ABOUT *EUREKA MATH*

Created by the nonprofit Great Minds, *Eureka Math* helps teachers deliver unparalleled math instruction that provides students with a deep understanding and fluency in math. Crafted by teachers and math scholars, the curriculum carefully sequences the mathematical progressions to maximize coherence from Prekindergarten through Precalculus—a principle tested and proven to be essential in students' mastery of math.

Teachers and students using *Eureka Math* find the trademark "Aha!" moments in *Eureka Math* to be a source of joy and inspiration, lesson after lesson, year after year.

ALIGNED

Eureka Math is the only curriculum found by EdReports.org to align fully with the Common Core State Standards for Mathematics for all grades, Kindergarten through Grade 8. Great Minds offers detailed analyses which demonstrate how each grade of *Eureka Math* aligns with specific state standards. Access these free alignment studies at greatminds.org/state-studies.

DATA

Schools and districts nationwide are experiencing student growth and impressive test scores after using *Eureka Math*. See their stories and data at greatminds.org/data.

FULL SUITE OF RESOURCES

As a nonprofit, Great Minds offers the *Eureka Math* curriculum as PDF downloads for free, noncommercial use. Access the free PDFs at greatminds.org/math/curriculum.

The teacher–writers who created the curriculum have also developed essential resources, available only from Great Minds, including the following:

- Printed material in English and Spanish
- Digital resources
- Professional development
- Classroom tools and manipulatives
- Teacher support materials
- Parent resources

PRECALCULUS

The majority of the Precalculus South Carolina College- and Career-Ready Standards for Mathematics are fully covered by the Precalculus and Advanced Topics *Eureka Math* curriculum. The areas where the Precalculus South Carolina College- and Career-Ready Standards for Mathematics and Precalculus and Advanced Topics *Eureka Math* do not align will require the use of *Eureka Math* content from other courses. A detailed analysis of alignment is provided in the table below.

INDICATORS

Green indicates that the South Carolina standard is fully addressed in *Eureka Math*.

Yellow indicates that the South Carolina standard may not be completely addressed in *Eureka Math*.

Red indicates that the South Carolina standard is not addressed in *Eureka Math*.

Blue indicates there is a discrepancy between the grade level at which this standard is addressed in the South Carolina standards and in *Eureka Math*.

Mathematical Process Standards	Aligned Components of *Eureka Math*
1: Make sense of problems and persevere in solving them. a. Relate a problem to prior knowledge. b. Recognize there may be multiple entry points to a problem and more than one path to a solution. c. Analyze what is given, what is not given, what is being asked, and what strategies are needed, and make an initial attempt to solve a problem. d. Evaluate the success of an approach to solve a problem and refine it if necessary.	Lessons in every module engage students in making sense of problems and persevering in solving them as required by this standard. This process standard is analogous to the CCSSM Standards for Mathematical Practice 1, which is specifically addressed in the following modules: Precalculus and Advanced Topics M1: Complex Numbers and Transformations Precalculus and Advanced Topics M4: Trigonometry
2: Reason both contextually and abstractly. a. Make sense of quantities and their relationships in mathematical and real-world situations. b. Describe a given situation using multiple mathematical representations. c. Translate among multiple mathematical representations and compare the meanings each representation conveys about the situation. d. Connect the meaning of mathematical operations to the context of a given situation.	Lessons in every module engage students in reasoning abstractly and quantitatively as required by this standard. This process standard is analogous to the CCSSM Standards for Mathematical Practice 2, which is specifically addressed in the following modules: Precalculus and Advanced Topics M1: Complex Numbers and Transformations Precalculus and Advanced Topics M2: Vectors and Matrices Precalculus and Advanced Topics M5: Probability and Statistics

