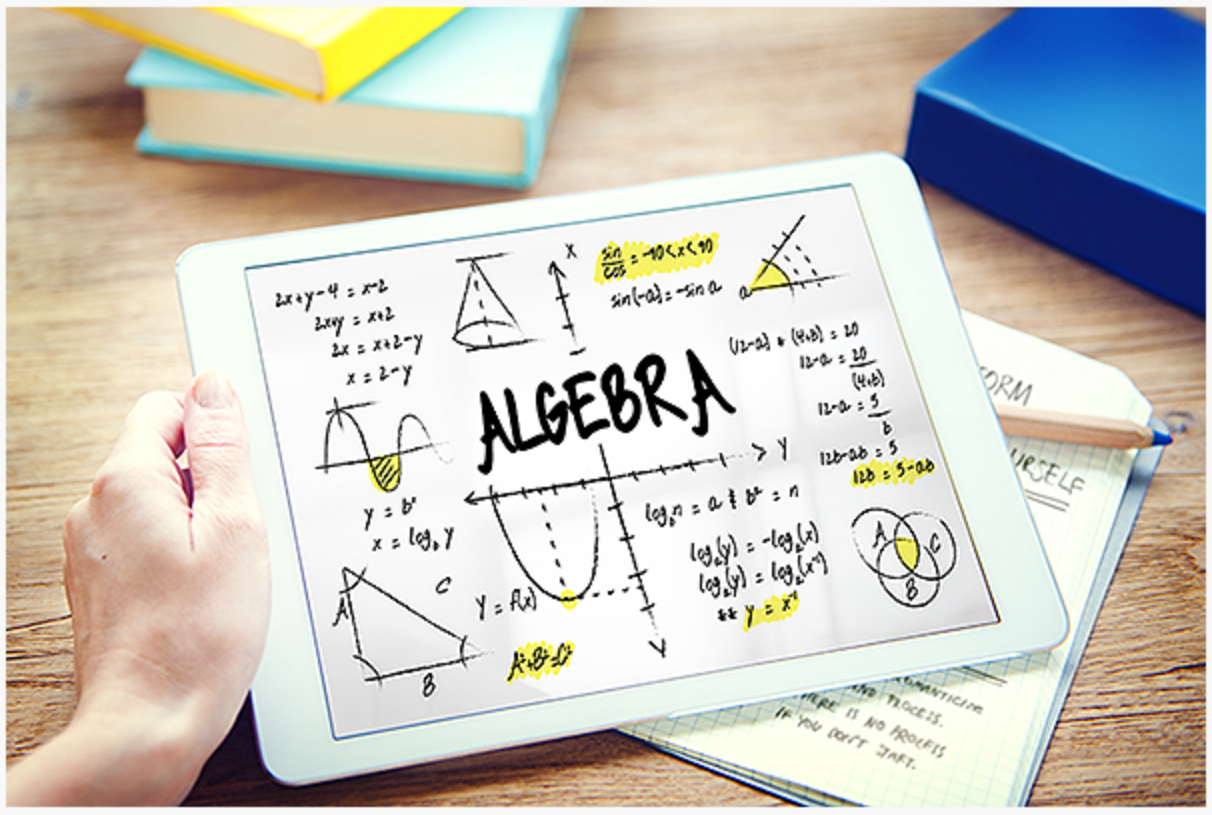
Algebra 2, Part 2



How to Take This Course

Complete all the quizzes and the assignment in each unit. Once the quizzes for a unit are complete, you will have access to the unit test. We recommend you complete the unit assignment before you attempt the unit test, the assignment will help you prepare. You will have access to the final exam when all of the unit tests are complete, and the assignments are completed and graded.

Allow 2-3 days for an assignment to be graded. Read the full course instructions to understand how this course works and is graded.

- Instructions for the Course
- How This Course Works and Suggested Timeline
- Submitting Your Assignments
- Ask The Teacher

Unit 1: Rational Expressions

In this unit we will learn:

- A rational expression is the quotient of two polynomial functions. Simplifying a rational expression, involves factoring the polynomial functions.
- How to identify the values for which the expression is undefined.
- How to perform operations such as addition, subtraction, which require finding a least common denominator, multiplication and division.
- How to apply negative exponents and the relationship between inverses and rational expressions.
- How to solve a rational expression and recognize invalid solutions.
- How to graph rational functions, including finding vertical, slant and horizontal asymptotes.

