

**Course Resources:****Algebra I Concepts - Course Syllabus****Algebra I Concepts - Course Syllabus****Description:**

This course begins with a brief review of what students should already know about linear equations, with a focus on analyzing and explaining the process of solving equations. Students develop a strong foundation in working with linear equations in all forms, extending solution techniques to simple equations with exponents. Students explore functions, including notation, domain and range, multiple representations, and modeling. Through the comparison of linear and exponential functions, students contrast the concepts of additive and multiplicative change. Students then apply what they have learned to linear models of data, analyzing scatterplots and using lines of best fit to apply regression techniques. The course closes with an exploration of rational exponents, quadratic and exponential expressions, and an introduction to non-linear functions, with a heavy emphasis on quadratics.

**Textbook:** Algebra 1 - Excel Education Systems, Inc. ©

**Course objectives:**

Throughout the course, you will meet the following goals:

Analyze and interpret the structure of expressions and write expressions in equivalent forms to solve problems  
 Communicate effectively using graphic, numeric, symbolic, and verbal representations  
 Recognize the graph of given data as being linear, quadratic, or exponential  
 Solve equations and inequalities in one variable and represent and solve equations and inequalities graphically  
 Create and solve equations that describe numbers or relationships  
 Model and solve problems with linear systems graphically

**Semester A**

1: Introduction To Algebra Concepts  
 2: Solving Equations  
 3: Solving Inequalities  
 4: Functions

**Semester B**

5: Linear Functions  
 6: Systems of Equations  
 7: Exponents and Polynomials  
 8: Factoring  
 9: Quadratic Equations  
 10: Probability, Exponentials and Radicals

**Grading Scale**

A = 90-100%  
 B = 80-89%  
 C = 70-79%  
 D = 60-69%  
 F = under 59%

**Grade Weighting**

Quizzes..... 70%  
 Final Exam..... 30%  
 100%

Unit	Benchmarks	Essential Questions	Learning Objectives	Instructional Strategies	Resources	Assessments
Months 1-12						

**Curriculum Map - Mathematics - Algebra I Concepts**

<p>Module 1: Introduction To Algebra Concepts <i>(updated 3/10/21)</i></p>		<ul style="list-style-type: none"> <li>• How are verbal and algebraic models and formulas used to represent real life situations?</li> <li>• How can a problem be translated into an equation?</li> <li>• How is the distributive property used in an algebraic equation or expression?</li> <li>• How do you use the order of operations?</li> <li>• What is function notation?</li> </ul>	<ul style="list-style-type: none"> <li>• The student will represent verbal quantitative situations algebraically and evaluate these expressions for given replacement values of the variables.</li> <li>• The student will translate data to algebraic expressions and equations.</li> <li>• The student will use properties including commutative, associative and distributive laws to rewrite expressions.</li> <li>• The student will recognize and use absolute values.</li> </ul>	<p>direct instruction - textbook direct instruction - interactive video guided practice independent practice</p>	<p>1-1: Introduction to Algebra: Variables 1-2: Absolute Value and Additive Inverses 1-3: Introduction to Reciprocals and Multiplicative Inverses 1-4: Exponents and Powers 1-5 Square Roots and Real Numbers 1-6: Order of Operations 1-7: Simplifying Expressions 1-8: Introduction to Functions</p>	<p>CYU's Section exercise problems Unit 1 Quiz</p>
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Unit	Benchmarks	Essential Questions	Learning Objectives	Instructional Strategies	Resources	Assessments
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Months 1-12

