

Topic: Conics

Days: 7

Subject(s):

Grade(s):

Key Learning:

Identify and graph conic sections from equations



Unit Essential Question(s):

How are conic sections identified and how can they be used to solve problems?



<p>Concept: Distance and midpoint formula</p> <p>CC.2.3.HS.C.3</p>	<p>Concept: Parabolas</p> <p>CC.2.2.HS.C.1</p> <p>CC.2.2.HS.C.2</p>	<p>Concept: Circles</p> <p>CC.2.2.HS.C.1</p> <p>CC.2.2.HS.C.2</p>
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<p>Lesson Essential Question(s): How can one find the distance between two points in a coordinate plane? (A)</p>	<p>Lesson Essential Question(s): How is the equation of a parabola identified? How is it graphed? (A)</p>	<p>Lesson Essential Question(s): How is the equation of a circle written? (A)</p>
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<p>Vocabulary: coordinate plane, midpoint</p>	<p>Vocabulary: parabola, focus, directrix</p>	<p>Vocabulary: center, radius, diameter</p>
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Topic: Conics

Days: 7

Subject(s):

Grade(s):

Concept: Ellipses CC.2.2.HS.C.1 CC.2.2.HS.C.2	Concept: Hyperbolas CC.2.2.HS.C.1 CC.2.2.HS.C.2	Concept: Conic sections CC.2.2.HS.C.1 CC.2.2.HS.C.2
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Lesson Essential Question(s): How is the equation of an ellipse written? (A)	Lesson Essential Question(s): What does the equation of a hyperbola look like? How do I draw them? (A)	Lesson Essential Question(s): What does a conic section equation look like? (A)
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Vocabulary: ellipse, foci	Vocabulary: foci, origin, asymptotes	Vocabulary: circle, ellipse, hyperbola, parabola
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Additional Information:

Attached Document(s):

Topic: Equations and Inequalities

Days: 7

Subject(s):

Grade(s):

Key Learning:
Properties of real numbers and using them to solve equations



Unit Essential Question(s):
What are equations and inequalities and how are they solved?

<p>Concept: Solving expressions and formulas <small>CC.2.2.HSD.1, CC.2.1.HSF.2</small></p>	<p>Concept: Properties of real numbers <small>CC.2.2.HSD.1, CC.2.1.HSF.2</small></p>	<p>Concept: Solving equations <small>CC.2.2.HS.D.2, CC.2.2.HS.D.1</small></p>
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<p>Lesson Essential Question(s): How are expressions evaluated correctly? How are expressions solved using formulas? (A)</p>	<p>Lesson Essential Question(s): Where do I belong? How are number properties used to solve equations? (A)</p>	<p>Lesson Essential Question(s): How are the properties of equals used to solve equations? (A)</p>
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<p>Vocabulary: parentheses, formula, brackets</p>	<p>Vocabulary: irrational, real, whole, integer, rational, natural</p>	<p>Vocabulary: symmetric and transitive, reflective</p>
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<p>Concept: Applications of equations <small>CC.2.2.HSD.1, CC.2.2.HSD.2</small></p>	<p>Concept: Solving absolute functions CC.2.2.HS.C.5</p>	<p>Concept: Solving inequalities <small>CC.2.2.HS.D.2</small></p>
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<p>Lesson Essential Question(s): How are words translated to numbers and expressions? How are word expressions translated to equations and how are they solved? (A)</p>	<p>Lesson Essential Question(s): How are equations using absolute value solved? (A)</p>	<p>Lesson Essential Question(s): How do I solve an inequality and graph its solution? (A)</p>
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<p>Vocabulary:</p>	<p>Vocabulary: absolute value</p>	<p>Vocabulary:</p>
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Additional Information:

Attached Document(s):

Topic: Linear Equations and Functions

Days: 6

Subject(s):

Grade(s):

Key Learning:

The difference between relations and functions



Unit Essential Question(s):

What are the differences between relations and functions?



