Course Name: Pre AP Algebra 2/Trig

Unit Name: Introduction to Algebra II: The Purpose and Predictability of Patterns

Time Frame:	7 days
Unit Standards	A.1. Skills Acquired by Students a. Identify properties of real numbers an A.1. Skills d use them and the correct order of operations to simplify expressions j. Use inductive reasoning to make conjectures and deductive reasoning to arrive at valid conclusions B.1. Mathematical Processes a. Apply problem-solving skills (e.g., identifying irrelevant or missing information, making conjectures, extracting mathematical meaning, recognizing and performing multiple steps when needed, verifying results in the context of the problem) to the solution of real-world problems b. Use a variety of strategies to set up and solve increasingly complex problems c. Represent data, real-world situations, and solutions in increasingly complex contexts (e.g., expressions, formulas, tables, charts, graphs, relations, functions) and understand the relationships d. Use the language of mathematics to communicate increasingly complex ideas orally and in writing, using symbols and notations correctly e. Make appropriate use of estimation and mental mathematics in computations and to determine the reasonableness of solutions to increasingly complex problems f. Make mathematical connections among concepts, across disciplines, and in everyday experiences g. Demonstrate the appropriate role of technology (e.g., calculators, software programs) in mathematics (e.g., organize data, develop concepts, explore relationships, decrease time spent on computations after a skill has been established) B.1. Mathematical Processes h. Apply previously learned algebraic and geometric concepts to more advanced problems H.2. Sequences and Series a. Find the nth term of an arithmetic or geometric sequence b. Find the position of a given term of an arithmetic or geometric sequence c. Find sums of a finite arithmetic or geometric series d. Use sequences and series to solve real-world problems e. Use sigma notation to express sums
Unit Essential Questions	How can you represent the terms of a sequence explicitly? How can you represent them recursively? What are equivalent explicit and recursive definitions for an arithmetic sequence? How can you model a geometric sequence? How can you model its sum?
Unit Essential Vocabulary	1. arithmetic sequence 2. arithmetic series 3. common difference 4. common ratio 5. explicit formula 6. geometric series 7. geometric sequence 8. recusive formula
Resources	Textbook Kutasoftware Exam view software
Assessment(s)	Unit Test, Quiz, Warm ups, 3-2-1
Assessment Data:	7 days

Course Name: Pre AP Algebra 2/Trig

Unit Name: Linear Equations and Inequalities

Time Frame:	7 days
Unit Standards	B.1. Mathematical Processes a. Apply problem-solving skills (e.g., identifying irrelevant or missing information, making conjectures, extracting mathematical meaning, recognizing and performing multiple steps when needed, verifying results in the context of the problem) to the solution of real-world problems b. Use a variety of strategies to set up and solve increasingly complex problems c. Represent data, real-world situations, and solutions in increasingly complex contexts (e.g., expressions, formulas, tables, charts, graphs, relations, functions) and understand the relationships d. Use the language of mathematics to communicate increasingly complex ideas orally and in writing, using symbols and notations correctly e. Make appropriate use of estimation and mental mathematics in computations and to determine the reasonableness of solutions to increasingly complex problems f. Make mathematical connections among concepts, across disciplines, and in everyday experiences g. Demonstrate the appropriate role of technology (e.g., calculators, software programs) in mathematics (e.g., organize data, develop concepts, explore relationships, decrease time spent on computations after a skill has been established) h. Apply previously learned algebraic and geometric concepts to more advanced problems D.1. Expressions, Equations, and Inequalities a. Solve linear inequalities containing absolute value b. Solve compound inequalities containing "and" and "or" and graph the solution set c. Solve algebraically a system containing three variables D.2. Graphs, Relations, and Functions a. Graph a system of linear inequalities in two variables with and without technology to find the solution set to the system b. Solve linear programming problems by finding maximum and minimum values of a function over a region defined by linear inequalities
Unit Essential Questions	How do you solve an equation or inequality? How do you solve a system ? How does representing functions graphically help you solve a system of inequalities?
Unit Essential Vocabulary	1. absolute value 2. compound inequality 3. term 4. variable 5. Dependent system 6. Independent system
Resources	Textbook Kuta Software Exam View Software
Assessment(s)	Unit Test, Quiz, Warm ups, 3-2-1

