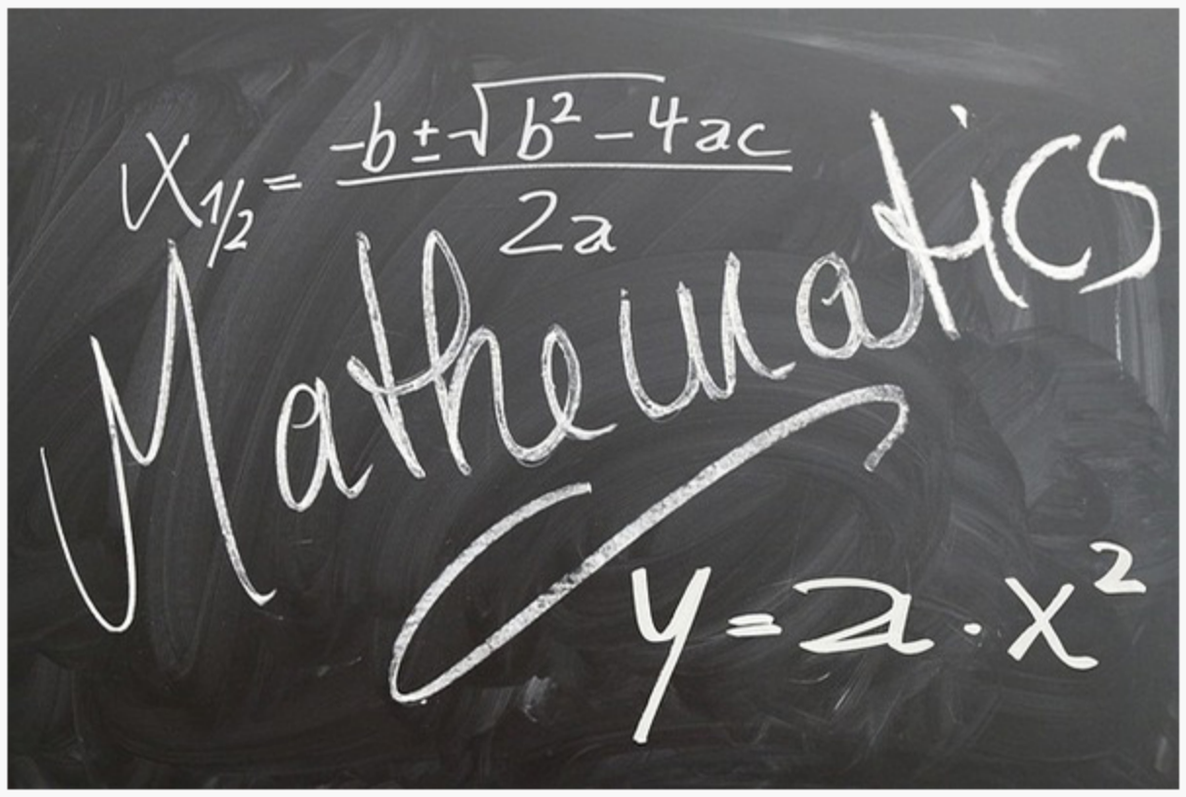
General

Algebra 2, Part 1



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. You will have access to the final exam when all of the unit tests are complete, and the assignments are completed and graded.

Please allow for 2-3 days per assignment for grading. Read the full course instructions so you understand how this course works.

How This Course Works

Instructions for the Course

Ask The Teacher

Meet your teacher for this course and ask a question.

Unit 1 Equations and Inequalities

In this unit we will learn:

- How to write equations from basic mathematical statements.
- How to solve one step and multi-step equations.
- To understand and analyze the differences between equations and inequalities, and how to gain a mastery in solving inequalities as well as graphing them on a number line.
- How to solve absolute value equations and inequalities, understanding that there will be more than one solution in both cases.
- How to graph the absolute value inequalities.