<p>Module 2: Solving Equations <i>(updated 3/11/21)</i></p>		<ul style="list-style-type: none"> <li>• How can we use equations to solve problems?</li> <li>• How can algebraic symbols be manipulated?</li> <li>• How do you solve single variable equations with one, two, or multiple steps?</li> <li>• How can problems be modeled using algebraic symbols?</li> <li>• How do you solve various percent problems?</li> <li>• Where do percentage problems appear outside the classroom?</li> <li>• How do you solve proportions?</li> <li>• How can the result of an equation be checked?</li> <li>• How can rates, ratios, percents, and proportions be applied to problem solving?</li> </ul>	<ul style="list-style-type: none"> <li>• Students will be able to solve equations using the addition, subtraction, multiplication, and division properties of equality.</li> <li>• Students will be able to solve one-step and multi-step algebraic equations.</li> <li>• Students will be able to convert between percentages, decimals, and fractions.</li> <li>• Students will be able to solve percent problems.</li> </ul>	<p>direct instruction - textbook direct instruction - interactive video guided practice independent practice</p>	<p>2-1: Solving Equations by Adding or Subtracting 2-2: Solving Equations by Multiplying or Dividing 2-3: Solving Two-Step and Multi-Step Equations 2.4: Solving Equations with Variables on Both Sides 2-5: Solving for a Variable 2-6: Rates, Ratios and Proportions 2.7 Percents 2.8 Applications of Percents 2.9 Percentage Increases and Decreases</p>	<p>CYU's Section Exercise Problems Unit 2 Quiz</p>
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Unit	Benchmarks	Essential Questions	Learning Objectives	Instructional Strategies	Resources	Assessments
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Months 1-12

**Curriculum Map - Mathematics - Algebra I Concepts**

Module 3: Solving Inequalities <i>(updated 3/10/21)</i>		<ul style="list-style-type: none"> <li>• Why do we want to compare rather than get an exact answer?</li> <li>• How do you solve and graph a linear inequality with one or two variables?</li> <li>• Where do inequalities appear outside the classroom?</li> <li>• How do you solve and graph compound inequalities?</li> </ul>	<ul style="list-style-type: none"> <li>• Students will be able to solve and graph linear inequalities</li> <li>• Students will be able to interpret and solve word problems involving inequalities</li> <li>• Students will be able to solve and interpret compound inequalities.</li> </ul>	direct instruction - textbook direct instruction - interactive video guided practice independent practice	3-1: Graphing and Writing Inequalities 3-2: Solving Inequalities by Adding or Subtracting 3-3: Solving Inequalities by Multiplying or Dividing 3-4 Solving Multi-Step Inequalities 3-5: Solving Inequalities with Variables on Both Sides 3-6: Solving Compound Inequalities	CYU's Section Exercise Problems Unit 3 Quiz
<b>Unit</b>	<b>Benchmarks</b>	<b>Essential Questions</b>	<b>Learning Objectives</b>	<b>Instructional Strategies</b>	<b>Resources</b>	<b>Assessments</b>
Months 1-12						
Module 4: Functions <i>(updated 3/11/21)</i>	<p>MA.9.2.1.1(A) Understand the definition of a function. Use functional notation and evaluate a function at a given point in its domain.</p> <p>MA.9.2.1.2(A) Distinguish between functions and other relations defined symbolically, graphically or in tabular form.</p> <p>MA.9.2.1.3(A) Find the domain of a function defined symbolically, graphically or in a real-world context.</p> <p>MA.9.2.1.4(A) Obtain information and draw conclusions from graphs of functions and other relations.</p>	What are some types of relationships that can be modeled by graphs?	<ul style="list-style-type: none"> <li>• The student will investigate and analyze linear functions and their characteristics both algebraically and graphically, including determining whether a relation is a function; domain and range; zeros of a function; x- and y-intercepts; finding the values of a function for elements in its domain.</li> <li>• The student will write and identify functions from real-world scenarios.</li> </ul>	direct instruction - textbook direct instruction - interactive video guided practice independent practice	4-1: Graphing Functional Relationships 4-2: Relations and Functions 4-3: Writing Functions 4-4: Graphing Functions 4-5: Scatter Plots and Trend Lines 4-6: Arithmetic Sequences	CYU's Section Exercise Problems Unit 4 Quiz
<b>Unit</b>	<b>Benchmarks</b>	<b>Essential Questions</b>	<b>Learning Objectives</b>	<b>Instructional Strategies</b>	<b>Resources</b>	<b>Assessments</b>
Months 1-12						
Module 5: Linear Functions <i>(updated 3/10/21)</i>	<p>MA.9.2.1.6(A) Identify intercepts, zeros, maxima, minima and intervals of increase and decrease from the graph of a function.</p> <p>MA.9.2.1.8(A) Make qualitative statements about the rate of change of a function, based on its graph or table of values.</p> <p>MA.9.2.1.9(A) Determine how translations affect the symbolic and graphical forms of a function. Know how to use graphing technology to examine translations.</p> <p>MA.9.2.2.1(A) Represent and solve problems in various contexts using linear and quadratic functions.</p> <p>MA.9.2.2.3(A) Sketch graphs of linear, quadratic and exponential functions, and translate between graphs, tables and symbolic representations. Know how</p>	<ul style="list-style-type: none"> <li>• What types of relationships can be modeled by linear graphs?</li> <li>• What does the slope of a line mean and how can you find it?</li> <li>• How can you tell what a graph will look like just from looking at its equation?</li> <li>• What are the different forms of linear equations and when do you use them?</li> <li>• What information is needed to write the equation of a line?</li> </ul>	<ul style="list-style-type: none"> <li>• Students will write and graph linear equations in the 2-D coordinate plane.</li> <li>• Students will represent linear patterns with equations and graphs.</li> <li>• Students will calculate slope in several ways.</li> <li>• Students will understand slope-intercept form, standard form (double-intercept form), and point-slope form of linear equations.</li> </ul>	direct instruction - textbook direct instruction - interactive video guided practice independent practice	5-1: Identifying Linear Functions 5-2: Using Intercepts 5-3: Rate of Change and Slope 5-4: The Slope Formula 5-5: Direct Variation 5-6: Slope Intercept Form 5-7: Point-Slope Form 5-8: Slopes of Parallel and Perpendicular Lines 5-9: Transforming Linear Functions	CYU's Section Exercise Problems Unit 5 Quiz