Course Name: Pre AP Algebra 2/Trig

Unit Name: Matrices

Time Frame:	10 days
Unit Standards	B.1.MATHEMATICAL PROCESSES a. Apply problem-solving skills (e.g., identifying irrelevant or missing information, making conjectures, extracting mathematical meaning, recognizing and performing multiple steps when needed, verifying results in the context of the problem) to the solution of real-world problems b. Use a variety of strategies to set up and solve increasingly complex problems c. Represent data, real-world situations, and solutions in increasingly complex contexts (e.g., expressions, formulas, tables, charts, graphs, relations, functions) and understand the relationships d. Use the language of mathematics to communicate increasingly complex ideas orally and in writing, using symbols and notations correctly e. Make appropriate use of estimation and mental mathematics in computations and to determine the reasonableness of solutions to increasingly complex problems f. Make mathematical connections among concepts, across disciplines, and in everyday experiences g. Demonstrate the appropriate role of technology (e.g., calculators, software programs) in mathematics (e.g., organize data, develop concepts, explore relationships, decrease time spent on computations after a skill has been established) h. Apply previously learned algebraic and geometric concepts to more advanced problems D.1. Expressions, Equations, and, Inequalities c. Solve algebraically a system containing three variables I.1. Matrices a. Add, subtract, and multiply matrices b. Use addition, subtraction, and multiplication of matrices to solve real-world problems c. Calculate the determinant of 2 × 2 and 3 × 3 matrices d. Find the inverse of a 2 × 2 matrix e. Solve systems of equations by using inverses of matrices and determinants f. Use technology to perform operations on matrices, find determinants, and find inverses
Unit Essential Questions	How can you add, subtract, and multiply arrays of numbers? How can you use a matrix to represent and solve a system of equations?
Unit Essential Vocabulary	1. ELEMENTS 2. MATRIX EQUATION 3. ZERO MATRIX 4. EQUAL MATRICES 5. SQUARE MATRIX 6. INVERSE OF MATRICES 7. DETERMINANT OF MATRIX 8. COEFFICENT MATRIX 9. VARIABLE MATRIX 10. CONSTANT MATRIX
Resources	Text book, Kuta Software Exam View Software
Assessment(s)	Unit Test, Quiz, Warm ups, 3-2-1

Course Name:	Pre AP Algebra 2/Trig
Unit Name:	Functions, Relations, and Conics
Time Frame:	7 days
Unit Standards	B.1. Mathematical Processes a. Apply problem-solving skills (e.g., identifying irrelevant or missing information, making conjectures, extracting mathematical meaning, recognizing and performing multiple steps when needed, verifying results in the context of the problem) to the solution of real-world problems b. Use a variety of strategies to set up and solve increasingly complex problems c. Represent data, real-world situations, and solutions in increasingly complex contexts (e.g., expressions, formulas, tables, charts, graphs, relations, functions) and understand the relationships d. Use the language of mathematics to communicate increasingly complex ideas orally and in writing, using symbols and notations correctly e. Make appropriate use of estimation and mental mathematics in computations and to determine the reasonableness of solutions to increasingly complex problems f. Make mathematical connections among concepts, across disciplines, and in everyday experiences g. Demonstrate the appropriate role of technology (e.g., calculators, software programs) in mathematics (e.g., organize data, develop concepts, explore relationships, decrease time spent on computations after a skill has been established) h. Apply previously learned algebraic and geometric concepts to more advanced problems C.1. Foundations a. Identify complex numbers and write their conjugates b. Add, subtract, and multiply complex numbers c. Simplify quotients of complex numbers d. Perform operations on functions, including function composition, and determine domain and range for each of the given functions E.2. Graphs, Relations, and Functions a. Determine the domain and range of a quadratic function; b. Use transformations (e.g., translation, reflection) to draw the graph of a relation and determine a relation that fits a graph E.3. Conic Sections a. Identify conic sections (e.g., parabola, circle, ellipse, hyperbola) from their equations in standard form b. Graph circles and parabolas and their translations from given equations or characteristics with and without technology c. Determine characteristics of circles and parabolas from their equations and graphs d. Identify and write equations for circles and parabolas from given characteristics and graphs
Unit Essential Questions	How do you add, subtract, multiply and find composite functions? What is the domain and range of a quadratic function? What are the advantages of a quadratic function in vertex form? In standard form? How is any quadratic function related to the parent quadratic function $y = x^2$? How are the real solutions of a quadratic equation related to the graph of the related quadratic function? What is the difference between the algebraic representations of conics?
Unit Essential Vocabulary	1. Domain 2. Range 3. Composite Functions 4. Quadratic Functions and Equations 5. Axis of Symmetry 6. Parabola 7. Vertex Form 8. Circle 9. Radius 10. Directrix 11. Focus
Resources	Textbook, Kuta Software Exam View Software
Assessment(s)	Unit Test, Quiz, Warm ups, 3-2-1