Mathematical Process Standards	Aligned Components of *Eureka Math*
3: Use critical thinking skills to justify mathematical reasoning and critique the reasoning of others. a. Construct and justify a solution to a problem. b. Compare and discuss the validity of various reasoning strategies. c. Make conjectures and explore their validity. d. Reflect on and provide thoughtful responses to the reasoning of others.	Lessons in every module engage students in constructing viable arguments and critiquing the reasoning of others as required by this standard. This process standard is analogous to the CCSSM Standards for Mathematical Practice 3, which is specifically addressed in the following modules: Precalculus and Advanced Topics M1: Complex Numbers and Transformations Precalculus and Advanced Topics M3: Rational and Exponential Functions Precalculus and Advanced Topics M4: Trigonometry Precalculus and Advanced Topics M5: Probability and Statistics

Mathematical Process Standards	Aligned Components of *Eureka Math*
4: Connect mathematical ideas and real-world situations through modeling. a. Identify relevant quantities and develop a model to describe their relationships. b. Interpret mathematical models in the context of the situation. c. Make assumptions and estimates to simplify complicated situations. d. Evaluate the reasonableness of a model and refine if necessary.	Lessons in every module engage students in modeling with mathematics as required by this standard. This process standard is analogous to the CCSSM Standards for Mathematical Practice 4, which is specifically addressed in the following modules: Precalculus and Advanced Topics M1: Complex Numbers and Transformations Precalculus and Advanced Topics M2: Vectors and Matrices Precalculus and Advanced Topics M4: Trigonometry Precalculus and Advanced Topics M5: Probability and Statistics
5: Use a variety of mathematical tools effectively and strategically. a. Select and use appropriate tools when solving a mathematical problem. b. Use technological tools and other external mathematical resources to explore and deepen understanding of concepts.	Lessons in every module engage students in using appropriate tools strategically as required by this standard. This process standard is analogous to the CCSSM Standards for Mathematical Practice 5, which is specifically addressed in the following modules: Precalculus and Advanced Topics M2: Vectors and Matrices Precalculus and Advanced Topics M4: Trigonometry Precalculus and Advanced Topics M5: Probability and Statistics

Mathematical Process Standards	Aligned Components of *Eureka Math*
6: Communicate mathematically and approach mathematical situations with precision. a. Express numerical answers with the degree of precision appropriate for the context of a situation. b. Represent numbers in an appropriate form according to the context of the situation. c. Use appropriate and precise mathematical language. d. Use appropriate units, scales, and labels.	Lessons in every module engage students in attending to precision as required by this standard. This process standard is analogous to the CCSSM Standards for Mathematical Practice 6, which is specifically addressed in the following modules: Precalculus and Advanced Topics M1: Complex Numbers and Transformations Precalculus and Advanced Topics M2: Vectors and Matrices Precalculus and Advanced Topics M3: Rational and Exponential Functions
7: Identify and utilize structure and patterns. a. Recognize complex mathematical objects as being composed of more than one simple object. b. Recognize mathematical repetition in order to make generalizations. c. Look for structures to interpret meaning and develop solution strategies.	Lessons in every module engage students in looking for and making use of structure as required by this standard. This process standard is analogous to the CCSSM Standards for Mathematical Practice 7 and 8, which are specifically addressed in the following modules: Precalculus and Advanced Topics M3: Rational and Exponential Functions Precalculus and Advanced Topics M5: Probability and Statistics

Key Concepts	Content Standards for Mathematics		Aligned Components of *Eureka Math*
Arithmetic with Polynomials and Rational Expressions	**PC.AAPR.2** Know and apply the Division Theorem and the Remainder Theorem for polynomials.		Algebra II M1 Lesson 19: The Remainder Theorem
	PC.AAPR.3 Graph polynomials identifying zeros when suitable factorizations are available and indicating end behavior. Write a polynomial function of least degree corresponding to a given graph.		Algebra II M1 Lesson 14: Graphing Factored Polynomials Algebra II M1 Lesson 15: Structure in Graphs of Polynomial Functions Algebra II M1 Lesson 16: Modeling with Polynomials—An Introduction
	PC.AAPR.4 Prove polynomial identities and use them to describe numerical relationships.		Algebra II M1 Lesson 13: Mastering Factoring Precalculus and Advanced Topics M3 Lesson 3: Roots of Unity
	PC.AAPR.5 Apply the Binomial Theorem to expand powers of binomials, including those with one and with two variables. Use the Binomial Theorem to factor squares, cubes, and fourth powers of binomials.		Precalculus and Advanced Topics M3 Lessons 4–5: The Binomial Theorem