<p>Concept: Relations and functions</p> <p>CC.2.2.HS.C.1</p>	<p>Concept: Linear Functions</p> <p>CC.2.2.HS.C.1 CC.2.2.HS.C.2</p>	<p>Concept: Slopes and intercepts</p> <p>CC.2.2.HS.C.2</p>
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<p>Lesson Essential Question(s): How do I graph a relation, state it's range and domain, and determine if it is a function? (A)</p>	<p>Lesson Essential Question(s): How are linear equations identified and graphed? (A)</p>	<p>Lesson Essential Question(s): How is the slope and slope intercept of a line determined? How can the use of slope determine if lines are parallel or perpendicular? (A)</p>
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<p>Vocabulary: domain, range, ordered pair</p>	<p>Vocabulary: open sentence, standard form</p>	<p>Vocabulary: slope, rise, run, plane</p>
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Topic: Linear Equations and Functions

Days: 6

Subject(s):

Grade(s):

<p>Concept: Writing linear equations</p> <p>CC.2.2.HS.C.2 CC.2.2.HS.C.3</p>	<p>Concept: Scatter plots and prediction equations</p> <p>CC.2.2.HS.C.3 CC.2.2.HS.D.7</p>	<p>Concept: Special functions and linear inequalities</p> <p>CC.2.2.HS.C.2</p>
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<p>Lesson Essential Question(s): (A)</p>	<p>Lesson Essential Question(s): What is a scatter plot? What is a prediction equation? What is a best fit line? (A)</p>	<p>Lesson Essential Question(s): What do the graphs of absolute value and greatest integer look like? How are linear inequalities graphed? (A)</p>
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<p>Vocabulary: slope, intercept form</p>	<p>Vocabulary: best fit line, prediction equation</p>	<p>Vocabulary: variation</p>
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Additional information:

Attached Document(s):

Topic: Matrices

Days: 4

Subject(s):

Grade(s):

Key Learning:

The use of matrices for transformations and solving systems of equations.



Unit Essential Question(s):

How can matrices be used to solve algebraic problems?



<p>Concept: Matrix logic</p> <p><u>CC.2.2.HS.D.10</u></p>	<p>Concept: Creation of matrices</p> <p><u>CC.2.2.HS.D.10</u></p>	<p>Concept: Matrices and determinants</p> <p><u>CC.2.2.HS.D.10</u></p>
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<p>Lesson Essential Question(s): How are matrices used to solve logic problems? (A)</p>	<p>Lesson Essential Question(s): How are numerical matrices created and named? (A)</p>	<p>Lesson Essential Question(s): How is a 3x3 matrix evaluated? Can matrices be used to find the area of a triangle? (A)</p>
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<p>Vocabulary: matrix</p>	<p>Vocabulary: element, dimension</p>	<p>Vocabulary: determinant, expansion, minor</p>
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<p>Concept: Multiplication of a matrix</p> <p><u>CC.2.2.HS.D.10</u></p>	<p>Concept: Identify and inverse matrices</p> <p><u>CC.2.2.HS.D.10</u></p>	<p>Concept: Cramer's rule and use</p> <p><u>CC.2.2.HS.D.10</u></p>
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<p>Lesson Essential Question(s): How are matrices multiplied and the results interpreted? (A)</p>	<p>Lesson Essential Question(s): How are matrices identified and written? How does one find the inverse of a matrix? (A)</p>	<p>Lesson Essential Question(s): How is Cramer's rule used with matrices? How are augmented matrices used to solve a system of equations? (A)</p>
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<p>Vocabulary: matrix</p>	<p>Vocabulary: inverse matrix</p>	<p>Vocabulary: augmented matrix</p>
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Additional Information:

Attached Document(s):

Topic: Polynomials

Days: 7

Subject(s):

Grade(s):

Key Learning:

- Multiplication of monomials
- Factoring of polynomials
- Division of polynomials



Unit Essential Question(s):

What are polynomials and how are they used?



