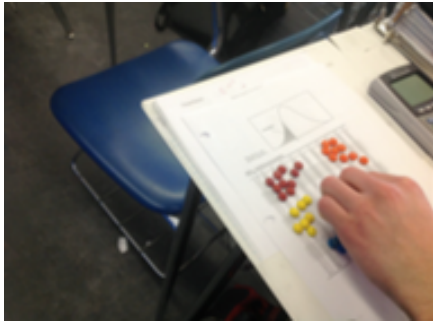
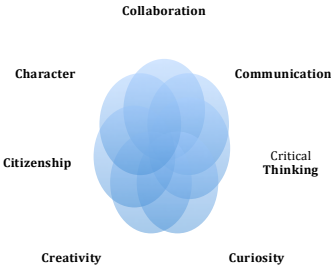


Content Area: Mathematics	Course: Functions, Statistics, and Trigonometry	Grade Level: 11
	R14 The Seven Cs of Learning 	
Unit Titles		Length of Unit
<ul style="list-style-type: none"> • Linear Functions and Systems of Linear Functions 		4-6 weeks
<ul style="list-style-type: none"> • Quadratic Functions 		8-12 weeks
<ul style="list-style-type: none"> • Exponential and Logarithmic Functions 		7-9 weeks
<ul style="list-style-type: none"> • Inferential Statistics 		4-6 weeks
<ul style="list-style-type: none"> • Right Triangle Trigonometry and Trigonometric Functions 		5-7 weeks
<ul style="list-style-type: none"> • Radical and Rational Functions 		3-5 weeks



Strands	Course Level Expectations
High School: Algebra	<ul style="list-style-type: none"> • Interpret the structure of expressions. • Perform arithmetic operations on polynomials. • Understand the relationship between zeros and factors of polynomials. • Create equations that describe numbers or relationships. • Understand solving equations as a process of reasoning and explain the reasoning. • Represent and solve equations and inequalities graphically.
High School: Functions	<ul style="list-style-type: none"> • Construct and compare linear, quadratic, and exponential models and solve problems. • Interpret expressions for functions in terms of the situation they model. • Analyze functions using different representations. • Build a function that models a relationship between two quantities. • Understand the inverse relationship between exponents and logarithms and use this relationship to solve problems involving logarithms and exponents.

Strands	Course Level Expectations
High School: Geometry	<ul style="list-style-type: none"> • Define trigonometric ratios and solve problems involving right triangles • Translate between the geometric description and the equation for a conic section
High School: Statistics & Probability	<ul style="list-style-type: none"> • Summarize, represent, and interpret data on a single count or measurement variable • Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers). • Understand and evaluate random processes underlying statistical experiments • Make inferences and justify conclusions from sample surveys, experiments, and observational studies

Unit Title	Linear Functions and Systems of Linear Functions	Length of Unit	4-6 weeks
Inquiry Questions (Engaging & Debatable)	<ul style="list-style-type: none"> • What does it mean to be a solution? • In what various ways can we represent a linear relationship? • What effect do the slope and the y-intercept have on the graph of a linear function? 		
Standards	<p>Creating Equations: CCSS.MATH.CONTENT.HSA.CED.A.1, CCSS.MATH.CONTENT.HSA.CED.A.2, CCSS.MATH.CONTENT.HSA.CED.A.3, CCSS.MATH.CONTENT.HSA.CED.A.4,</p> <p>Reasoning with Equations & Inequalities: CCSS.MATH.CONTENT.HSA.REI.A.1, CCSS.MATH.CONTENT.HSA.REI.B.3, CCSS.MATH.CONTENT.HSA.REI.C.6, CCSS.MATH.CONTENT.HSA.REI.D.10</p> <p>Linear, Quadratic, & Exponential Models: CCSS.MATH.CONTENT.HSF.LE.A.1.B, CCSS.MATH.CONTENT.HSF.LE.A.2, CCSS.MATH.CONTENT.HSF.LE.B.5,</p> <p>Interpreting Functions: CCSS.MATH.CONTENT.HSF.IF.B.4, CCSS.MATH.CONTENT.HSF.IF.B.6, CCSS.MATH.CONTENT.HSF.IF.C.7.A</p>		
Unit Strands & Concepts	<ul style="list-style-type: none"> • Solving linear equations • Graphing linear functions • Writing equations of linear functions • Solving systems of linear functions 		
Key Vocabulary	Equation, Inverse Operations, Slope, Y-intercept, Initial Value, Rate of Change, System of equations, Elimination method		