Key Concepts	Content Standards for Mathematics	Aligned Components of *Eureka Math*
	PC.AAPR.6 Apply algebraic techniques to rewrite simple rational expressions in different forms; using inspection, long division, or, for the more complicated examples, a computer algebra system.	Algebra II M1 Lesson 4: Comparing Methods—Long Division, Again? Algebra II M1 Lesson 18: Overcoming a Second Obstacle in Factoring—What If There Is a Remainder? Algebra II M1 Lesson 22: Equivalent Rational Expressions Algebra II M1 Lesson 24: Multiplying and Dividing Rational Expressions Algebra II M1 Lesson 25: Adding and Subtracting Rational Expressions
	PC.AAPR.7 Understand that rational expressions form a system analogous to the rational numbers, closed under addition, subtraction, multiplication, and division by a nonzero rational expression; add, subtract, multiply, and divide rational expressions.	Algebra II M1 Lesson 22: Equivalent Rational Expressions Algebra II M1 Lesson 23: Comparing Rational Expressions Algebra II M1 Lesson 24: Multiplying and Dividing Rational Expressions Algebra II M1 Lesson 25: Adding and Subtracting Rational Expressions
Reasoning with Equations and Inequalities	**PC.AREI.7** Solve a simple system consisting of a linear equation and a quadratic equation in two variables algebraically and graphically. Understand that such systems may have zero, one, two, or infinitely many solutions.	Algebra II M1 Lesson 31: Systems of Equations Algebra II M1 Lesson 32: Graphing Systems of Equations Algebra II M1 Lesson 36: Overcoming a Third Obstacle to Factoring—What If There Are No Real Number Solutions?

Key Concepts	Content Standards for Mathematics		Aligned Components of *Eureka Math*
	PC.AREI.8 Represent a system of linear equations as a single matrix equation in a vector variable.		Precalculus and Advanced Topics M2 Topic C: Systems of Linear Equations
	PC.AREI.9 Using technology for matrices of dimension 3×3 or greater, find the inverse of a matrix if it exists and use it to solve systems of linear equations.		Precalculus and Advanced Topics M2 Topic C: Systems of Linear Equations
	PC.AREI.11 Solve an equation of the form $f(x) = g(x)$ graphically by identifying the x-coordinate(s) of the point(s) of intersection of the graphs of $y = f(x)$ and $y = g(x)$.		Algebra I M3 Lesson 16: Graphs Can Solve Equations Too Algebra II M1 Lesson 36: Overcoming a Third Obstacle to Factoring—What If There Are No Real Number Solutions? Algebra II M3 Lesson 24: Solving Exponential Equations
Structure and Expressions	**PC.ASE.1** Interpret the meanings of coefficients, factors, terms, and expressions based on their real-world contexts. Interpret complicated expressions as being composed of simpler expressions.		Algebra II M1 Lesson 14: Graphing Factored Polynomials Algebra II M1 Lesson 15: Structure in Graphs of Polynomial Functions Algebra II M3 Topic D: Using Logarithms in Modeling Situations

