Unit	Lesson	Lesson Objectives
The Nature of Functions and Complex Numbers		
	Function Operations	
		Combine functions using arithmetic operations, expressing the results both algebraically and graphically.
		Evaluate sums, differences, products, and quotients of functions.
	Composition of Functions	
		Evaluate the composition of functions.
		Find the domain of the composition of functions.
		Write an expression for the composition of functions.
	Symmetry	
		Determine the symmetry of a function algebraically.
		Determine the symmetry of a relation from a graph.
	Function Inverses	
		Find the inverse of a function.
		Use composition to verify that functions are inverses.
	Complex Numbers	
		Determine the absolute value of a complex number.
		Represent complex numbers in the form $a + bi$ or in the complex plane.
		Represent square roots of negative numbers as multiples of i.
		Simplify powers of i using their cyclic nature.
	Performing Operations with Complex Numbers	
		Identify the field properties of complex numbers.
		Perform addition, subtraction, multiplication, and division of complex numbers.
	Distance and Midpoints in the Complex Plane	
		Calculate the modulus of a complex number.
		Solve problems involving distances and midpoints in the complex plane.
		Use the average to find the midpoint of a segment in the complex plane.
		Use the modulus to find the distance between any two complex numbers in the plane.
	Completing The Square	
		Find complex solutions to quadratic equations by completing the square.
		Recognize the pattern of a perfect-square trinomial as the square of a binomial.
		Use the square root property to solve equations.
	The Quadratic Formula	
		Find real and complex solutions of quadratic equations using the quadratic formula.
		Use the discriminant to determine the number and type of roots of a quadratic equation.

Unit	Lesson	Lesson Objectives
Matrices		
	Introduction to Matrices	
		Determine if two matrices are equal.
		Identify types of matrices.
		Represent and interpret data in matrices.
	Adding and Subtracting Matrices	
		Apply matrix addition to model problems and solve matrix equations.
		Identify and apply the properties of matrix addition.
		Perform matrix addition and subtraction.
	Scalar and Matrix Multiplication	
		Perform multiplication of a scalar and a matrix.
		Perform multiplication of two matrices.
	Determinants	
		Apply determinants to solve problems.
		Evaluate determinants of 2×2 and 3×3 matrices.
	Matrices and Their Inverses	
		Find the inverse of a matrix.
	Solving Matrix Equations	
		Solve matrix equations by taking the inverse of a matrix.
		Solve matrix equations using operations with matrices.
	Matrices and Row Operations	
		Perform row operations in matrices.
		Solve a linear system using reduced row echelon form.
	Modeling with Matrices	
		Model and solve real-world problems using matrices.
	Modeling Motion with Matrices	
		Use Matrices to determine the coordinates of polygons under a given transformation.
Systems of Equations		
	Solving Equations Graphically	
		Solve equations using the intersect method.
		Solve equations using the x-intercept method.
	Solving 3×3 Linear Systems	
		Classify systems of three-variable equations as dependent, independent, consistent, or inconsistent.
		Solve 3×3 linear systems algebraically.
	Modeling with Linear Systems	
		Model and solve real-world problems using systems of linear equations and inequalities.

Unit	Lesson	Lesson Objectives
	Linear Programming	
		Maximize a function given constraints.
		Represent and solve real-world problems using linear programming.
	Mixed Degree Systems	
		Determine the reasonableness of solutions to systems of a linear equation and a quadratic equation in two variables.
		Solve linear-quadratic systems of equations.
		Solve quadratic-quadratic systems of equations.
	Modeling with Systems	
		Model and solve real-world problems using linear-quadratic or quadratic-quadratic systems of equations.
Functions and Their Graphs		
	Monomial Functions	
		Analyze the key attributes of monomial functions.
	Graphs of Polynomial Functions	
		Describe the key features of a polynomial function.
		Identify the key features of a polynomial function from a given graph.
	Graphing Radical Functions	
		Determine the domain and range of square root and cube root functions.
		Relate transformations to the graphs of square root and cube root functions to their parent function.
	Graphing Exponential Functions	
		Determine the domain and range of exponential functions.
		Graph exponential functions.
		Identify exponential functions.
	Graphing Logarithmic Functions	
		Determine the domain and range of logarithmic functions.
		Identify and analyze the graphs of logarithmic functions.
		Identify logarithmic functions.
	Absolute Value Functions	
		Analyze absolute value functions to determine key features of the graph.
		Model and solve mathematical and real-world problems with absolute value functions.
	Piecewise Defined Functions	
		Determine the domain, range, and continuity of piecewise defined functions.
		Evaluate piecewise defined functions.
		Graph piecewise defined functions.