<p>Concept: Monomials</p> <p>CC.2.1.HSF.1, CC.2.2.HSD.3</p>	<p>Concept: Division of monomials</p> <p>CC.2.1.HSF.1, CC.2.2.HSD.3</p>	<p>Concept: Polynomials</p> <p>CC.2.1.HSF.1, CC.2.2.HSD.3</p>
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<p>Lesson Essential Question(s): How do I multiply and use power on monomials? What is scientific notation and how is it used? (A)</p>	<p>Lesson Essential Question(s): How are monomials divided? How is division done in scientific notation? (A)</p>	<p>Lesson Essential Question(s): What methods are used to add and/or subtract polynomials? How are polynomials multiplied? (A)</p>
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<p>Vocabulary: monomial, scientific notation</p>	<p>Vocabulary: monomial</p>	<p>Vocabulary: term, degree, binomial, trinomial</p>
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<p>Concept: factoring</p> <p>CC.2.2.HSD.4</p>	<p>Concept: Division of polynomials</p> <p>CC.2.2.HSD.4</p>
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<p>Lesson Essential Question(s): How are polynomials factored? (A)</p>	<p>Lesson Essential Question(s): How is factoring and division used in dividing polynomials? (A)</p>
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<p>Vocabulary: perfect square, difference of squares</p>	<p>Vocabulary: division</p>
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Additional Information:

Attached Document(s):

Topic: Probability

Days: 6

Subject(s):

Grade(s):

Key Learning:

An investigation of discrete mathematics and probability



Unit Essential Question(s):

What methods can be used to solve problems involving probability?



<p>Concept: The counting principle <u>CC.2.4.HS.B.6, CC.2.4.HS.B.7</u></p>	<p>Concept: Permutations <u>CC.2.4.HS.B.6, CC.2.4.HS.B.7</u></p>	<p>Concept: Combinations <u>CC.2.4.HS.B.6, CC.2.4.HS.B.7</u></p>
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<p>Lesson Essential Question(s): How is the fundamental counting principle used to solve problems? (A)</p>	<p>Lesson Essential Question(s): How are problems solved involving linear and circular permutations? (A)</p>	<p>Lesson Essential Question(s): How are combinations used to solve everyday problems? (A)</p>
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<p>Vocabulary: independent events, dependent events</p>	<p>Vocabulary: linear permutations, circular permutations</p>	<p>Vocabulary: combinations, $C(n,r)$</p>
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<p>Concept: Binomial experiments and simulations <u>CC.2.4.HS.B.6, CC.2.4.HS.B.7</u></p>	<p>Concept: Sampling and testing hypotheses <u>CC.2.4.HS.B.6, CC.2.4.HS.B.7</u></p>
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<p>Lesson Essential Question(s): How are binomial experiments used to solve probabilities? (A)</p>	<p>Lesson Essential Question(s): How is an unbiased sample determined? (A)</p>
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<p>Vocabulary: binomial, theoretical probability, simulation</p>	<p>Vocabulary: random, unbiased sample, error</p>
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Additional information:

Attached Document(s):

Topic: Quadratic Equations

Days: 6

Subject(s):

Grade(s):

Key Learning:

Solving quadratics by graphing, factoring, completing the square, and using the quadratic formula



Unit Essential Question(s):

What is a quadratic equation and how can it be solved?



<p>Concept: Solving quadratic equations</p> <p><u>CC.2.2.HSD.2</u>, <u>CC.2.2.HSD.4</u></p>	<p>Concept: Completing the square</p> <p><u>CC.2.2.HS.D.2</u>, <u>CC.2.2.HSD.4</u></p>	<p>Concept: Quadratic formula</p> <p><u>CC.2.2.HSD.2</u>, <u>CC.2.2.HSD.3</u></p>
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<p>Lesson Essential Question(s): How can graphing be used to solve quadratic equations? (A)</p>	<p>Lesson Essential Question(s): How can completing the square be used to solve quadratic equations? (A)</p>	<p>Lesson Essential Question(s): How can the quadratic form be used to solve equations? What is the discriminant? (A)</p>
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<p>Vocabulary: roots, solution, quadratic</p>	<p>Vocabulary: square roots</p>	<p>Vocabulary: quadratic formula, discriminant</p>
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Concept:
Sum and product of roots

CC.2.2.HSD.4



Lesson Essential Question(s):
How does one find the sum and product of roots? How are all roots found? (A)



Vocabulary:

Additional information:

Attached Document(s):

Topic: Quadratic Relations and Functions

Days: 6

Subject(s):

Grade(s):

Key Learning:
Solving quadratic functions



Unit Essential Question(s):
How are quadratic equations used to solve functions?



