

HILLSBOROUGH TOWNSHIP SCHOOL DISTRICT

MATHEMATICS CURRICULUM

Algebra III and Trigonometry

July, 2020

Course Overview

This fourth year math course is recommended for the student who completed Algebra II CP but requires reinforcement in Number Sense and Algebra as well as an introduction to trigonometric functions before proceeding on to Math Analysis.

The objective of this course is to strengthen the student's algebra skills and further develop the student's graphing skills. The course begins with a review of the fundamental concepts of Algebra, including but not limited to, real numbers, exponents, radicals, linear functions, complex numbers, and factoring. This is followed by topics that include: equations and inequalities; polynomial and rational functions and their graphs; exponential and logarithmic functions, inverse functions, and the graphing of these functions; matrices and systems of equations; vectors and an introduction to trigonometry. The course is aligned to the New Jersey Student Learning Standards,

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Unit Title: Unit 1 Linear Functions	Timeframe/Pacing: 26 days
Essential Questions <ul style="list-style-type: none"> ● How can change be best represented mathematically? ● How are patterns of change related to the behavior of functions? 	
Enduring Understandings <ul style="list-style-type: none"> ● Algebraic representation can be used to generalize patterns and relationships. ● Patterns and relationships can be represented graphically, numerically, symbolically, or verbally. 	
Standards Taught and Assessed <ul style="list-style-type: none"> ● A-CED.A.4: Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. ● A-CED.A.1: Create equations and inequalities in one variable and use them to solve problems. ● A-REI.B.3: Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters. ● F-IF.C.7.a: Graph linear and quadratic functions and show intercepts, maxima, and minima. ● F-IF.C.8: Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function. ● S-ID.C.7: Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data ● A-REI.D.12: Graph the solutions to a linear inequality in two variables as a half-plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes. ● F-IF.A.1: Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If f is a function and x is an element of its domain, then $f(x)$ denotes the output of f corresponding to the input x. The graph of f is the graph of the equation $y = f(x)$. 	
Highlighted Interdisciplinary Connections <ul style="list-style-type: none"> ● Computer Science & Design Thinking: 8.1.12.DA.5: Create data visualizations from large data sets to summarize, communicate, and support different interpretations of real-world phenomena. 	
Highlighted Career Ready Practices and 21st Century Themes and Skill <ul style="list-style-type: none"> ● 9.4.12.IML.3: Analyze data using tools and models to make valid and reliable claims, or to determine optimal design solutions 	
Social Emotional Learning Competencies	

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<ul style="list-style-type: none"> 2.1.12.EH.1: Recognize one's personal traits, strengths, and limitations and identify how to develop skills to support a healthy lifestyle. 				
Pre-Assessment <ul style="list-style-type: none"> A-REI.B.3 F-IF.C.7a 		Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504) <ul style="list-style-type: none"> Extra time, reword/repeat/clarify directions and questions, and other specific accommodations/modifications per a student's IEP or 504 plan 		
Student Learning Objectives: We are learning to/that...	Student Strategies (Mathematical Practices)	Formative Assessment	Activities and Resources	Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)
A-REI.B.3: Solve linear equations in one variable	SMP 2 Reason abstractly and quantitatively.	$6x+6(2x-5)=-10-2x$	Discussion with examples, small group work with scaled exercises	Peer support, challenge work, individual instruction, and other accommodations/modifications as outlined in IEP/504 plan
A.CED.A.4: Rearrange formulas to highlight a quantity of interest	SMP 6 Attend to precision	Solve $A=1/2 h(b+B)$ for b	Teacher prepared guided notes	Peer support, challenge work, individual instruction, and other accommodations/modifications as outlined in IEP/504 plan
A-CED.A.1: Create equations in one variable and use them to solve problems.	SMP 4 Model with mathematics.	A rectangular carpet has a total perimeter of 138 inches. The length of the carpet is 15 more than twice the width. What is the length of the carpet?	Discussion with examples, small group work with scaled exercises	Peer support, challenge work, individual instruction, and other accommodations/modifications as outlined in IEP/504 plan
A-REI.B.3: Solve linear inequalities in one variable	SMP 1 Make sense of problems and persevere in solving	$12x + 1 \leq 11x - 4$ $3x - 2 \leq 13$ or $x + 5 \leq 7$	Discussion with examples, small group work with scaled exercises	Peer support, challenge work, individual instruction, and other accommodations/modifications