Unit Title	Linear Functions and Systems of Linear Functions	Length of Unit	4-6 weeks
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Critical Content: My students will Know ...	Key Skills: My students will be able to (Do) ...
<ul style="list-style-type: none"> • Equations are solved by using inverse operations. • How to identify the slope and y-intercept of a linear function from a graph, from an equation, and from a situation. • The equation of a linear function can be determined by two parameters, the slope and the y-intercept. • The solution of a system of two linear functions is the ordered pair(s) which is a solution to both equations. 	<ul style="list-style-type: none"> • Solve a linear equation. • Graph a linear function using slope and y-intercept. • Write an equation of a linear function from a graph, from a real world situation, etc. • Solve a system of two linear functions using the elimination method.

Assessments:	Formative Assessments Performance Based Assessment
Teacher Resources:	Implementation Guide (CT Core Standards released materials.) Graphing Calculators

Unit Title	Quadratic Functions	Length of Unit	8-12 weeks
Inquiry Questions (Engaging & Debatable)	<ul style="list-style-type: none"> • How is a Linear Function similar to and different from a Quadratic Function? • What are the advantages/disadvantages to graphing from Standard Form versus graphing from Factored Form? • What are the advantages/disadvantages to solving by factoring versus solving using the Quadratic Formula? • Why do Quadratic Equations have only 0, 1, or 2 real solutions? 		
Unit Strands & Standards	<p>Seeing Structure in Expressions: CCSS.MATH.CONTENT.HSA.SSE.A.2 CCSS.MATH.CONTENT.HSA.APR.B.3</p> <p>Reasoning with Equations & Inequalities: CCSS.MATH.CONTENT.HSA.REI.B.4.B CCSS.MATH.CONTENT.HSA.REI.D.10</p> <p>Interpreting Functions: CCSS.MATH.CONTENT.HSF.IF.B.4, CCSS.MATH.CONTENT.HSF.IF.C.7.A, CCSS.MATH.CONTENT.HSF.IF.C.8.A</p>		
Concepts	<ul style="list-style-type: none"> • Linear versus Quadratic Functions • Graphing from Standard Form • Factoring a quadratic into binomials ($a = 1$, and $a \neq 1$ but $a = \text{GCF}$) • Solving a Quadratic Equation in Factored Form • Graphing from Factored Form • Solving a Quadratic Equation with the Quadratic Formula 		
Key Vocabulary	Quadratic Function, Standard Form, Vertex, Factored Form, X-intercept, Zeros, Factoring, Greatest Common Factor(GCF), Binomial, Trinomial, Quadratic Formula		

Unit Title	Quadratic Functions	Length of Unit	8-12 weeks
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Critical Content: My students will Know ...	Key Skills: My students will be able to (Do) ...
<ul style="list-style-type: none"> • The difference between a Linear Function and a Quadratic Function. • The solutions of a Quadratic Equations set equal to 0 are the same as the x-intercepts of the corresponding graph. • The Quadratic Formula can be used to find the solutions of any Quadratic Equation. • A Quadratic Equation has 0, 1, or 2 real solutions. 	<ul style="list-style-type: none"> • Graph a Quadratic Function in Standard or Factored Form. • Factor a Quadratic (including using the GCF). • Solve a Quadratic Equation by factoring. • Solve a Quadratic Equation using the Quadratic Formula.