**Curriculum Map - Mathematics - Algebra I Concepts**

Unit	Benchmarks	Essential Questions	Learning Objectives	Instructional Strategies	Resources	Assessments
Months 1-12						
Module 6: Systems of Equations <i>(updated 3/12/21)</i>	MA.9.2.2.1(A) Represent and solve problems in various contexts using linear and quadratic functions. MA.9.2.2.3(A) Sketch graphs of linear, quadratic and exponential functions, and translate between graphs, tables and symbolic representations. Know how to use graphing technology to graph these functions. MA.9.2.4.4(A) Represent relationships in various contexts using systems of linear inequalities; solve them graphically. Indicate which parts of the boundary are included in and excluded from the solution set using solid and dotted lines.	<ul style="list-style-type: none"> <li>• What does it mean if two lines intersect?</li> <li>• What method would be most appropriate to solve the system of equations?</li> <li>• Is the solution to a system of equations reasonable?</li> <li>• Does the system have zero, one, or infinitely many solutions?</li> <li>• How can you recognize parallel or perpendicular lines without graphing them?</li> <li>• How do you solve and graph linear inequalities with one or two variables?</li> <li>• How do you solve a system of inequalities with two variables?</li> </ul>	<ul style="list-style-type: none"> <li>• Students will be able to use different methods to solve systems of linear equations and inequalities.</li> <li>• Students will be able to categorize and determine how many solutions a system of equations has.</li> <li>• Students will be able to graph systems of linear equations and inequalities in 2 variables and identify intercepts and rate of change.</li> </ul>	direct instruction - textbook direct instruction - interactive video guided practice independent practice	6-1: Solving Systems by Graphing 6-2: Solving Systems by Substituting 6-3: Solving Systems by Elimination 6-3: Solving Special Systems 6-5: Solving Linear Inequalities 6-6: Solving Systems of Linear Inequalities	CYU's Section Exercise Problems Unit 6 Quiz
Unit	Benchmarks	Essential Questions	Learning Objectives	Instructional Strategies	Resources	Assessments
Months 1-12						
Module 7: Exponents and Polynomials <i>(updated 3/12/21)</i>	MA.9.2.3.1(A) Evaluate polynomial and rational expressions and expressions containing radicals and absolute values at specified points in their domains. MA.9.2.3.2(A) Add, subtract and multiply polynomials; divide a polynomial by a polynomial of equal or lower degree. MA.9.2.3.3(A) Factor common monomial factors from polynomials, factor quadratic polynomials, and factor the difference of two squares. MA.9.2.3.4(A) Add, subtract, multiply, divide and simplify algebraic fractions. MA.9.2.3.6(A) Apply the properties of positive and negative rational exponents to generate equivalent algebraic expressions, including those involving nth roots. MA.9.2.3.7(A) Justify steps in generating equivalent expressions by identifying the properties used. Use substitution to	<ul style="list-style-type: none"> <li>• How can we better understand the properties of exponents and their applications in problems?</li> <li>• When do we need to use exponential notation to model situations?</li> </ul>	<ul style="list-style-type: none"> <li>• Extend knowledge about exponents to include zero and negative exponents.</li> <li>• Learn Properties of Exponents</li> <li>• Simplify exponential expressions using properties of exponents</li> <li>• Find the degree of a monomial and polynomial</li> <li>• Add, subject, and multiply polynomials</li> <li>• Divide polynomials by monomials</li> </ul>	direct instruction - textbook direct instruction - interactive video guided practice independent practice	7-1: Integer Exponents 7-2: Powers of 10 and Scientific Notation 7-3: Multiplication Properties of Exponents 7-4: Division Properties of Exponents 7-5: Polynomials 7-6: Adding and Subtracting Polynomials 7-7: Multiplying Polynomials, Multiplying Binomials and Foil 7-8 Special Products of Binomials, Difference of Squares	CYU's Section Exercise Problems Unit 7 Quiz