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	them.	$ 2r+3 < 15$		as outlined in IEP/504 plan
F-IF.C.7.a: Graph linear functions and show intercepts	SMP 6 Attend to precision	For the line $2x + 3y = 12$, identify the x- and y-intercepts, slope, and graph the line.	Desmos Graphing	Peer support, challenge work, individual instruction, and other accommodations/modifications as outlined in IEP/504 plan
S-ID.C.7: Interpret the slope (rate of change) ... of a linear model in the context of the data	SMP 2 Reason abstractly and quantitatively.	A telethon raised \$629,500 in 2006, and \$805,900 in 2008. Find the average rate of change in dollars per year.	Discussion with examples, small group work with scaled exercises	Peer support, challenge work, individual instruction, and other accommodations/modifications as outlined in IEP/504 plan
F-IF.C.8: Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function.	SM P2 Reason abstractly and quantitatively.	Write the equation of a line through (9, 8), parallel to $x - 2y = 10$ in standard form.	Discussion with examples, small group work with scaled exercises	Peer support, challenge work, individual instruction, and other accommodations/modifications as outlined in IEP/504 plan
A-REI.D.12: Graph the solutions to a linear inequality in two variables	SMP 2 Reason abstractly and quantitatively.	Graph $3x + 4y \leq 12$ and $2x > y$	Discussion with examples, small group work with scaled exercises	Peer support, challenge work, individual instruction, and other accommodations/modifications as outlined in IEP/504 plan
F-IF.A.1: Understand that a function from one set (called the domain) to another set (called the range) assigns to each	MP1 Make sense of problems and persevere in solving them.	Determine if the following are relations or functions. $\{(2,1), (6,4), (-2,1), (6,2), (2,3)\}$	Matching Activity	Peer support, challenge work, individual instruction, and other accommodations/modifications as outlined in IEP/504 plan

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element of the domain exactly one element of the range		$y = \sqrt{(3x - 4)}$	
Benchmark Assessment <ul style="list-style-type: none"> ● N/A 		Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504) <ul style="list-style-type: none"> ● Extra time, reword/repeat/clarify directions and questions, and other specific accommodations/modifications per a student's IEP or 504 plan 	
Summative Assessment(s) <ul style="list-style-type: none"> ● Unit 1 Common Assessment 1 <ul style="list-style-type: none"> ○ A-REI.B.3 ○ A.CED.A.4 ○ A-CED.A.1 ● Unit 1 Common Assessment 2 <ul style="list-style-type: none"> ○ A-REI.B.3 ● Unit 1 Common Assessment 3 <ul style="list-style-type: none"> ○ F-IF.C.7.a ○ S-ID.C.7 ○ F-IF.C.8 ● Unit 1 Common Assessment 4 <ul style="list-style-type: none"> ○ A-REI.D.12 ○ F-IF.A.1 ● Unit 1 Performance Task 		Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504) <ul style="list-style-type: none"> ● Extra time, reword/repeat/clarify directions and questions, and other specific accommodations/modifications per a student's IEP or 504 plan 	