Assessments:	Formative and Summative Assessment 1 performance based assessment
Teacher Resources:	Teacher created documents including, but not limited to, CT Core Standards released Algebra 2 materials. Graphing Calculators

Unit Title	Exponential and Logarithmic Functions	Length of Unit	7-9 weeks
Inquiry Questions (Engaging & Debatable)	<ul style="list-style-type: none"> • How is an exponential function similar or different compared to a linear or a quadratic function? • What does it mean for 2 functions to be inverses? • How are logarithms used to solve exponential equations and vice versa? • What are some real world problems that can be solved using exponential and logarithmic functions? 		
Standards	<p>Creating Equations: CCSS.MATH.CONTENT.HSA.CED.A.1, CCSS.MATH.CONTENT.HSA.CED.A.2</p> <p>Interpreting Functions: CCSS.MATH.CONTENT.HSF.IF.B.4, CCSS.MATH.CONTENT.HSF.IF.C.7.E</p> <p>Building Functions: CCSS.MATH.CONTENT.HSF.BF.A.1 CCSS.MATH.CONTENT.HSF.BF.B.5</p> <p>Linear, Quadratic, & Exponential Models: CCSS.MATH.CONTENT.HSF.LE.A.1.A, CCSS.MATH.CONTENT.HSF.LE.A.1.C, CCSS.MATH.CONTENT.HSF.LE.A.2, CCSS.MATH.CONTENT.HSF.LE.A.3, CCSS.MATH.CONTENT.HSF.LE.A.4, CCSS.MATH.CONTENT.HSF.LE.B.5</p>		
Unit Strands & Concepts	<p>Exponent Properties and Linear vs. Exponential Functions</p> <p>Writing equation of an Exponential Function from a graph, from parameters, and from a real world situation, Logarithm as Inverse of an Exponential</p> <p>The Natural Base, Solving Exponential and Logarithmic Equations and Compound Interest</p>		
Key Vocabulary	<p>Exponential Function, Base of an Exponential, Exponent, Initial Value, Growth/Decay Factor, Logarithm, Inverse, Base of a Logarithm, e, ln, compound interest, compounded continuously</p>		

Unit Title	Exponential and Logarithmic Functions	Length of Unit	7-9 weeks
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Critical Content: My students will Know ...	Key Skills: My students will be able to (Do) ...
<ul style="list-style-type: none"> • The differences between linear and exponential functions. • The inverse relationship between exponential functions and logarithmic functions. • e is the natural base and is used for compounding continuously. 	<ul style="list-style-type: none"> • Simplify an expression using exponent properties. • Graph an exponential function. • Write an equation of an exponential function from a graph, from parameters, or from a real world situation. • Solve an exponential or a logarithmic equation by converting between forms, including real world problems.

Assessments:	<ul style="list-style-type: none"> • Formative and Summative Assessments • 1 performance based assessment
Teacher Resources:	<ul style="list-style-type: none"> • Implementation Guide • Graphing Calculators

Unit Title	Inferential Statistics	Length of Unit	4-6 weeks
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Inquiry Questions (Engaging & Debatable)	<ul style="list-style-type: none"> • How do we describe data? • Why are samples necessary? • How can we use a sample to make conclusions about an entire population?
Unit Strands & Standards	<p>Interpreting Categorical & Quantitative Data CCSS.MATH.CONTENT.HSS.ID.A.2, CCSS.MATH.CONTENT.HSS.ID.A.3</p> <p>Making Inferences & Justifying Conclusions CCSS.MATH.CONTENT.HSS.IC.A.1, CCSS.MATH.CONTENT.HSS.IC.A.2, CCSS.MATH.CONTENT.HSS.IC.B.4, CCSS.MATH.CONTENT.HSS.IC.B.6</p>
Concepts	<ul style="list-style-type: none"> • Measures of Center, Spread, and Shape • Population and Sample • Introduction to Inference
Key Vocabulary	Mean, Median, Mode, Range, Standard Deviation, Skewed Left, Skewed Right, Symmetric, Normal Curve, Uniform, Bimodal, Population, Sample, Representative, Confidence Interval, Margin of Error, Hypothesis Test, Statistically Significant

Unit Title	Inferential Statistics	Length of Unit	4-6 weeks
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Critical Content: My students will Know ...	Key Skills: My students will be able to (Do) ...
<ul style="list-style-type: none"> • Why we use multiple measures of center and spread. • The relationship between the shape and the measures of center. • What constitutes a representative sample of the population. • Why we must use inferential procedures to make conclusions about a population. 	<ul style="list-style-type: none"> • Calculate measures of center and spread. • Describe the shape of a distribution. • Distinguish between population and sample. • Determine the plausibility of a value based on a confidence interval. • Determine if a value is statistically significant based on a hypothesis test.