1.1 Writing Equations

Quiz on 1.1 - Writing Equations

1.2 Solving One-Step Equations

Quiz on 1.2 - Solving One-Step Equations

1.3 Solving Multi-Step Equations

Quiz on 1.3 - Solving Multi-Step Equations

1.4 Solving Inequalities

Quiz on 1.4 - Solving Inequalities

1.5 Graphing on Number Lines

Quiz on 1.5 - Graphing on Number Lines

1.6 Solving Absolute Value Equations

Quiz on 1.6 - Solving Absolute Value Equations

1.7 Solving Absolute Value Inequalities

Quiz on 1.7 - Solving Absolute Value Inequalities

Unit 1 Assignment

Unit 2 Linear Functions & Inequalities

In this unit we will learn:

- To understand and show a comprehension of what relations are and what makes a relation a function, with techniques for identifying functions both graphically as well as algebraically.
- How to identify the domain and range for several relations, as well as how to apply domain and range restrictions to real life problems.
- How to graph linear functions and will describe slope behaviors, including how to identify two linear functions that are either parallel or perpendicular.
- How to, given two points, or other key characteristics of a line, be able to work backwards and determine the equation of that line.
- How to solve and graph linear inequalities, showing the understanding that there will be infinite solutions to a linear inequality.

2.1 Relations, Functions, Domain & Range

Quiz on 2.1 - Relations, Functions, Domain & Range

2.2 Graphs of Linear Functions

Quiz on 2.2 - Graphs of Linear Functions

2.3 The Slope of a Line

Quiz on 2.3 - The Slope of a Line

2.4 Parallel and Perpendicular Lines

Quiz on 2.4 - Parallel and Perpendicular Lines

2.5 y = mx + b

Quiz on 2.5 - y = mx + b

2.6 Writing Equations of Lines

Quiz on 2.6 - Writing Equations of Lines

2.7 Graphing Inequalities

Quiz on 2.7 - Graphing Inequalities

Unit 2 Assignment

Unit 3 Systems of Linear Equations and Inequalities

In this unit we will learn:

- How to solve systems of both linear equations and inequalities using a range of potential methods, including the graphing method, the substitution method, and the addition method.
- To understand that each method is favorable under different sets of circumstances, and that all methods should ultimately lead to the exact same solution.
- How to find systems of equations that yield “no solution,” in the case of parallel lines and how to determine if systems are consistent, inconsistent, dependent, or independent.
- How to solve systems of equations with three variables and to understand that in order to solve systems, one must have as many equations as there are variables.

3.1 The Graphing Method -Two Variables

Quiz on 3.1 - The Graphing Method - Two Variables

3.2 The Substitution Method -Two Variables

Quiz on 3.2 - The Substitution Method - Two Variables

3.3 The Addition Method -Two Variables

Quiz on 3.3 - The Addition Method - Two Variables

3.4 Graphing Linear Equations - 3 Variables

Quiz on 3.4 - Graphing Linear Equations - 3 Variables

3.5 Solving Systems of Linear Equations - 3 Variables

Quiz on 3.5 - Solving Systems of Linear equations - 3 Variables

Unit 3 Assignment

Unit 4 Matrices and Determinants

In this unit we will learn:

- How to solve systems of equations using the graphing, addition, and substitution methods, and how to use matrices, as another way to readily solve systems of equations with two and three variables.
- How to perform matrix operations, including addition, subtraction, and in the case of Cramer's rule, division of matrices.
- To understand the limitations upon whether or not certain matrix operations can be performed, based upon the dimensions of the matrices.
- How to find the determinants of both two variable and three variable matrices, and how to use the determinants to find solutions to sets of equations.
- Cramer's rule will be gone into in depth, and students will learn to solve systems using this technique.
- How to find inverses of matrices and how to use the inverses of matrices to solve systems.

4.1 Matrix Operations

Quiz on 4.1 - Matrix Operations

4.2 Multiplication of Matrices

Quiz on 4.2 - Multiplication of Matrices

4.3 Determinants

Quiz on 4.3 - Determinants

4.4 Cramer's Rule

Quiz on 4.4 - Cramer's Rule

4.5 Inverses of 2 x 2 Matrices

Quiz on 4.5 - Inverses of 2x2 Matrices

4.6 Solving Systems Using Matrices

Quiz on 4.6 - Solving Systems using Matrices

Unit 4 Assignment

Unit 5 Quadratic Equations

Complete all of the quizzes in this unit.

- To recognize quadratic equations and to be able to understand and analyze the basic anatomy of a quadratic function, including x and y vertices, axis of symmetry, the vertex, and the direction and relative steepness of the curve of the quadratic.
- To understand that the solution to quadratic equations
- represent the x intercepts and to be able to understand that there can be either one, two, or zero solutions for any given quadratic, which can be shown graphically as well as solved for algebraically.
- How to solve quadratic equations using the factoring method, completing the square, and the quadratic formula and will begin to identify which methods work better for which equations.
- To understand that all three methods should yield the same results.
- To understand the concept of complex roots "i" will be introduced and that in the case of a negative square root, i is used to represent the imaginary solution.
- How to perform basic operations involved i.