Key Concepts	Content Standards for Mathematics		Aligned Components of *Eureka Math*
	PC.ASE.2 Analyze the structure of binomials, trinomials, and other polynomials in order to rewrite equivalent expressions.		Algebra II M1 Topic A: Polynomials—From Base Ten to Base X Algebra II M1 Lesson 12: Overcoming Obstacles in Factoring Algebra II M1 Lesson 13: Mastering Factoring Algebra II M3 Lesson 12: Properties of Logarithms Algebra II M3 Lesson 14: Solving Logarithmic Equations Algebra II M3 Lesson 15: Why Were Logarithms Developed?
	PC.ASE.4 Derive the formula for the sum of a finite geometric series (when the common ratio is not 1), and use the formula to solve problems including applications to finance.		Algebra II M3 Topic E: Geometric Series and Finance
Building Functions	**PC.FBF.1** Write a function that describes a relationship between two quantities.		
	b. Combine functions using the operations addition, subtraction, multiplication, and division to build new functions that describe the relationship between two quantities in mathematical and real-world situations.		Algebra II M2 Lesson 12: Ferris Wheels—Using Trigonometric Functions to Model Cyclical Behavior Algebra II M3 Lesson 28: Newton's Law of Cooling, Revisited Algebra II M3 Lesson 30: Buying a Car Algebra II M3 Lesson 33: The Million Dollar Problem

Key Concepts	Content Standards for Mathematics	Aligned Components of *Eureka Math*
	PC.FBF.3 Describe the effect of the transformations $kf(x)$, $f(x) + k$, $f(x + k)$, and combinations of such transformations on the graph of $y = f(x)$ for any real number k. Find the value of k given the graphs and write the equation of a transformed parent function given its graph.	Algebra II M1 Lesson 15: Structure in Graphs of Polynomial Functions Algebra II M2 Lesson 11: Transforming the Graph of the Sine Function Algebra II M2 Lesson 12: Ferris Wheels—Using Trigonometric Functions to Model Cyclical Behavior Algebra II M3 Lesson 20: Transformations of the Graphs of Logarithmic and Exponential Functions Precalculus and Advanced Topics M1 Lesson 3: Which Real Number Functions Define a Linear Transformation? Precalculus and Advanced Topics M3 Lesson 15: Transforming Rational Functions Precalculus and Advanced Topics M4 Lesson 11: Revisiting the Graphs of the Trigonometric Functions

Key Concepts	Content Standards for Mathematics		Aligned Components of *Eureka Math*
	PC.FBF.4 Understand that an inverse function can be obtained by expressing the dependent variable of one function as the independent variable of another, as f and g are inverse functions if and only if $f(x) = y$ and $g(y) = x$, for all values of x in the domain of f and all values of y in the domain of g, and find inverse functions for one-to-one function or by restricting the domain.		
	a. Use composition to verify one function is an inverse of another.		Precalculus and Advanced Topics M3 Topic C: Inverse Functions
	b. If a function has an inverse, find values of the inverse function from a graph or table.		Precalculus and Advanced Topics M3 Topic C: Inverse Functions
	PC.FBF.5 Understand and verify through function composition that exponential and logarithmic functions are inverses of each other and use this relationship to solve problems involving logarithms and exponents.		Precalculus and Advanced Topics M3 Topic C: Inverse Functions

Key Concepts	Content Standards for Mathematics		Aligned Components of *Eureka Math*
Interpreting Functions	**PC.FIF.4** Interpret key features of a function that models the relationship between two quantities when given in graphical or tabular form. Sketch the graph of a function from a verbal description showing key features. Key features include intercepts; intervals where the function is increasing, decreasing, constant, positive, or negative; relative maximums and minimums; symmetries; end behavior and periodicity.		Precalculus and Advanced Topics M3 Topic B: Rational Functions and Composition of Functions
	PC.FIF.5 Relate the domain and range of a function to its graph and, where applicable, to the quantitative relationship it describes.		Precalculus and Advanced Topics M3: Rational and Exponential Functions
	PC.FIF.6 Given a function in graphical, symbolic, or tabular form, determine the average rate of change of the function over a specified interval. Interpret the meaning of the average rate of change in a given context.		Precalculus and Advanced Topics M3 Lesson 5: The Binomial Theorem