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Unit Title: Unit 2 Systems and Matrices	Timeframe/Pacing: 15 days
Essential Questions <ul style="list-style-type: none"> ● How can change be best represented mathematically? ● How are patterns of change related to the behavior of functions? 	
Enduring Understandings <ul style="list-style-type: none"> ● Algebraic representation can be used to generalize patterns and relationships. ● Patterns and relationships can be represented graphically, numerically, symbolically, or verbally. 	
Standards Taught and Assessed <ul style="list-style-type: none"> ● A-REI.C.5: Prove that, given a system of two equations in two variables, replacing one equation by the sum of that equation and a multiple of the other produces a system with the same solutions. ● A-REI.D.11: Explain why the x-coordinates of the points where the graphs of the equations $y = f(x)$ and $y = g(x)$ intersect are the solutions of the equation $f(x) = g(x)$; find the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where $f(x)$ and/or $g(x)$ are linear, polynomial, rational, absolute value, exponential, and logarithmic functions. ● N-VM.C.7: (+) Multiply matrices by scalars to produce new matrices, e.g., as when all of the payoffs in a game are doubled. ● N-VM.C.8: (+) Add, subtract, and multiply matrices of appropriate dimensions. ● A-REI.C.8: (+) Represent a system of linear equations as a single matrix equation in a vector variable 	
Highlighted Interdisciplinary Connections <ul style="list-style-type: none"> ● ELA: SL.9-10.4. Present information, findings, and supporting evidence clearly, concisely, and logically. The content, organization, development, and style are appropriate to task, purpose, and audience. 	
Highlighted Career Ready Practices and 21st Century Themes and Skill <ul style="list-style-type: none"> ● 9.4.12.CI.1: Demonstrate the ability to reflect, analyze, and use creative skills and ideas 	
Social Emotional Learning Competencies <ul style="list-style-type: none"> ● 2.1.12.EH.1: Recognize one's personal traits, strengths, and limitations and identify how to develop skills to support a healthy lifestyle. 	
Pre-Assessment <ul style="list-style-type: none"> ● A-REI.C.5 	Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)

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<ul style="list-style-type: none"> A-REI-D.11 		<ul style="list-style-type: none"> Extra time, reword/repeat/clarify directions and questions, and other specific accommodations/modifications per a student's IEP or 504 plan 		
Student Learning Objectives: We are learning to/that...	Student Strategies (Mathematical Practices)	Formative Assessment	Activities and Resources	Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)
A-REI.C.5: given a system of two equations in two variables, replacing one equation by the sum of that equation and a multiple of the other produces a system with the same solutions	SMP 7 Look for and make use of structure.	Solve: $2x+3y=-6$ $4x-3y=6$ Solve: $6x-12y=-5$ $8y+z=0$ $9x-z=12$	Discussion with examples, small group work with scaled exercises	Peer support, challenge work, individual instruction, and other accommodations/modifications as outlined in IEP/504 plan
A-REI.D.11: Explain why .. the graphs of the equations $y = f(x)$ and $y = g(x)$ intersect are the solutions of the equation $f(x) = g(x)$; find the solutions approximately	SMP 6 Attend to precision	Solve by graphing: $x+y=5$ $2x-y=4$	Discussion with examples, small group work with scaled exercises	Peer support, challenge work, individual instruction, and other accommodations/modifications as outlined in IEP/504 plan
A-REI.C.8: (+) Represent a system of linear equations as a single matrix equation	SMP 7 Look for and make use of structure.	Use row operations to solve: $x-3y=1$ $2x+y=-5$	Discussion with examples, small group work with scaled exercises	Peer support, challenge work, individual instruction, and other accommodations/modifications as outlined in IEP/504 plan
N-VM.C.7: (+) Multiply matrices by scalars	SMP 2 Reason abstractly and	Multiply:	Discussion with examples, small group work with	Peer support, challenge work, individual