Course Name: Pre AP Algebra 2/Trig

Unit Name:	Quadratic Functions, Inequalities, Functions
Time Frame:	7 days
Unit Standards	B.1. Mathematical Processes a. Apply problem-solving skills (e.g., identifying irrelevant or missing information, making conjectures, extracting mathematical meaning, recognizing and performing multiple steps when needed, verifying results in the context of the problem) to the solution of real-world problems b. Use a variety of strategies to set up and solve increasingly complex problems c. Represent data, real-world situations, and solutions in increasingly complex contexts (e.g., expressions, formulas, tables, charts, graphs, relations, functions) and understand the relationships d. Use the language of mathematics to communicate increasingly complex ideas orally and in writing, using symbols and notations correctly e. Make appropriate use of estimation and mental mathematics in computations and to determine the reasonableness of solutions to increasingly complex problems f. Make mathematical connections among concepts, across disciplines, and in everyday experiences g. Demonstrate the appropriate role of technology (e.g.,calculators, software programs) in mathematics (e.g., organize data, develop concepts, explore relationships , decrease time spent on computations after a skill has been established) h. Apply previously learned algebraic and geometric concepts to more advanced problem C.1. Foundations a. Identify complex numbers and write their conjugates b. Add, subtract, and multiply complex numbers c. Simplify quotients of complex numbers E.1. Equations and Inequalities a. Solve quadratic equations and inequalities using various techniques, including completing the square and using the quadratic formula b. Use the discriminant to determine the number and type of roots for a given quadratic equation c. Solve quadratic equations with complex number solutions d. Solve quadratic systems graphically and algebraically with and without technology E.2. Graphs, Relations, and Functions b. Use transformations (e.g., translation, reflection) to draw the graph of a relation and determine a relation that fits a graph c. Graph a system of quadratic inequalities with and without technology to find the solution set to the system
Unit Essential Questions	1. How do you perform operations on complex numbers? 2. How is the process of completing the square used to solve quadratic equations? 3. How do you use the quadratic formula and the discriminant? 4. How can you tell if a quadratic equation has one or two solutions? 5. How do you solve systems of quadratic inequalities?
Unit Essential Vocabulary	1.Complex numbers 2.Complex conjugates 3. Discriminant 4. Imaginary number 5. Completing the square 6. Quadratic formula
Resources	Textbook, Kuta Software Exam View Software
Assessment(s)	Unit Test, Quiz, Warm ups, 3-2-1

Course Name: Pre AP Algebra 2/Trig

Unit Name:	Exploring Polynomial Expressions, Equations, and Functions
Time Frame:	7 days
Unit Standards	F. Exploring Polynomial Expressions, Equations, and Functions 1. Expressions and Equations a. Evaluate and simplify polynomial expressions and equations b. Factor polynomials using a variety of methods (e.g., factor theorem, synthetic division, long division, sums and differences of cubes, grouping
Unit Essential Questions	1. What are the special product patterns? 2. How can you solve a higher-degree polynomial equation? 3. When you factor a quadratic how can you check to see that you have the correct answer? 4. What should always be your first step when you are asked to factor a polynomial?
Unit Essential Vocabulary	1. Like Terms 2. Factored completely 3. Factor by grouping 4. Sum and differences of cubes
Resources	Textbook Kuta Software Exam View Software
Assessment(s)	Unit Test, Quiz, Warm ups, 3-2-1

Course Name: Pre AP Algebra 2/Trig

Unit Name: Functions

Time Frame:	7 days
Unit Standards	F. Exploring Polynomial Expressions, Equations, and Functions 1. Expressions and Equations a. Evaluate and simplify polynomial expressions and equations b. Factor polynomials using a variety of methods (e.g., factor theorem, synthetic division, long division, sums and differences of cubes, grouping) 2. Functions a. Determine the number and type of rational zeros for a polynomial function b. Find all rational zeros of a polynomial function c. Recognize the connection among zeros of a polynomial function, x-intercepts, factors of polynomials, and solutions of polynomial equations d. Use technology to graph a polynomial function and approximate the zeros, minimum, and maximum; determine domain and range of the polynomial function
Unit Essential Questions	How can you solve a higher degree polynomial function? If you know one of the zeros how can you determine the others? How can you find all real zeros when the leading coefficient is 1? How can you determine the possible number of positive, negative, and imaginary zeros of a polynomial function? When does a graph have a local maximum or local minimum?
Unit Essential Vocabulary	1 .Zero 2. Solution 3. Intercept 4. Polynomial long division 5. Synthetic Division 6.Constant term 7.Leading coefficient 8. Rational Zeros 9. Irrational conjugates 10.Complex conjugates 11. Descartes' Rule of signs 12. Local minimum 13. Local maximum
Resources	Textbook Kuta Software Exam View Software
Assessment(s)	Unit Test, Quiz, Warm ups, 3-2-1