Key Concepts	Content Standards for Mathematics		Aligned Components of *Eureka Math*
	PC.FIF.7 Graph functions from their symbolic representations. Indicate key features including intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior and periodicity. Graph simple cases by hand and use technology for complicated cases.		
	a. Graph rational functions, identifying zeros and asymptotes when suitable factorizations are available, and showing end behavior.		Precalculus and Advanced Topics M3 Topic B: Rational Functions and Composition of Functions
	b. Graph radical functions over their domain show end behavior.		Algebra I M4 Topic C: Function Transformations and Modeling
	c. Graph exponential and logarithmic functions, showing intercepts and end behavior.		Algebra II M3 Lesson 16: Rational and Irrational Numbers Algebra II M3 Lesson 18: Graphs of Exponential Functions and Logarithmic Functions Algebra II M3 Lesson 33: The Million Dollar Problem Precalculus and Advanced Topics M3 Topic C: Inverse Functions

Key Concepts	Content Standards for Mathematics	Aligned Components of *Eureka Math*
	d. Graph trigonometric functions, showing period, midline, and amplitude.	Algebra II M2 Lesson 8: Graphing the Sine and Cosine Functions Algebra II M2 Lesson 11: Transforming the Graph of the Sine Function Algebra II M2 Lesson 12: Ferris Wheels—Using Trigonometric Functions to Model Cyclical Behavior Algebra II M3 Lesson 33: The Million Dollar Problem Precalculus and Advanced Topics M4 Lesson 6: Waves, Sinusoids, and Identities Precalculus and Advanced Topics M4 Lesson 11: Revisiting the Graphs of the Trigonometric Functions
Linear, Quadratic, and Exponential	**PC. FLQE.4** For exponential models, express as a logarithm the solution to $ab^{ct} = d$ where a, c, and d are numbers and the base b is 2, 10, or e; evaluate the logarithm using technology.	Algebra II M3 Topic B: Logarithms Algebra II M3 Lesson 19: The Inverse Relationship Between Logarithmic and Exponential Functions Algebra II M3 Topic D: Using Logarithms in Modeling Situations
Trigonometry	**PC.FT.1** Understand that the radian measure of an angle is the length of the arc on the unit circle subtended by the angle.	Algebra II M2 Lesson 9: Awkward! Who Chose the Number 360, Anyway?

Key Concepts	Content Standards for Mathematics		Aligned Components of *Eureka Math*
	PC.FT.2 Define sine and cosine as functions of the radian measure of an angle in terms of the x- and y-coordinates of the point on the unit circle corresponding to that angle and explain how these definitions are extensions of the right triangle definitions.		
	a. Define the tangent, cotangent, secant, and cosecant functions as ratios involving sine and cosine.		Geometry M2 Lesson 25: Incredibly Useful Ratios Geometry M2 Lesson 26: The Definition of Sine, Cosine, and Tangent
	b. Write cotangent, secant, and cosecant functions as the reciprocals of tangent, cosine, and sine, respectively.		Geometry M2 Lesson 25: Incredibly Useful Ratios Geometry M2 Lesson 26: The Definition of Sine, Cosine, and Tangent
	PC.FT.3 Use special triangles to determine geometrically the values of sine, cosine, tangent for $\pi/3$, $\pi/4$, and $\pi/6$, and use the unit circle to express the values of sine, cosine, and tangent for $\pi - x$, $\pi + x$, and $2\pi - x$ in terms of their values for x, where x is any real number.		Algebra II M2 Lesson 4: From Circle-ometry to Trigonometry Algebra II M2 Lesson 5: Extending the Domain of Sine and Cosine to All Real Numbers Algebra II M2 Lesson 6: Why Call It Tangent? Algebra II M2 Lesson 10: Basic Trigonometric Identities from Graphs Precalculus and Advanced Topics M4 Lesson 1: Special Triangles and the Unit Circle