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	quantitatively.	$2 \begin{bmatrix} 5 & -2 \\ 0 & 7 \end{bmatrix}$	scaled exercises	instruction, and other accommodations/modifications as outlined in IEP/504 plan
N-VM.C.8: (+) Add, subtract...matrices	SMP 2 Reason abstractly and quantitatively.	Add: $\begin{bmatrix} 5 & -6 \\ 8 & 9 \end{bmatrix} + \begin{bmatrix} -4 & 6 \\ 8 & -3 \end{bmatrix}$	Discussion with examples, small group work with scaled exercises	Peer support, challenge work, individual instruction, and other accommodations/modifications as outlined in IEP/504 plan
N-VM.C.8: (+) multiply matrices	SMP 1 Make sense of problems and persevere in solving them.	Multiply: $\begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix} \begin{bmatrix} -1 \\ 7 \end{bmatrix}$	Discussion with examples, small group work with scaled exercises	Peer support, challenge work, individual instruction, and other accommodations/modifications as outlined in IEP/504 plan
Benchmark Assessment <ul style="list-style-type: none"> ● Quarterly 1 		Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504) <ul style="list-style-type: none"> ● Extra time, reword/repeat/clarify directions and questions, and other specific accommodations/modifications per a student's IEP or 504 plan 		
Summative Assessment(s) <ul style="list-style-type: none"> ● Unit 2 Common Assessment 1 <ul style="list-style-type: none"> ○ A-REI.C.5 ○ A-REI.D.11 ● Unit 2 Common Assessment 2 <ul style="list-style-type: none"> ○ A-REI.C.8 ○ N-VM.C.7 ○ N-VM.C.8 ● Unit 2 Performance Task 		Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504) <ul style="list-style-type: none"> ● Extra time, reword/repeat/clarify directions and questions, and other specific accommodations/modifications per a student's IEP or 504 plan 		

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Unit Title: Unit 3 Polynomials	Timeframe/Pacing: 13 days
Essential Questions <ul style="list-style-type: none"> ● How do mathematical ideas interconnect and build on one another to produce a coherent whole? 	
Enduring Understandings <ul style="list-style-type: none"> ● The properties of integers apply to polynomial expressions. 	
Standards Taught and Assessed <ul style="list-style-type: none"> ● A-APR.A.1: Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials. ● A-APR.D.6: Rewrite simple rational expressions in different forms; write $a(x)/b(x)$ in the form $q(x) + r(x)/b(x)$, where $a(x)$, $b(x)$, $q(x)$, and $r(x)$ are polynomials with the degree of $r(x)$ less than the degree of $b(x)$, using inspection, long division, or, for the more complicated examples, a computer algebra system. ● F-IF.C.8.b: Use the properties of exponents to interpret expressions for exponential functions. 	
Highlighted Interdisciplinary Connections <ul style="list-style-type: none"> ● ELA: L.11-12.4. Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grades 11–12 reading and content, choosing flexibly from a range of strategies 	
Highlighted Career Ready Practices and 21st Century Themes and Skill <ul style="list-style-type: none"> ● 9.4.12.CI.1: Demonstrate the ability to reflect, analyze, and use creative skills and ideas 	
Social Emotional Learning Competencies <ul style="list-style-type: none"> ● 2.1.12.EH.1: Recognize one’s personal traits, strengths, and limitations and identify how to develop skills to support a healthy lifestyle. 	
Pre-Assessment <ul style="list-style-type: none"> ● A-APR.A.1 ● F-IF.C.8.b 	Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504) <ul style="list-style-type: none"> ● Extra time, reword/repeat/clarify directions and questions, and other specific accommodations/modifications per a student’s IEP or 504 plan

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Student Learning Objectives: We are learning to/that...	Student Strategies (Mathematical Practices)	Formative Assessment	Activities and Resources	Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)
F-IF.C.8.b: Use the properties of exponents	SMP 2 Reason abstractly and quantitatively.	Simplify $y^2 y^8 y^3$	Discussion with examples, small group work with scaled exercises	Peer support, challenge work, individual instruction, and other accommodations/modifications as outlined in IEP/504 plan
A-APR.A.1: Add and subtract polynomials.	SMP 6 Attend to precision	For the functions $f(x) = 3x - 4$, $g(x) = -9x + 9$, find $(f + g)(x)$ and $(f - g)(x)$.	Discussion with examples, small group work with scaled exercises	Peer support, challenge work, individual instruction, and other accommodations/modifications as outlined in IEP/504 plan
A-APR.A.1: Multiply polynomials.	MP6 Attend to precision	For the functions $f(x) = 4x$, $g(x) = 8x - 2$, find the product $f(x) g(x)$.	Discussion with examples, small group work with scaled exercises	Peer support, challenge work, individual instruction, and other accommodations/modifications as outlined in IEP/504 plan
A-APR.D.6: Write $a(x)/b(x)$ in the form $q(x) + r(x)/b(x)$, where $a(x)$, $b(x)$, $q(x)$, and $r(x)$ are polynomials with the degree of $r(x)$ less than the degree of $b(x)$, using long division	SMP 1 Make sense of problems and persevere in solving them.	For the function $f(x) = x^2 + 9x + 20$ and $g(x) = x + 5$, find $f(x) / g(x)$.	Discussion with examples, small group work with scaled exercises	Peer support, challenge work, individual instruction, and other accommodations/modifications as outlined in IEP/504 plan