<p>Concept: Parabolas</p> <p>CC.2.2.HS.C.1</p>	<p>Concept: Graphing a quad function and analyzing it</p> <p>CC.2.2.HS.C.2</p> <p>CC.2.2.HS.D.7</p>	<p>Concept: Graphing quadratic inequalities</p> <p>CC.2.2.HS.C.2</p> <p>CC.2.2.HS.D.7</p>
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<p>Lesson Essential Question(s): How are functions written in quadratic form? What is used to identify the quadratic term, linear term, constant term? (A)</p>	<p>Lesson Essential Question(s): How do I graph the quadratic of the form: $y=(x-h) + K$? (A)</p>	<p>Lesson Essential Question(s): How are quadratic inequalities graphed? What does this graph look like? (A)</p>
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<p>Vocabulary: quadratic term, linear term, constant term</p>	<p>Vocabulary: Vertex, axis of symmetry</p>	<p>Vocabulary: boundary</p>
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Concept:
Solving quadratic inequalities

CC.2.2.HS.D.10



Lesson Essential Question(s):
How are quadratic function inequalities in one variable solved? (A)



Vocabulary:
Max value, boundary

Topic: Systems of Equations and Inequalities

Days: 9

Subject(s):

Grade(s):

Key Learning:
Solving systems of equations in two or three variables



Unit Essential Question(s):
What methods are used to solve systems of equations?

<p>Concept: Graphing systems</p> <p>CC.2.2.HSD.10</p>	<p>Concept: Solving systems algebraically</p> <p>CC.2.2.HSD.10</p>	<p>Concept: Cramer's Rule</p> <p>CC.2.2.HSD.10</p>
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<p>Lesson Essential Question(s): What is the first method used to graph systems? How is the calculator used for graphing? (A)</p>	<p>Lesson Essential Question(s): How are substitution and elimination used to solve systems of equations? (A)</p>	<p>Lesson Essential Question(s): How are equations using second order determinants solved? How is Cramer's Rule used? (A)</p>
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<p>Vocabulary: dependent solutions, independent solutions</p>	<p>Vocabulary: substitution, elimination</p>	<p>Vocabulary: Cramer's Rule, determinant</p>
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<p>Concept: Graphing systems of inequalities</p> <p>CC.2.2.HSD.10</p>	<p>Concept: Linear programming</p> <p>CC.2.2.HS.C.5</p>	<p>Concept: Graphing in three variables</p> <p>CC.2.2.HSD.10</p>
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<p>Lesson Essential Question(s): How can a graph be used to solve a system of inequalities? (A)</p>	<p>Lesson Essential Question(s): How are the Max and Min of a function found? How are these used to solve problems? (A)</p>	<p>Lesson Essential Question(s): What is an Octant and where is it located? How are equations in three variables solved? (A)</p>
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<p>Vocabulary: system, region</p>	<p>Vocabulary: feasible region, constraints</p>	<p>Vocabulary: ordered triple, octant</p>
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Topic: Trigonometric Functions

Days: 12

Subject(s):

Grade(s):

Key Learning:

Trigonometric functions and their relationships to the real world.



Unit Essential Question(s):

How is the value of a trig function that is used in problems and some triangles found using sine and cosine?



<p>Concept: Angles and the unit circle</p> <p>CC.2.2.HS.C.7</p>	<p>Concept: Sine and cosine functions</p> <p>CC.2.2.HS.C.7</p> <p>CC.2.2.HS.C.9</p>	<p>Concept: Functions: Sec, Csc, tan, and cot</p> <p>CC.2.2.HS.C.7</p> <p>CC.2.2.HS.C.9</p>
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<p>Lesson Essential Question(s): How is median measure changed to degree measure? What are coterminal angles? (A)</p>	<p>Lesson Essential Question(s): How is the least possible angle found that is coterminal to a given angle? How are sine and cosine used? (A)</p>	<p>Lesson Essential Question(s): What other trig. functions can be used to solve problems? (A)</p>
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<p>Vocabulary: initial side, terminal side, position, coterminal</p>	<p>Vocabulary: sine functions, cosine functions</p>	<p>Vocabulary: sec, csc, tan, cot</p>
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Topic: Trigonometric Functions