Key Concepts	Content Standards for Mathematics		Aligned Components of *Eureka Math*
	PC.FT.4 Use the unit circle to explain symmetry (odd and even) and periodicity of trigonometric functions.		Precalculus and Advanced Topics M4 Lesson 2: Properties of Trigonometric Functions
	PC.FT.5 Choose trigonometric functions to model periodic phenomena with specified amplitude, frequency, and midline.		Algebra II M2 Lesson 11: Transforming the Graph of the Sine Function Algebra II M2 Lesson 12: Ferris Wheels—Using Trigonometric Functions to Model Cyclical Behavior Algebra II M2 Lesson 13: Tides, Sound Waves, and Stock Markets Precalculus and Advanced Topics M4 Lesson 6: Waves, Sinusoids, and Identities
	PC.FT.6 Define the six inverse trigonometric functions using domain restrictions for regions where the function is always increasing or always decreasing.		Precalculus and Advanced Topics M4 Topic C: Inverse Trigonometric Functions
	PC.FT.7 Use inverse functions to solve trigonometric equations that arise in modeling contexts; evaluate the solutions using technology, and interpret them in terms of the context.		Precalculus and Advanced Topics M4 Topic C: Inverse Trigonometric Functions

Key Concepts	Content Standards for Mathematics		Aligned Components of *Eureka Math*
	PC.FT.8 Justify the Pythagorean, even/odd, and cofunction identities for sine and cosine using their unit circle definitions and symmetries of the unit circle and use the Pythagorean identity to find sin A, cos A, or tan A, given sin A, cos A, or tan A, and the quadrant of the angle.		Algebra II M2 Topic B: Understanding Trigonometric Functions and Putting Them to Use Precalculus and Advanced Topics M4 Topic A: Trigonometric Functions Precalculus and Advanced Topics M4 Lesson 11: Revisiting the Graphs of the Trigonometric Functions
	PC.FT.9 Justify the sum and difference formulas for sine, cosine, and tangent and use them to solve problems.		Precalculus and Advanced Topics M4 Topic A: Trigonometric Functions
Circles	**PC.GCI.5** Derive the formulas for the length of an arc and the area of a sector in a circle, and apply these formulas to solve mathematical and real-world problems.		Geometry M5 Topic B: Arcs and Sectors
Expressing Geometric Properties with Equations	**PC.GGPE.2** Use the geometric definition of a parabola to derive its equation given the focus and directrix.		Algebra II M1 Lesson 33: The Definition of a Parabola Algebra II M1 Lesson 34: Are All Parabolas Congruent? Algebra II M1 Lesson 35: Are All Parabolas Similar?
	PC.GGPE.3 Use the geometric definition of an ellipse and of a hyperbola to derive the equation of each given the foci and points whose sum or difference of distance from the foci are constant.		Precalculus and Advanced Topics M3 Lesson 6: Curves in the Complex Plane Precalculus and Advanced Topics M3 Lessons 7–8: Curves from Geometry

Key Concepts	Content Standards for Mathematics		Aligned Components of *Eureka Math*
Similarity, Right Triangles, and Trigonometry	**PC.GSRT.9** Derive the formula $A = 1/2\ ab \sin C$ for the area of a triangle by drawing an auxiliary line from a vertex perpendicular to the opposite side.		Precalculus and Advanced Topics M4 Lesson 7: An Area Formula for Triangles
	PC.GSRT.10 Prove the Laws of Sines and Cosines and use them to solve problems.		Precalculus and Advanced Topics M4 Topic B: Trigonometry and Triangles
	PC.GSRT.11 Use the Law of Sines and the Law of Cosines to solve for unknown measures of sides and angles of triangles that arise in mathematical and real-world problems.		Precalculus and Advanced Topics M4 Topic B: Trigonometry and Triangles
Complex Number System	**PC.NCNS.2** Use the relation $i^2 = -1$ and the commutative, associative, and distributive properties to add, subtract, and multiply complex numbers.		Precalculus and Advanced Topics M1 Lessons 4–5: An Appearance of Complex Numbers
	PC.NCNS.3 Find the conjugate of a complex number in rectangular and polar forms and use conjugates to find moduli and quotients of complex numbers.		Precalculus and Advanced Topics M1 Lessons 7–8: Complex Number Division Precalculus and Advanced Topics M1 Lesson 9: The Geometric Effect of Some Complex Arithmetic Precalculus and Advanced Topics M1 Lesson 17: The Geometric Effect of Multiplying by a Reciprocal