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<p>A-APR.A.1: Understand that polynomials form a system analogous to the integers</p>	<p>SMP 1 Make sense of problems and persevere in solving them.</p>	<p>For the function $f(x) = 2x + 6$ and $g(x) = x^2 - 7$, find $f(g(x))$.</p>	<p>Discussion with examples, small group work with scaled exercises</p>	<p>Peer support, challenge work, individual instruction, and other accommodations/modifications as outlined in IEP/504 plan</p>
<p>Benchmark Assessment</p> <ul style="list-style-type: none"> • N/A 		<p>Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)</p> <ul style="list-style-type: none"> • Extra time, reword/repeat/clarify directions and questions, and other specific accommodations/modifications per a student's IEP or 504 plan 		
<p>Summative Assessment(s)</p> <ul style="list-style-type: none"> • Unit 3 Common Assessment 1 <ul style="list-style-type: none"> ○ F-IF.C.8.b • Unit 3 Common Assessment 2 <ul style="list-style-type: none"> ○ A-APR.A.1 ○ A-APR.D.6 • Unit 3 Performance Task 		<p>Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)</p> <ul style="list-style-type: none"> • Extra time, reword/repeat/clarify directions and questions, and other specific accommodations/modifications per a student's IEP or 504 plan 		

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Unit Title: Unit 4 Factoring		Timeframe/Pacing: 12 days		
Essential Questions				
<ul style="list-style-type: none"> What makes a computational strategy both effective and efficient? 				
Enduring Understandings				
<ul style="list-style-type: none"> Computational fluency includes understanding the meaning and the appropriate use of numerical operations. 				
Standards Taught and Assessed				
<ul style="list-style-type: none"> A-SSE.A.2 Use the structure of an expression to identify ways to rewrite it. A-SSE.B.3: Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression. A-REI.B.4.b: Solve quadratic equations by inspection (e.g., for $x^2 = 49$), taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions and write them as $a \pm bi$ for real numbers a and b. 				
Highlighted Interdisciplinary Connections				
<ul style="list-style-type: none"> ELA: SL.9-10.4. Present information, findings, and supporting evidence clearly, concisely, and logically. The content, organization, development, and style are appropriate to task, purpose, and audience. 				
Highlighted Career Ready Practices and 21st Century Themes and Skill				
<ul style="list-style-type: none"> 9.4.12.CI.1: Demonstrate the ability to reflect, analyze, and use creative skills and ideas 				
Social Emotional Learning Competencies				
<ul style="list-style-type: none"> 2.1.12.EH.1: Recognize one's personal traits, strengths, and limitations and identify how to develop skills to support a healthy lifestyle. 				
Pre-Assessment		Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)		
<ul style="list-style-type: none"> A-SSE.A.2 A-REI.B.4.b 		<ul style="list-style-type: none"> Extra time, reword/repeat/clarify directions and questions, and other specific accommodations/modifications per a student's IEP or 504 plan 		
Student Learning	Student Strategies	Formative Assessment	Activities and Resources	Modifications/Accommod