Unit	Lesson	Lesson Objectives
	Step Functions	
		Analyze step functions to determine key features of the graph.
		Evaluate step functions.
		Use step functions to model real-world problems.
	Performance Task: Production Schemes	
		Determine the reasonableness of a function model.
		Use an appropriate function model to describe random data.
		Use function models to make predictions about situations.
Rational Functions		
	Vertical Asymptotes of Rational Functions	
		Determine the vertical asymptotes and holes in the graph of a rational function having the *x* -axis as its only horizontal asymptote.
		Solve problems involving inverse variation.
	Graphing Rational Functions	
		Determine the horizontal asymptotes of a rational function.
		Graph rational functions that have only vertical or horizontal asymptotes.
	Rational Inequalities	
		Solve rational inequalities algebraically and determine extraneous solutions.
	Modeling with Rational Functions	
		Model and solve real-world problems using rational functions.
	Graphs of Rational Functions	
		Analyze key features of a rational function.
		Graph a rational function.
		Use algebraic techniques to determine key features of a rational function.
	Rational Equations and Partial Fractions	
		Decompose a fraction into partial fractions.
		Solve rational equations and inequalities.
Right Triangle and Circular Trigonometry		
	Right Triangle Trigonometry	
		Use special right triangle relationships to solve right triangles.
		Use the Pythagorean theorem, and the trigonometric functions and their inverses to solve right triangles.
	Solving for Side Lengths of Right Triangles	
		Apply trigonometric ratios to solve real-world problems.
		Solve for unknown side lengths of right triangles using trigonometric ratios.
		Write equations using trigonometric ratios that can be used to solve for unknown side lengths of right triangles.

Unit	Lesson	Lesson Objectives
	Solving for Angle Measures of Right Triangles	
		Apply inverse trigonometric functions to solve real-world problems.
		Solve for unknown angles of right triangles using inverse trigonometric functions.
		Write equations that can be used to solve for unknown angles in right triangles.
	Angles in Standard Position	
		Determine angles that are coterminal.
		Identify characteristics of angles in standard position.
	Radian Measure	
		Convert between degree and radian measure.
		Use the definition of radian measure to calculate arc lengths, radii, and angle measures.
	The Unit Circle	
		Compare sine, cosine, and tangent values for angles having the same reference angle.
		Find the sine, cosine, and tangent values of angle measures using the unit circle.
	Reciprocal Trigonometric Functions	
		Evaluate the six trigonometric functions for special angles.
		Simplify expressions involving the six trigonometric functions using reciprocal relationships.
		Solve right triangle trigonometry problems involving reciprocal trigonometric functions.
Graphing Trigonometric Functions		
	Graphing Sine and Cosine	
		Analyze key features of sine and cosine functions from equations and graphs.
	Changes in Period and Phase Shift of Sine and Cosine Functions	
		Relate transformations of the graphs of the sine and cosine functions to the equation.
	Graphing Cosecant and Secant Functions	
		Analyze key features of secant and cosecant functions from equations and graphs.
	Graphing Tangent and Cotangent	
		Analyze key features of tangent and cotangent functions from equations and graphs.
	Trigonometric Inverses and Their Graphs	
		Find principal values of inverse trigonometric functions.
		Graph inverse trigonometric functions.
	Modeling with Periodic Functions	
		Model and solve real-world problems using periodic functions.
Trigonometry		
	Evaluating the Six Trigonometric Functions	
		Evaluate the six trigonometric functions for angles in degrees or radians based on one or more given trigonometric function values.
		Evaluate the six trigonometric functions for angles in degrees or radians given a point on the terminal ray.

Unit	Lesson	Lesson Objectives
	Basic Trigonometric Identities	
		Identify and use reciprocal identities, quotient identities, Pythagorean identities, symmetry identities, and opposite-angle identities.
	Verifying Trigonometric Identities	
		Find numerical values of trigonometric functions.
		Use the basic trigonometric identities to verify other identities.
	Sum and Difference Identities	
		Use the sum and difference identities for the sine, cosine, and tangent functions.
	Double-Angle and Half-Angle Identities	
		Use the double- and half-angle identities for the sine, cosine, and tangent functions.
	Solving Trigonometric Equations	
		Analyze key features of inverse trigonometric functions from equations and graphs.
		Evaluate inverse trigonometric functions over a specified domain.
		Solve trigonometric equations over a specified domain.
	Law of Sines	
		Apply the law of sines to solve mathematical and real-world problems.
		Determine whether a triangle has zero, one, or two solutions using the ambiguous case of the law of sines.
	Law of Cosines	
		Apply the law of cosines to solve mathematical and real-world problems.
	Law of Sines and Law of Cosines — a Deeper Look	
		Use right triangle trigonometry to develop and prove the Law of Cosines.
		Use right triangle trigonometry to develop and prove the Law of Sines.
		Use the Law of Cosines to solve problems.
		Use the Law of Sines to solve problems.
Vectors		
	Geometric Vectors	
		Add and subtract vectors geometrically.
		Find equal, opposite, and parallel vectors.
	Algebraic Vectors	
		Add, subtract, multiply, and find the magnitude of vectors algebraically.
		Find ordered pairs that represent vectors.
	Vector Multiplication Using Matrices	
		Multiply a vector (regarded as a matrix with one column) by a matrix of suitable dimensions to produce another vector.
		Solve problems involving transformations of vectors using matrices.
	Dot Products of Vectors	
		Calculate dot products and projections of vectors.

