Unit	Lesson	Lesson Objectives
Functions and Modeling		
	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.
	Functions and Transformations	
		Describe the effect of one or more transformations on the graph of a function.
		Graph a transformation of a function.
		Recognize even and odd functions.
		Write the equation of a transformed function given its graph.
	Composition of Functions and Modeling	
		Identify the functions that make up a composite function.
		Justify why function composition is not commutative.
		Use a composition of two functions to model and solve a real-world problem.
	Comparing a Function and Its Inverse	
		Compare and contrast characteristics of a function and its inverse.
		Verify two functions are inverses of each other using graphs or tables.
	Inverse of a Function	
		Determine the additive or multiplicative inverse of a function or its characteristics.
		Determine values of an inverse function from a table or graph.
		Find the inverse of a function, restricting the domain when necessary.
		Verify that functions are inverses.
	Polynomial Inequalities	
		Apply polynomial inequalities to mathematical and real-world problems.
		Solve polynomial inequalities having real coefficients.
	Rational Inequalities	
		Solve rational inequalities algebraically and determine extraneous solutions.
	Modeling with Exponential and Logarithmic Equations	
		Model and solve real-world problems using exponential and logarithmic functions.
	Exponential and Logarithmic Inequalities	
		Interpret a graphical solution to an exponential or logarithmic inequality.
		Solve a problem by graphing an exponential or logarithmic inequality.

Unit	Lesson	Lesson Objectives
Trigonometry		
	Angles and Trigonometric Functions	
		Convert between radian and degree measure.
		Evaluate trigonometric functions.
		Use the unit circle to explain key features of the sine and cosine functions.
		Use trigonometric functions to solve problems.
	Linear and Angular Velocity	
		Solve problems involving angular velocity.
		Solve problems involving linear velocity.
	Graphing Sine and Cosine Functions	
		Describe the result of a stretch, compression, or reflection over the *x* -axis on the sine or cosine function.
		Graph a stretch, compression, or reflection over the *x* -axis of the sine or cosine function.
		Graph the sine or cosine function, attending to units on the horizontal axis.
		Interpret key features of a sine or cosine function that models a real-world context.
	General Form of Sine and Cosine	
		Create an appropriate periodic function to model a real-world context.
		Describe the result of a vertical or horizontal shift on the sine or cosine function.
		Graph a vertical or horizontal shift of the sine or cosine function.
		Interpret key features of a sine or cosine function that models a real-world context.
	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.
	Inverse Trigonometric Functions	
		Determine the key features of an inverse trigonometric function.
		Evaluate expressions containing inverse trigonometric functions.
		Graph an inverse trigonometric function.
		Use inverse functions to solve trigonometric equations that model real-world scenarios.
	Performance Task: Modeling with Sinusoidal Functions	
Analytic Trigonometry		
	Trigonometric Difference Identities	
		Prove the trigonometric subtraction identities for sine, cosine, or tangent.
		Solve a trigonometric equation involving a subtraction identity for sine, cosine, or tangent.
		Use a trigonometric subtraction identity for sine, cosine, or tangent to find the exact trigonometric value of an angle.
		Use a trigonometric subtraction identity for sine, cosine, or tangent to simplify an expression or verify an identity.

Unit	Lesson	Lesson Objectives
	Trigonometric Sum Identities	
		Prove the trigonometric addition identity for sine, cosine, or tangent.
		Solve a trigonometric equation involving an addition identity for sine, cosine, or tangent.
		Use a trigonometric addition identity for sine, cosine, or tangent to find the exact trigonometric value of an angle.
		Use a trigonometric addition identity for sine, cosine, or tangent to simplify an expression or verify an identity.
	Trigonometric Double Angle Identities	
		Prove the trigonometric double angle identities for sine, cosine, or tangent.
		Solve a trigonometric equation involving a double angle identity for sine, cosine, or tangent.
		Use a trigonometric double angle identity for sine, cosine, or tangent to find the exact trigonometric value of an angle.
		Use a trigonometric double angle identity for sine, cosine, or tangent to simplify an expression or verify an identity.
	Trigonometric Half Angle Identities	
		Prove the trigonometric half-angle identity for sine, cosine, or tangent.
		Solve a trigonometric equation involving a half-angle identity for sine, cosine, or tangent.
		Use a trigonometric half-angle identity for sine, cosine, or tangent to find the exact trigonometric value of an angle.
		Use a trigonometric half-angle identity for sine, cosine, or tangent to simplify an expression or verify an identity.
	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.
	Solving Trigonometric Inequalities	
		Solve trigonometric inequalities by graphing.
Complex Numbers and Polar Coordinates		
	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.
	Polar Form of Complex Numbers	
		Convert between the rectangular and polar form of a complex number, or between rectangular and polar coordinates.
		Explain why the rectangular and polar forms of a given complex number represent the same number.
		Find conjugates, moduli, and arguments of complex numbers.
		Graph points in the complex or polar plane given polar coordinates or the rectangular or polar form of a complex number.