- 1.1 Simplifying Rational Expressions
  - Quiz 1.1
- 1.2 Adding & Subtracting Rational Expressions
  - Quiz 1.2

- 1.3 Multiplying & Dividing Rational Expressions
  - Quiz 1.3
- 1.4 Positive and Negative Powers
  - Quiz 1.4
- 1.5 Solving Rational Equations
  - Quiz 1.5
- 1.6 Graphing Rational Functions
  - Quiz 1.6
- Unit 1 Assignment: Math on the Street

Unit 2: Exponents, Roots, Radicals

In this unit we will learn:

- How to work with exponents, including both positive and negative power exponents.
- To develop an understanding of the relationship between roots and exponents, and their reciprocal relationship, and how to solve equations with roots and equations with exponents.
- How to manipulate and work with radical equations and to perform operations with radical expressions, including how to add and subtract like radicals.
- How to simplify radicals in fractions, understanding how to rationalize a denominator by multiplying top and bottom by the root in the denominator, or by multiplying the top and bottom by the conjugate of the denominator.
- How to manipulate and simplify complex fractions.

- 2.1 Roots and Exponents
  - Quiz 2.1
- 2.2 Radical Equations and Operations
  - Quiz 2.2
- 2.3 Radicals in Fractions
  - Quiz 2.3
- 2.4 Fractions in the Exponent
  - Quiz 2.4
- 2.5 Complex Fractions
  - Quiz 2.5
- Unit 2 Assignment: Using Radical Equations - Speed Racer

Unit 3: Exponential and Logarithmic Functions

In this unit we will learn:

- How to identify and analyze exponential functions, paying special attentions to the end behavior of graphs based on the key characteristics of the function.
- To understand that a positive exponent leads to an increasing graph while a negative exponent leads to a decreasing graph.
- How to use this understanding of exponential functions to solve exponential equations and how to be aware of domain and range restrictions for exponential equations.
- How to manipulate exponential equations and expressions with the base 10.
- To grasp an understanding of base e expressions and equations, and that base e and the natural log are inverses of one another.

- 3.1 Exponential Functions
  - Quiz 3.1

- 3.2 Exponential Equations
  - Quiz 3.2
- 3.3 Inverse Functions P
  - Quiz 3.3
- 3.4 Properties of Log Functions
  - Quiz 3.4
- 3.5 Base e
  - Quiz 3.5
- 3.6 Logarithmic Equations
  - Quiz 3.6
- 3.7 Translation of Exponential and Logarithmic Graphs
  - Quiz 3.7
- Unit 3 Assignment: Logarithm Puzzles

Unit 4: Conic Sections- Solving, Graphing

In this unit we will learn:

- The equations for and graphs of conicsections, including those for circle, ellipses, hyperbolas, and parabolas.
- How to decipher the center and radius of a circle, given its equations, as well as match graphs of circles to their equations.
- How to put equations for circles into standard form, so they can be analyzed more easily.
- To master ellipses and how to sketch an ellipse from its equations by identifying its center, major and minor axis, and focal points.
- The parts and characteristics of hyperbolas and how to sketch their graphs, given an equation.
- To become proficient in graphing parabolas using key components of their equations, such as their vertex, axis of symmetry, and focus.
- How to distinguish between circles, ellipses, hyperbolas, and parabolas, using only their equations.

- 4.1 Circles: Equations & Graphs of
  - Quiz 4.1
- 4.2 Ellipses: Equations & Graphs of
  - Quiz 4.2
- 4.3 Hyperbolas: Equations & Graphs of
  - Quiz 4.3
- 4.4 Parabolas: Equations & Graphs of
  - Quiz 4.4
- Unit 4 Assignment: Math Art

Unit 5: Trigonometry

In this unit we will learn:

- How to solve for the six trigonometric functions and to determine the sine, Cosine, Tangent, Cosecant, Secant, and Cotangent of given the sketch of a right triangle.
- How to find the remaining trigonometric functions given one of the six trig functions.
- How to convert between radians and degrees and how to solve problems in which a certain angle is expressed in either and is to be converted to the other.
- To gain a mastery of recognizing and working with special triangles, knowing the ratios of the sides of 30-60-90 triangles and 45-45-90 triangles. How to solve for missing sides of special triangles given one side length and two angles.