Unit	Lesson	Lesson Objectives
	Vectors in Three-Dimensional Space	
		Add and subtract vectors in three-dimensional space.
		Find the magnitude of vectors in three-dimensional space.
	Perpendicular Vectors	
		Determine whether two vectors are perpendicular.
		Find the inner and cross products of two vectors.
	Vectors and Parametric Equations	
		Graph parametric equations.
		Write vector and parametric equations of lines.
	Polar Coordinates	
		Convert points and equations from polar to rectangular coordinates and vice versa.
	Graphs of Polar Equations	
		Graph polar equations and determine the maximum r-value and the symmetry of a graph.
	De Moivre's Theorem and nth Roots	
		Represent complex numbers in trigonometric form and perform operations on them.
Conics and Analytic Geometry		
	Conic Sections: Parabolas	
		Solve applied problems involving parabolas.
		Use and determine the standard form of the equation of the parabola.
	Equations of Ellipses	
		Identify the center, foci, directrix, and vertices of an ellipse from an equation or graph.
		Write the equation of an ellipse from a given graph or information about its center, foci, directrix, or vertices.
	Equations of Hyperbolas	
		Determine the foci, directrices, vertices, and asymptotes of a hyperbola with center at the origin from an equation or graph.
		Graph a hyperbola with center at the origin from a given equation.
		Write the equation of a hyperbola with center at the origin from a given graph or information about its foci, directrices, or vertices.
	Classifications and Rotations of Conics	
		Apply translated conics to real-world problems.
		Determine the shape of a translated conic without graphing.
		Graph a translated conic.
		Write the equation of a translated conic.
	Polar Equations of Conics	
		Understand the general focus-directrix definition of a conic section and will be able to write equations of conic sections in polar form.

Unit	Lesson	Lesson Objectives
Statistics and Probability		
	Properties of Probability Distributions	
		Create probability distributions from a data set.
		Identify properties of a probability distribution.
		Solve problems using probability distributions.
	Expected Value	
		Calculate expected values.
		Use expected values to make decisions.
	Binomial Distribution	
		Calculate binomial probabilities.
		Identify a binomial experiment.
		Identify the probability of success, probability of failure, and number of trials for a binomial experiment.
	Introduction to Normal Distributions	
		Apply the z-score formula to solve problems.
		Describe normal distributions using the mean and standard deviation.
		Solve problems using the empirical rule.
	Applications with Standard Normal Distribution	
		Solve problems using the standard normal table.
	Statistical Inferences	
		Make inferences about a population from a sample.
Mathematical Modeling		
	Domain and Range	
		Determine the domain and range of a function in both mathematical and real-world contexts.
	Transformations of Functions	
		Analyze a function rule or graph to determine transformations of the parent function.
		Identify a function as belonging to a family of functions.
	Analyzing Compositions of Functions	
		Determine the domain and range of the composition of functions.
		Find compositions of functions from a variety of function families.
	Modeling with Functions	
		Find the equation of a function that best models a data set.
		Use function models to solve problems.

Unit	Lesson	Lesson Objectives
Sequences and Series		
	Arithmetic Sequences	
		Apply the formula of an arithmetic sequence.
		Determine if a sequence is arithmetic.
		Find the common difference of an arithmetic sequence.
		Find the terms of an arithmetic sequence.
	Geometric Sequences	
		Apply the formula of a geometric sequence.
		Determine if a sequence is geometric.
		Find terms of a geometric sequence.
		Find the common ratio of a geometric sequence.
	Summation Notation	
		Convert between series in summation notation and expanded form.
		Evaluate a summation by expanding it.
	Arithmetic Series	
		Solve problems using the formula for the sum for an arithmetic series.
	Finite Geometric Series	
		Solve problems using the formula for the sum of a finite geometric series.
	Infinite Geometric Series	
		Determine if an infinite geometric series converges.
		Evaluate the sum of an infinite geometric series.
		Find a partial sum of an infinite geometric series.
	Recursive Formulas	
		Write a rule for a recursively defined function.
		Write the first n terms of a recursive function given a formula and a term.
	Modeling with Sequences and Series	
		Determine if a sequence or series is arithmetic or geometric.
		Solve real-world problems involving sequences.
		Solve real-world problems involving series.