Course Name:	Pre AP Algebra2/Trig
Unit Name:	Exponential and Logarithm Functions
Time Frame:	7 days
Unit Standards	G. Exploring Advanced Functions 2. Exponential and Logarithmic Functions a. Graph exponential and logarithmic functions with and without technology b. Convert exponential equations to logarithmic form and logarithmic equations to exponential form
Unit Essential Questions	How do we evaluate, analyze, and graph exponential and logarithmic functions? How can we apply the properties of logarithms? How do we solve exponential and logarithmic equations? What is the relationship between exponential and logarithm functions? How can you use a calculator to evaluate a logarithm when the base is not 10 or e? Why do logarithmic equations sometimes have extraneous solutions?
Unit Essential Vocabulary	1. exponential function 9. Extraneous solution 2. natural base 10. Exponential equation 3. logarithm 4. natural logarithm 5. asymptote 6.common logarithm 7.base 8.logarithm equation
Resources	Textbook Kuta Software Exam View Software
Assessment(s)	Unit Test, Quiz, Warm ups, 3-2-1

Course Name: Pre AP Algebra 2/Trig

Unit Name: Trigonometry

Time Frame:	10 days
Unit Standards	3. Trigonometric and Periodic Functions a. Use the law of cosines and the law of sines \ to find the lengths of sides and measures of angles of triangles in mathematical and real-world problems b. Use the unit-circle definition of the trigonometric functions and trigonometric relationships to find trigonometric values for general angles c. Measure angles in standard position using degree or radian measure and convert a measure from one unit to the other d. Graph the sine and cosine functions with and without technology e. Determine the domain and range of the sine and cosine functions, given a graph f. Find the period and amplitude of the sine and cosine functions, given a graph g. Use sine, cosine, and tangent functions, including their domains and ranges, periodic nature, and graphs, to interpret and analyze relations
Unit Essential Questions	How do you graph sine and cosine functions? What is the amplitude and period? What is the domain and range? What is the maximum and minimum? How do we solve right triangles and any triangle? How do we change from degrees to radians and radians to degrees? How do we use the unit circle? How do we find the area of any triangle?
Unit Essential Vocabulary	Radian Degree Unit circle Law of Sines Law of Cosines Area of Triangle Amplitude Period Domain Range Maximum Value Minimum Value
Resources	Textbook Kuta Software Exam View Software
Assessment(s)	Quiz, Unit test, Warm ups, 1-2-3

Course Name: Pre AP Algebra 2/Trig

Unit Name: Exploring Advanced Functions

Time Frame:	7 days
Unit Standards	G. Exploring Advanced Functions 1. Rational and Radical Expressions, Equations, and Functions a. Solve mathematical and real-world rational equation problems (e.g., work or rate problems) b. Simplify radicals that have various indices c. Use properties of roots and rational exponents to evaluate and simplify expressions d. Add, subtract, multiply, and divide expressions containing radicals e. Rationalize denominators containing radicals and find the simplest common denominator f. Evaluate expressions and solve equations containing in the roots or rational exponents g. Evaluate and solve radical equations given a formula for a real-world situation
Unit Essential Questions	How do you simplify radicals that have various indices? How do you add, subtract, multiply, and divide expressions containing radicals? How do you rationalize denominators? How do you solve equations with radicals?
Unit Essential Vocabulary	1. Indices 2. nth root of a radical 3. radical 4. conjugate
Resources	Textbook Kuta Software Exam View Software
Assessment(s)	Warm ups, 3-2-1, Unit test, quiz

Course Name:	Pre AP Algebra 2/ Trig
Unit Name:	Organizing and Analyzing Data and Applying Probability
Time Frame:	7 days
Unit Standards	H. Organizing and Analyzing Data and Applying Probability 1. Data Relations, Probability, and Statistics a. Use the fundamental counting principle to count the number of ways an event can happen b. Use counting techniques, like combinations and permutations, to solve problems (e.g., to calculate probabilities) c. Find the probability of mutually exclusive and non-mutually exclusive events d. Find the probability of independent and dependent events e. Use unions, intersections, and complements to find probabilities f. Solve problems involving conditional probability
Unit Essential Questions	What is the difference between a permutation and a combination? What is the difference between mutually exclusive and non-mutually exclusive events? What is the difference between independent and dependent events? How do you find conditional probability?
Unit Essential Vocabulary	1. Fundamental Counting Principle 2. Combinations 3. Permutations 4. Mutually Exclusive Events 5. Non Mutually Exclusive Events 6. Independent Events 7. Dependent Event 8. Probability 9. Union 10. Intersection 11. Complements
Resources	Textbook Kuta Software Exam View Software
Assessment(s)	Warm up, Unit test, quiz, 3-2-1