Unit	Lesson	Lesson Objectives
	Graphing Polar Equations	
		Convert between polar and rectangular equations.
		Graph or describe the graph of a polar equation.
		Solve a problem involving one or more polar equations.
		Use a polar equation to represent a real-world scenario or interpret parts of a polar equation in terms of a context.
	Add and Subtract Complex Numbers	
		Find a sum or difference of complex numbers.
		Identify a geometric representation for the sum or difference of complex numbers.
	Multiply and Divide Complex Numbers	
		Find a product or quotient of complex numbers.
		Identify a geometric representation for the product or quotient of complex numbers.
	Powers and Roots of Complex Numbers	
		Find roots of complex numbers.
		Prove de Moivre's theorem.
		Use de Moivre's theorem to calculate a power of a complex number.
Vectors		
	Vectors and Their Components	
		Compute the result of multiplying a vector by a scalar.
		Determine the direction, magnitude, or components of a vector.
		Use multiplication of a vector by a scalar to model or solve a problem.
	Vector Addition and Subtraction	
		Add vectors geometrically or algebraically.
		Calculate the result of performing two or more of the following operations on vectors: addition, subtraction, scalar multiplication.
		Subtract vectors geometrically or algebraically.
	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.
	Applying Vectors in the Plane	
		Solve a real-world problem involving vector quantities.
		Use vectors to model a real-world problem.
		Write a trigonometric equation that models a real-world problem involving vectors.

Unit	Lesson	Lesson Objectives
	Dot Product and Work	
		Calculate the dot product of two vectors.
		Interpret the dot product of two vectors.
		Use the dot product to calculate the angle between two vectors.
		Use the dot product to solve work problems.
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.
Systems and Matrices		
	Cramer's Rule	
		Solve a system of equations using Cramer's rule.
	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.
	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.

Unit	Lesson	Lesson Objectives
	Partial Fractions	
		Find the partial fraction decomposition of a rational expression.
		Write a rational expression as a sum of fractions that can be used to find the partial decomposition.
Analytic Geometry		
	Conic Sections	
		Graph or determine key features (center, radius, vertex, directrix, focus) of a circle or parabola from a given equation.
		Identify the conic formed when a plane intersects a double napped cone.
		Write the equation of a circle or parabola given a graph or verbal description.
	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.
	Equations of Hyperbolas (continued)	
		Determine the center, foci, directrices, vertices, and asymptotes of a hyperbola from an equation or graph.
		Write the equation of a hyperbola from a given graph or information about its center, foci, directrices, or vertices.
	The General Equation of Conic Sections	
		Complete the square to write the equation of a conic section in standard form.
		Determine the type of conic from the general form of a given equation.
		Graph, or describe the graph of, a conic from a given equation in general form.
	Applications of Conics	
		Interpret the constants or coefficients in the equation of a quadratic relation in terms of a context.
		Use a quadratic relation to model a problem.
		Use a quadratic relation to solve a problem.
	Conic Inequalities	
		Graph, or describe how to graph, the solution set of a conic inequality.
		Justify the solution of a conic inequality.
	Systems of Inequalities	
		Analyze a system of nonlinear inequalities.
		Graph a system of nonlinear inequalities.
		Solve a mathematical or real-world problem involving a system of nonlinear inequalities.

Unit	Lesson	Lesson Objectives
	Graphing Parametric Equations	
		Convert between parametric equations and rectangular relations.
		Describe a planar curve given in parametric form.
		Graph parametric equations.
		Use parametric equations to model problems.
		Use parametric equations to solve problems.
	Performance Task: Graphing Conic Sections	
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.
	Summation Properties and Rules	
		Use summation properties and rules to evaluate sums.
	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.

Unit	Lesson	Lesson Objectives
	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.
Limits		
	Understanding the Concept of a Limit	
		Determine if a limit exists at a point and if so, its value.
		Estimate limits from graphs and tables.
		Find one-sided limits from graphs and tables.
	Limits and Continuity	
		Apply the extreme value theorem.
		Describe the behavior of a function around discontinuities.
		Determine the types of discontinuity of a function.
		Use limits to determine if a function is continuous at a point.
	Finding Limits	
		Find a limit algebraically.
	Limits, Asymptotes, and End Behavior	
		Use limits to determine a horizontal asymptote of a function.
		Use limits to determine a vertical asymptote of a function.
		Use limits to determine the end behavior of a function.
	Limits as They Relate to Sequences and Series	
		Determine the error caused when a series is truncated.
		Identify a limit of partial sums that represents an infinite series.
		Use limits to determine whether a sequence or series converges or diverges.