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	check the equality of expressions for some particular values of the variables; recognize that checking with substitution does not guarantee equality of expressions for all values of the variables.					
<b>Unit</b>	<b>Benchmarks</b>	<b>Essential Questions</b>	<b>Learning Objectives</b>	<b>Instructional Strategies</b>	<b>Resources</b>	<b>Assessments</b>
Months 1-12						
Module 8: Factoring  <i>(updated 3/12/21)</i>	<p>MA.9.2.3.3(A) Factor common monomial factors from polynomials, factor quadratic polynomials, and factor the difference of two squares.</p> <p>MA.9.2.4.1(A) Represent relationships in various contexts using quadratic equations and inequalities. Solve quadratic equations and inequalities by appropriate methods including factoring, completing the square, graphing and the quadratic formula. Find non-real complex roots when they exist. Recognize that a particular solution may not be applicable in the original context. Know how to use calculators, graphing utilities or other technology to solve quadratic equations and inequalities.</p>	<ul style="list-style-type: none"> <li>• Why should we factor?</li> <li>• How does the graph of a quadratic function relate to its algebraic equation?</li> </ul>	<ul style="list-style-type: none"> <li>• Factor the GCF from a polynomial.</li> <li>• Factor polynomials by grouping.</li> <li>• Factor trinomials with leading coefficient 1.</li> <li>• Factor trinomials with leading coefficient 1.</li> <li>• Factor perfect square trinomials</li> <li>• Factor difference of two squares.</li> </ul>	direct instruction - textbook direct instruction - interactive video guided practice independent practice	8-1: Factors and Greatest Common Factors 8-2: Factoring by Greatest Common Factor 8-3: Factoring Polynomials with Coefficient of 1 8-4: Factoring Polynomials 8-5: Factoring Special Products 8-6: Choosing a Factoring Method	CYU's Section Exercise Problems Unit 8 Quiz
<b>Unit</b>	<b>Benchmarks</b>	<b>Essential Questions</b>	<b>Learning Objectives</b>	<b>Instructional Strategies</b>	<b>Resources</b>	<b>Assessments</b>
Months 1-12						
Module 9: Quadratic Equations  <i>(updated 3/12/21)</i>	<p>MA.9.2.1.5(A) Identify the vertex, line of symmetry and intercepts of the parabola corresponding to a quadratic function, using symbolic and graphical methods, when the function is expressed in the form <math>f(x) = ax^2 + bx + c</math>, in the form <math>f(x) = a(x - h)^2 + k</math>, or in factored form.</p> <p>MA.9.2.1.6(A) Identify intercepts, zeros, maxima, minima and intervals of increase and decrease from the graph of a function.</p> <p>MA.9.2.2.1(A) Represent and solve problems in various contexts using linear and quadratic functions.</p> <p>MA.9.2.4.1(A) Represent relationships in various contexts using quadratic equations and inequalities. Solve quadratic equations and inequalities by appropriate methods including factoring, completing the square, graphing and the quadratic formula. Find non-real complex roots when they exist. Recognize that a particular solution may not be applicable in the original context. Know how to use calculators, graphing utilities or other technology to solve quadratic equations and</p>	<ul style="list-style-type: none"> <li>• How does the graph of a quadratic function relate to its algebraic equation?</li> <li>• How do the key characteristics of the graph of a quadratic translate to real life problem-solving?</li> </ul>	<ul style="list-style-type: none"> <li>• Students will be able to solve quadratic equations by various techniques such as factoring, finding square roots, completing the square, and applying the quadratic formula.</li> <li>• Students will be able to solve quadratic equations by various methods and using the zero product property.</li> <li>• Students will be able to determine the number of real number solutions using the discriminant.</li> <li>• Students will be able to graph quadratics and identify key characteristics from an equation.</li> <li>• Students will be able to recognize a quadratic relationship from a table of values.</li> </ul>	direct instruction - textbook direct instruction - interactive video guided practice independent practice	9-1: Identifying Quadratic Functions 9-2: Character off Quadratic Functions 9.3 Graphing and Quadratic Functions 9-4: Transforming Quadratic Functions 9-5: Solving Quadratic Equations by Graphing 9-6: Solving Quadratic Equations by Factoring 9-7: Solving Quadratic Equations by Using Square Roots 9-8: Completing the Square 9-9: The Quadratic Formula and the Discriminant	CYU's Section Exercise Problems Unit 9 Quiz