- 5.1 Sin, Cos, Tan, Cosec, Sec, Cot
  - Quiz 5.1
- 5.2 Converting Between Radians to Degrees
  - Quiz 5.2
- 5.3 Trig Ratios of Special Angles
  - Quiz 5.3
- 5.4 The Unit Circle
  - Quiz 5.4
- 5.5 Inverses of Trigonometry Functions
  - Quiz 5.5
- 5.6 The Law of Sines
  - Quiz 5.6
- 5.7 The Law of Cosines
  - Quiz 5.7
- Unit 5 Assignment: Calculating the Cost of Repair

Unit 6: Permutations & Combinations

In this unit we will learn:

- How to solve real life problems involving permutations and combinations, with scenarios like how many ways a certain number of players can form a roster, or how many ways some friends can be arranged in a photo.
- How to assess whether a combination or a permutation is required to solve a particular problem, and how to perform the appropriate calculation. How to solve random chance probability problems and to solve both “replacement” and “without replacement” problems.
- How to use the binomial theorem to raise polynomials to large powers.

- 6.1 Permutations
  - Quiz 6.1
- 6.2 Combinations
  - Quiz 6.2
- 6.3 Basic Probability
  - Quiz 6.3
- 6.4 Binomial Theorem/Probability
  - Quiz 6.4
- Unit 6 Assignment: Probability - Game of Chance

Unit 7: Data

In this unit you will learn

- how to organize data, manipulate data and compute measures of central tendency such as mean, median and mode.
- how to create visuals for measures of central tendency such as bar graphs, box plots, and histographs
- how to compute standard deviation of large and small data sets
- how to determine if a data set is normal in order to make comparisons
- how to use statistic analysis to compare data sets

- 7.1 Measures of Central Tendency
  - Quiz 7.1
- 7.2 Visuals of Central Tendency
  - Quiz 7.2
- 7.3 Variance and Standard Deviation
  - Quiz 7.3
- 7.4 Normal Distribution
  - Quiz 7.4
- 7.5 Standardizing data
  - Quiz 7.5
- Unit 7 Assignment: In the News

Unit 8: Sequence & Series

In this unit we will learn:

- How to identify and manipulate arithmetic sequence to solve for nth terms within that sequence, up to any value for n.
- How to create a formula for solving for the nth term, given as few as two or three values within the arithmetic sequence.
- How to work to find the sum of n terms of an arithmetic sequence, up to any value for n.
- To master the identification of geometric sequences, how to find the common ratio, and to solve for an nth term.
- How to find the sum of any geometric sequence for up to any value of n.
- How to identify an infinite series and to understand when it is possible to find the sum of a converging infinite series, or how to identify a diverging infinite series, and realize that no sum exists.
- In the case that a sum does exist for an infinite series, how to find that sum.

- 8.1 Arithmetic Sequence (nth Term)
  - Quiz 8.1
- 8.2 Arithmetic Series (Sum Of)
  - Quiz 8.2
- 8.3 Geometric Sequence (nth Term)
  - Quiz 8.3
- 8.4 Geometric Series (Sum Of)
  - Quiz 8.4
- 8.5 Sum of Infinite Series
  - Quiz 8.5
- Unit 8 Assignment: Series - Watch it Go

Final Exam

Once you have completed all of the unit tests and all of your assignments have been graded, the final exam will become visible.

Warning: You have only ONE attempt at the final.

Are you ready to take the final? We highly recommend you take the practice final first and if you are weak in any area, review the relevant course material again. You have unlimited attempts at the practice final, it will help you to prepare.

Good Luck!!

- Practice Final

Certificate of Completion

The "Certificate" and "Request a Course Completion Record" links below are not active, they cannot be accessed until you have completed the final. Upon satisfying this requirement, the links will become active and you can use them.

Before you go, we would appreciate your opinion on the course, please take 1 minute to complete the feedback form. We hope you enjoyed this course!

Course Feedback

Thank you for taking this course! Let us know what you think about it.

Request a Course Completion Record

If you need SVHS to send proof of your course completion directly to your school, complete this form.

If you need a hard copy mailed to your school please make a note of this on the form, use the field 'instructions for SVHS'. Don't forget to provide the mailing address of your school.

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Certificate of Completion

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