Days: 12

Subject(s):

Grade(s):

<p>Concept: Inverse trig functions</p> <p>CC.2.2.HS.C.8</p>	<p>Concept: Finding values using a calculator</p> <p>CC.2.2.HS.C.8</p>	<p>Concept: Using right triangles to solve trig problems</p> <p>CC.2.2.HS.C.8</p>
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<p>Lesson Essential Question(s): How is the value of an expression found using trigonometric functions? (A)</p>	<p>Lesson Essential Question(s): What methods are used to find values using a calculator? (A)</p>	<p>Lesson Essential Question(s): How are trigonometric and right triangles used to solve problems? (A)</p>
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<p>Vocabulary: inverse function, arccos, arcsin, arctan</p>	<p>Vocabulary: degree, minute, seconds</p>	<p>Vocabulary: hypotenuse, opposite side, adjacent side</p>
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<p>Concept: Applications of right triangles</p> <p>CC.2.2.HS.C.8</p>	<p>Concept: Law of sines</p> <p>CC.2.2.HS.C.8</p>	<p>Concept: Law of cosines</p> <p>CC.2.2.HS.C.8</p>
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<p>Lesson Essential Question(s): How are right triangles and trig used to solve everyday problems? (A)</p>	<p>Lesson Essential Question(s): How is the law of sines used to solve problems? (A)</p>	<p>Lesson Essential Question(s): How is the law of cosines used to solve problems? (A)</p>
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<p>Vocabulary: angle of elevation, angle of depression</p>	<p>Vocabulary: law of sines</p>	<p>Vocabulary: law of cosines</p>
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Additional Information:

Attached Document(s):

Topic: Trigonometric Identities

Days: 12

Subject(s):

Grade(s):

Key Learning:
 Drawing graphs of trig functions
 Using graphs to solve trig problems
 Using identities to solve trig problems



Unit Essential Question(s):
 How can trig identities be used to solve problems?



<p>Concept: Graphing trig functions</p> <p>CC.2.2.HS.C.2 CC.2.2.HS.C.8</p>	<p>Concept: Graph trig functions Change trig graphs</p> <p>CC.2.2.HS.C.2 CC.2.2.HS.C.8</p>	<p>Concept: Trig identities</p> <p>CC.2.2.HS.C.8</p>
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<p>Lesson Essential Question(s): What do the graphs look like? How can I graph using the calculator? (A)</p>	<p>Lesson Essential Question(s): How can ω change the period, and amplitude of a trig function graph? (A)</p>	<p>Lesson Essential Question(s): How can trig identities be used to simplify and evaluate expressions? (A)</p>
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<p>Vocabulary: period, amplitude</p>	<p>Vocabulary: absolute value</p>	<p>Vocabulary: identity</p>
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Topic: Trigonometric Identities

Days: 12

Subject(s):

Grade(s):

Concept: Verifying identities CC.2.2.HS.C.8	Concept: Sum and difference of angle formulas CC.2.2.HS.C.8	Concept: Double and half angle formulas CC.2.2.HS.C.8
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Lesson Essential Question(s): What methods can be used to verify trig identities? (A)	Lesson Essential Question(s): How are values for sine and cosine found using sum and difference formulas? (A)	Lesson Essential Question(s): How are half and double angles used to find values of sine and cosine identities? (A)
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Vocabulary: identities	Vocabulary: verify, sum, difference	Vocabulary: double and half
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Concept: Solving trig equations CC.2.2.HS.C.8	Concept: Trig notation and complex numbers CC.2.2.C.8
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Lesson Essential Question(s): How are trig identities used to solve equations? (A)	Lesson Essential Question(s): How are complex numbers used in polar form? How are numbers converted to rectangular and polar form? (A)
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Vocabulary:	Vocabulary:
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Additional Information:

Attached Document(s):