**Curriculum Map - Mathematics - Algebra I Concepts**

Unit	Benchmarks	Essential Questions	Learning Objectives	Instructional Strategies	Resources	Assessments
Months 1-12						
Module 10: Probability, Exponentials and Radicals  <i>(updated 3/16/21)</i>	<p>MA.9.2.2.2(A)                      Represent and solve problems in various contexts using exponential functions, such as investment growth, depreciation and population growth.</p> <p>MA.9.2.2.3(A)                      Sketch graphs of linear, quadratic and exponential functions, and translate between graphs, tables and symbolic representations. Know how to use graphing technology to graph these functions.</p> <p>MA.9.2.2.4(A)                      Express the terms in a geometric sequence recursively and by giving an explicit (closed form) formula, and express the partial sums of a geometric series recursively.</p> <p>MA.9.2.2.5(A)                      Recognize and solve problems that can be modeled using finite geometric sequences and series, such as home mortgage and other compound interest examples. Know how to use spreadsheets and calculators to explore geometric sequences and series in various contexts.</p> <p>MA.9.2.4.2(A)                      Represent relationships in various contexts using equations involving exponential functions; solve these equations graphically or numerically. Know how to use calculators, graphing utilities or other technology to solve these equations.</p> <p>MA.9.2.4.7(A)                      Solve equations that contain radical expressions. Recognize that extraneous solutions may arise when using symbolic methods.</p> <p>MA.9.2.4.8(A)                      Assess the reasonableness of a solution in its given context and compare the solution to appropriate graphical or numerical estimates; interpret a solution in the original context.</p>	<ul style="list-style-type: none"> <li>• Why do we need to use exponential notation to model situations?</li> <li>• How does exponential growth and decay differ from the previous linear and quadratic relationships we've learned and when do they apply?</li> </ul>	<ul style="list-style-type: none"> <li>• Students will be able to calculate with theoretical and experimental probability.</li> <li>• Students will be able to identify and apply ideas exponential growth and exponential decay.</li> <li>• Students will be able to use a calculator to solve exponential growth and decay problems.</li> </ul>	direct instruction - textbook direct instruction - interactive video guided practice independent practice	10-1 Experimental and Theoretical Probability 10-2: Geometric Sequences 10-3: Exponential Growth and Decay 10-4: Radical Expressions 10-5: Operations with Radical Functions	CYU's Section Exercise Problems Unit 10 Quiz