Key Concepts	Content Standards for Mathematics		Aligned Components of *Eureka Math*
	PC.NCNS.4 Graph complex numbers on the complex plane in rectangular and polar form and explain why the rectangular and polar forms of a given complex number represent the same number.		Precalculus and Advanced Topics M1: Complex Numbers and Transformations
	PC.NCNS.5 Represent addition, subtraction, multiplication, and conjugation of complex numbers geometrically on the complex plane; use properties of this representation for computation.		Precalculus and Advanced Topics M1 Lesson 6: Complex Numbers as Vectors Precalculus and Advanced Topics M1 Topic B: Complex Number Operations as Transformations Precalculus and Advanced Topics M1 Lessons 18–19: Exploiting the Connection to Trigonometry Precalculus and Advanced Topics M1 Lesson 20: Exploiting the Connection to Cartesian Coordinates Precalculus and Advanced Topics M2 Lesson 4: Linear Transformations Review
	PC.NCNS.6 Determine the modulus of a complex number by multiplying by its conjugate and determine the distance between two complex numbers by calculating the modulus of their difference.		Precalculus and Advanced Topics M1 Lessons 11–12: Distance and Complex Numbers

Key Concepts	Content Standards for Mathematics		Aligned Components of *Eureka Math*
	PC.NCNS.7 Solve quadratic equations in one variable that have complex solutions.		Algebra II M1 Lesson 38: Complex Numbers as Solutions to Equations Algebra II M1 Lesson 39: Factoring Extended to the Complex Realm Precalculus and Advanced Topics M3 Lesson 1: Solutions to Polynomial Equations Precalculus and Advanced Topics M3 Lesson 2: Does Every Complex Number Have a Square Root? Precalculus and Advanced Topics M3 Lesson 3: Roots of Unity
	PC.NCNS.8 Extend polynomial identities to the complex numbers and use DeMoivre's Theorem to calculate a power of a complex number.		Precalculus and Advanced Topics M1 Lesson 18: Exploiting the Connection to Trigonometry
	PC.NCNS.9 Know the Fundamental Theorem of Algebra and explain why complex roots of polynomials with real coefficients must occur in conjugate pairs.		Precalculus and Advanced Topics M3 Lesson 1: Solutions to Polynomial Equations Precalculus and Advanced Topics M3 Lesson 2: Does Every Complex Number Have a Square Root? Precalculus and Advanced Topics M3 Lesson 3: Roots of Unity

Key Concepts	Content Standards for Mathematics		Aligned Components of *Eureka Math*
Vector and Matrix Quantities	**PC.NVMQ.1** Recognize vector quantities as having both magnitude and direction. Represent vector quantities by directed line segments, and use appropriate symbols for vectors and their magnitudes.		Precalculus and Advanced Topics M2 Lesson 17: Vectors in the Coordinate Plane Precalculus and Advanced Topics M2 Lesson 18: Vectors and Translation Maps Precalculus and Advanced Topics M2 Lesson 20: Vectors and Stone Bridges
	PC.NVMQ.2 Represent and model with vector quantities. Use the coordinates of an initial point and of a terminal point to find the components of a vector.		Precalculus and Advanced Topics M2 Lesson 19: Directed Line Segments and Vectors Precalculus and Advanced Topics M2 Lesson 20: Vectors and Stone Bridges
	PC.NVMQ.3 Represent and model with vector quantities. Solve problems involving velocity and other quantities that can be represented by vectors.		Precalculus and Advanced Topics M2 Lesson 20: Vectors and Stone Bridges Precalculus and Advanced Topics M2 Lesson 23: Why Are Vectors Useful?