5.1 Quadratic Functions: ax^2+bx+c

Quiz on 5.1 - Quadratic Functions

5.2 Solutions to Quadratic Functions; Factoring

Quiz on 5.2 - Solutions to Quadratic Functions - Factoring

5.3 Completing the Square

Quiz on 5.3 - Completing the Square

5.4 The Quadratic Formula

Quiz on 5.4 - Quadratic Formula

5.5 Complex Roots: i

Quiz on 5.5 - Complex Roots: i

Unit 5 Assignment

Unit 6 Graphing Quadratic Functions

In this unit we will learn:

- To perfect the graphing of parabolas, starting with the basic concepts of how the “a” value in the standard form will lead to an upward or downward parabola.
- That different methods of graphing quadratics, the table method, the vertex form, and the intercepts, can be used to demonstrate the different ways to arrive at the same graph.
- How to identify and utilize key points, like the x and y intercepts and the vertex, to be able to quickly sketch any parabola, regardless of what form it is given in.

6.1 Graphing Basic Parabolas (Positive & Negative)

Quiz on 6.1 - Graphing Basic Parabolas

6.2 Graphing Quadratics (Table Method)

Quiz on 6.2 - Graphing Quadratics (Table Method)

6.3 Graphing Quadratics Using Vertex & Intercepts

Quiz on 6.3 - Graphing Quadratics - Vertex and Intercept Method

Unit 6 Assignment

Unit 7 Polynomials

In this unit we will learn:

- The basic vocabulary associated with and the key aspects of polynomials, including the degree of a polynomial and its coefficients.
- How to perform basic operations with polynomials, like the addition, subtraction, multiplication, and division of them. With regards to dividing polynomials, how to factor (when possible) both the top and bottom expressions, and to cancel like factors.
- The two methods of dividing polynomials; long division and synthetic division.
- How to make wise decisions regarding which method would be most convenient and when.
- How to simplify the numerator and denominator of complex fractions, so the final multiplication of the inverse of the denominator can be done.

7.1 Addition and Subtraction of Polynomials

Quiz on 7.1 - Addition and Subtraction of Polynomials

7.2 Products of Polynomials

Quiz on 7.2 - Products of Polynomials

7.3 Factoring Special Polynomials

Quiz on 7.3 - Factoring Special Polynomials

7.4 Division of Polynomials; Long Division

Quiz on 7.4 - Division of Polynomials - Long Division

7.5 Divison of Polynomials: Synthetic Division

Quiz on 7.5 - Division of Polynomials - Synthetic Division

7.6 Complex Fractions

Quiz on 7.6 - Complex Fractions

Unit 7 Assignment

Unit 8 Rational Expressions

In this unit we will learn:

- How to work with rational expressions and how to perform operations with rational expressions.
- To use the basic notion that fractions must have a common denominator to be added or subtracted to go on to add rational expressions.
- How to factor both denominators prior to finding a common denominator, in order to simplify the process. That dividing a fraction by a fraction is the same as multiplying the fraction by the reciprocal of the second fraction.
- That after factoring each expression, students will understand that one can cancel identical factors in order to simplify the expression.
- How to always factor both the numerator and denominator for any rational expression to check for the opportunity to cancel out factors.
- How to check for erroneous solutions by plugging answers back into the original rational expression.

8.1 Simplifying Rational Expressions

Quiz on 8.1 - Simplifying Rational Expressions

8.2 Adding & Subtracting Rational Expressions

Quiz on 8.2 - Adding and Subtracting Rational Expressions

8.3 Multiplying & Dividing Rational Expressions

Quiz on 8.3 - Multiplying and Dividing Rational Expressions

Unit 8 Assignment

The 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. You must score 60% or higher in the final to receive credit for the course!

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 Exam

Course Completion

The "Certificate" and "Transcript Request" links below are not active, they cannot be accessed until you have achieved at least 60% on both the final and for the course total. Upon satisfying these two requirements, 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.

Restricted Not available unless:

- You achieve a required score in **Course total**
- You achieve a required score in **Final Exam**

Certificate of Completion

Restricted Not available unless:

- You achieve a required score in **Final Exam**
- You achieve a required score in **Course total**