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Objectives: We are learning to/that...	(Mathematical Practices)			ations (ELL, Special Education, Gifted, At-Risk of Failure, 504)
A-SSE.A.2: Use the structure of an expression to identify ways to rewrite it.	SMP 8 Look for and express regularity in repeated reasoning.	Factor: $(x-5)(x+6)+(x-5)(2x+5)$ x^2+6x+7	Stations activity, discussion with examples, small group work with scaled exercises	Peer support, challenge work, individual instruction, and other accommodations/modifications as outlined in IEP/504 plan
A-SSE.B.3: Choose and produce an equivalent form of an expression	SMP 2 Reason abstractly and quantitatively.	Factor: $p^2q^2-10-2q^2+5p^2$	Stations activity, discussion with examples, small group work with scaled exercises	Peer support, challenge work, individual instruction, and other accommodations/modifications as outlined in IEP/504 plan
A-REI.B.4.b: Solve quadratic equations by ... factoring	SMP 1 Make sense of problems and persevere in solving them. SMP 4 Model with mathematics.	Solve: $-x^3+x^2=-6x$ Solve: If an object is projected upward with an initial velocity of 64ft per sec from a height of 80ft, then its height in feet t seconds after it is projected is defined by $f(t)=-16t^2+64t+80$. How long after it is projected will it hit the ground?	Discussion with examples, small group work with scaled exercises	Peer support, challenge work, individual instruction, and other accommodations/modifications as outlined in IEP/504 plan
Benchmark Assessment		Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of		

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<ul style="list-style-type: none"> ● N/A 	<p>Failure, 504)</p> <ul style="list-style-type: none"> ● Extra time, reword/repeat/clarify directions and questions, and other specific accommodations/modifications per a student's IEP or 504 plan
<p>Summative Assessment(s)</p> <ul style="list-style-type: none"> ● Unit 4 Common Assessment 1 <ul style="list-style-type: none"> ○ A-SSE.A.2 ○ A-SSE.B.3 ● Unit 4 Common Assessment 2 <ul style="list-style-type: none"> ○ A-REI.B.4.b ● Unit 4 Common Performance Task 	<p>Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)</p> <ul style="list-style-type: none"> ● Extra time, reword/repeat/clarify directions and questions, and other specific accommodations/modifications per a student's IEP or 504 plan

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Unit Title: Unit 5 Rational Expressions and Functions	Timeframe/Pacing: 15 days
Essential Questions <ul style="list-style-type: none"> ● How do you solve a rational equation? ● What makes a computational strategy both effective and efficient? 	
Enduring Understandings <ul style="list-style-type: none"> ● There can be different strategies to solve a problem, but some are more effective and efficient than others. ● Computational fluency includes understanding the meaning and the appropriate use of numerical operations 	
Standards Taught and Assessed <ul style="list-style-type: none"> ● A-SSE.A.1: Interpret expressions that represent a quantity in terms of its context. ● A-SSE.B.3: Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression. ● A-APR.D.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. ● A-CED.A.3: Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or non-viable options in a modeling context. ● A-REI.A.2: Solve simple rational and radical equations in one variable, and give examples showing how extraneous solutions may arise. 	
Highlighted Interdisciplinary Connections <ul style="list-style-type: none"> ● ELA: SL.9-10.4. Present information, findings, and supporting evidence clearly, concisely, and logically. The content, organization, development, and style are appropriate to task, purpose, and audience. 	
Highlighted Career Ready Practices and 21st Century Themes and Skill <ul style="list-style-type: none"> ● 9.4.12.CI.1: Demonstrate the ability to reflect, analyze, and use creative skills and ideas 	
Social Emotional Learning Competencies <ul style="list-style-type: none"> ● 2.1.12.EH.1: Recognize one’s personal traits, strengths, and limitations and identify how to develop skills to support a healthy lifestyle. 	
Pre-Assessment <ul style="list-style-type: none"> ● A-APR.D.7 ● A-REI.A.2 	Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504) <ul style="list-style-type: none"> ● Extra time, reword/repeat/clarify directions and questions, and other specific