Assessments:	<ul style="list-style-type: none"> • Formative and Summative Assessments • 1 performance based assessment
Teacher Resources:	<p>Implementation Guide Graphing Calculators (including probability simulator)</p>

Unit Title	Right Triangle Trigonometry and Trigonometric Functions	Length of Unit	5-7 weeks
Inquiry Questions (Engaging & Debatable)	<ul style="list-style-type: none"> • How are the sides and angles of a right triangle related? • What types of real world situations can be modeled using right triangles? • How is the equation of a circle different from that of the functions studied in this course? 		
Standards	<p>Similarity, Right Triangles & Trigonometry: CCSS.MATH.CONTENT.HSG.SRT.C.6, CCSS.MATH.CONTENT.HSG.SRT.C.7 CCSS.MATH.CONTENT.HSG.SRT.C.8</p> <p>Geometric Properties with Equations: CCSS.MATH.CONTENT.HSG.GPE.A.1</p>		
Unit Strands & Concepts	<ul style="list-style-type: none"> • Pythagorean Theorem • Trigonometric Ratios (Sine, Cosine, Tangent) • Solving a Right Triangle, including applications • Equation of a Circle 		
Key Vocabulary	Legs, Hypotenuse, Pythagorean Theorem, Sine, Cosine, Tangent, Center of a Circle, Radius		

Unit Title	Right Triangle Trigonometry and Trigonometric Functions	Length of Unit	5-7 weeks
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Critical Content: My students will Know ...	Key Skills: My students will be able to (Do) ...
<ul style="list-style-type: none"> • Which sides of a right triangle are legs and which is the hypotenuse. • When to use Pythagorean Theorem as opposed to Trigonometry to solve a right triangle. • The difference between the sine, cosine, and tangent ratios. • The form of the equation of a circle. 	<ul style="list-style-type: none"> • Solve Right Triangles using Pythagorean Theorem. • Solve Right Triangles using Trigonometry. • Write the Equation of a Circle given its center and radius . • Find the length of the radius of a circle using the Pythagorean Theorem.

Assessments:	<ul style="list-style-type: none"> • Formative Assessments • Unit test/performance based assessment
Teacher Resources:	<p>Implementation Guide Graphing Calculators</p>

Unit Title	Radical and Rational Functions	Length of Unit	3-5 weeks
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Inquiry Questions (Engaging & Debatable)	<ul style="list-style-type: none"> • How are inverse functions used to solve radical equations? • What is the relationship between direct variation (linear functions) and inverse variation (rational functions)? • How does the denominator affect the graph of a rational function?
Standards	<p>Creating Equations: CCSS.MATH.CONTENT.HSA.CED.A.2</p> <p>Reasoning with Equations & Inequalities: CCSS.MATH.CONTENT.HSA.REI.A.2</p> <p>Interpreting Functions: CCSS.MATH.CONTENT.HSF.IF.B.4, CCSS.MATH.CONTENT.HSF.IF.C.7.D</p>
Unit Strands & Concepts	<ul style="list-style-type: none"> • Solving a Radical Equation • Solving Real World Direct Variation Problems • Solving Real World Inverse Variation Problems • Graphs of Rational Functions
Key Vocabulary	Radical, index of radical, direct variation, inverse variation, coefficient of variation, asymptote, hyperbola

Unit Title	Radical and Rational Functions	Length of Unit	3-5 weeks
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Critical Content: My students will Know ...	Key Skills: My students will be able to (Do) ...
<ul style="list-style-type: none"> The relationship between the index of a radical equation and the power of a corresponding power function. The difference between direct and inverse variation. The general shape of the graph of a rational function. 	<ul style="list-style-type: none"> Solve a radical equation by raising both sides of the equation to the same power. Solve real world problems involving direct and inverse variation. Graph a rational function by finding asymptotes and intercepts.

Assessments:	<ul style="list-style-type: none"> Formative Assessments Unit test/performance based assessment
Teacher Resources:	<p>Implementation Guide Graphing Calculators</p>