Key Concepts	Content Standards for Mathematics		Aligned Components of *Eureka Math*
	PC.NVMQ.4 Perform operations on vectors.		
	a. Add and subtract vectors using components of the vectors and graphically.		Precalculus and Advanced Topics M2 Lesson 5: Coordinates of Points in Space Precalculus and Advanced Topics M2 Lesson 6: Linear Transformations as Matrices Precalculus and Advanced Topics M2 Lesson 17: Vectors in the Coordinate Plane Precalculus and Advanced Topics M2 Lesson 18: Vectors and Translation Maps Precalculus and Advanced Topics M2 Lesson 20: Vectors and Stone Bridges
	b. Given the magnitude and direction of two vectors, determine the magnitude of their sum and of their difference.		Precalculus and Advanced Topics M2 Topic D: Vectors in Plane and Space
	PC.NVMQ.5 Multiply a vector by a scalar, representing the multiplication graphically and computing the magnitude of the scalar multiple.		Precalculus and Advanced Topics M2 Lesson 5: Coordinates of Points in Space Precalculus and Advanced Topics M2 Lesson 6: Linear Transformations as Matrices Precalculus and Advanced Topics M2 Lesson 17: Vectors in the Coordinate Plane Precalculus and Advanced Topics M2 Lesson 18: Vectors and Translation Maps

Key Concepts	Content Standards for Mathematics	Aligned Components of *Eureka Math*
	PC.NVMQ.6 Use matrices to represent and manipulate data.	Precalculus and Advanced Topics M2 Topic A: Networks and Matrices
	PC.NVMQ.7 Perform operations with matrices of appropriate dimensions including addition, subtraction, and scalar multiplication.	Precalculus and Advanced Topics M1 Lesson 22: Modeling Video Game Motion with Matrices Precalculus and Advanced Topics M1 Lesson 24: Matrix Notation Encompasses New Transformations! Precalculus and Advanced Topics M1 Lesson 25: Matrix Multiplication and Addition Precalculus and Advanced Topics M2: Vectors and Matrices
	PC.NVMQ.8 Understand that, unlike multiplication of numbers, matrix multiplication for square matrices is not a commutative operation, but still satisfies the associative and distributive properties.	Precalculus and Advanced Topics M2 Lesson 10: Matrix Multiplication Is Not Commutative Precalculus and Advanced Topics M2 Lesson 12: Matrix Multiplication Is Distributive and Associative
	PC.NVMQ.9 Understand that the zero and identity matrices play a role in matrix addition and multiplication similar to the role of 0 and 1 in the real numbers. The determinant of a square matrix is nonzero if and only if the matrix has a multiplicative inverse.	Precalculus and Advanced Topics M1 Topic C: The Power of the Right Notation Precalculus and Advanced Topics M2 Lesson 6: Linear Transformations as Matrices Precalculus and Advanced Topics M2 Lesson 13: Using Matrix Operations for Encryption Precalculus and Advanced Topics M2 Topic C: Systems of Linear Equations

Key Concepts	Content Standards for Mathematics	Aligned Components of *Eureka Math*
	PC.NVMQ.10 Multiply a vector by a matrix of appropriate dimension to produce another vector. Work with matrices as transformations of vectors.	Precalculus and Advanced Topics M1 Lesson 21: The Hunt for Better Notation Precalculus and Advanced Topics M1 Lessons 22–23: Modeling Video Game Motion with Matrices Precalculus and Advanced Topics M2 Lesson 4: Linear Transformations Review Precalculus and Advanced Topics M2 Lesson 7: Linear Transformations Applied to Cubes Precalculus and Advanced Topics M2 Lesson 11: Matrix Addition Is Commutative Precalculus and Advanced Topics M2 Topic D: Vectors in Plane and Space Precalculus and Advanced Topics M2 Topic E: First-Person Video Games—Projection Matrices
	PC.NVMQ.11 Apply 2 × 2 matrices as transformations of the plane, and interpret the absolute value of the determinant in terms of area.	Precalculus and Advanced Topics M1 Topic C: The Power of the Right Notation Precalculus and Advanced Topics M2 Lesson 8: Composition of Linear Transformations