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		accommodations/modifications per a student's IEP or 504 plan		
Student Learning Objectives: We are learning to/that...	Student Strategies (Mathematical Practices)	Formative Assessment	Activities and Resources	Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)
A-APR.D.7: ... multiply and divide rational expressions	SMP 7 Look for and make use of structure.	Simplify: $\frac{y^2 - 4}{2y + 4}$	Discussion with examples, small group work with scaled exercises	Peer support, challenge work, individual instruction, and other accommodations/modifications as outlined in IEP/504 plan
A-APR.D.7.; add, subtract ... rational expressions.	SMP 7 Look for and make use of structure.	Simplify: $\frac{m + 4}{m^2 - 2m - 3} - \frac{2m - 3}{m^2 - 5m + 6}$	Discussion with examples, small group work with scaled exercises	Peer support, challenge work, individual instruction, and other accommodations/modifications as outlined in IEP/504 plan
A-SSE.B.3: Choose and produce an equivalent form of an expression	SMP 7 Look for and make use of structure.	Simplify: $\frac{2}{x - 3} - \frac{5}{x^2 - 9}$	Discussion with examples, small group work with scaled exercises	Peer support, challenge work, individual instruction, and other accommodations/modifications as outlined in IEP/504 plan
A-REI.A.2: Solve simple rational ... equations in one variable, and give examples showing how extraneous solutions may arise.	SMP 1 Make sense of problems and persevere in solving them.	Solve: $\frac{2}{3x + 1} = \frac{1}{x} - \frac{6x}{3x + 1}$	Discussion with examples, small group work with scaled exercises	Peer support, challenge work, individual instruction, and other accommodations/modifications as outlined in IEP/504 plan

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<p>A-CED.A.3: Represent constraints by equations or inequalities... and interpret solutions as viable or non-viable options in a modeling context.</p>	<p>SMP 4 Model with mathematics.</p>	<p>At the airport, Bill and Cheryl are walking to the gate at the same speed to catch their flight. Since Bill wants a window seat, he steps onto the moving sidewalk and continues to walk while Cheryl uses the stationary sidewalk. If the sidewalk moves at 1m/s and Bill saves 50 sec covering the 300m distance, what is their walking speed?</p>	<p>Discussion with examples, small group work with scaled exercises</p>	<p>Peer support, challenge work, individual instruction, and other accommodations/modifications as outlined in IEP/504 plan</p>
<p>A-SSE.A.1: Interpret expressions that represent a quantity in terms of its context.</p>	<p>SMP 4 Model with mathematics.</p>	<p>Marissa's car uses 10 gal of gasoline to travel 210 miles. She has 5 gal of gasoline in the car, and she wants to know how much more gasoline she will need to drive 640 mi. If we assume the car continues to use gasoline at the same rate, how many more gallons will she need?</p>	<p>Discussion with examples, small group work with scaled exercises</p>	<p>Peer support, challenge work, individual instruction, and other accommodations/modifications as outlined in IEP/504 plan</p>
<p>Benchmark Assessment</p> <ul style="list-style-type: none"> ● Quarterly Assessment 2 		<p>Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)</p> <ul style="list-style-type: none"> ● Extra time, reword/repeat/clarify directions and questions, and other specific accommodations/modifications per a student's IEP or 504 plan 		
<p>Summative Assessment(s)</p> <ul style="list-style-type: none"> ● Unit 5 Common Assessment 1 		<p>Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)</p>		

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<ul style="list-style-type: none">○ A-APR.D.7○ A-SSE.B.3● Unit 5 Common Assessment 2<ul style="list-style-type: none">○ A-REI.A.2○ A-CED.A.3○ A-SSE.A.1● Unit 5 Performance Task	<ul style="list-style-type: none">● Extra time, reword/repeat/clarify directions and questions, and other specific accommodations/modifications per a student's IEP or 504 plan
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Unit Title: Unit 6 Radicals and Root Functions	Timeframe/Pacing: 15 days
Essential Questions <ul style="list-style-type: none"> ● How do mathematical ideas interconnect and build on one another to produce a coherent whole? ● How are expressions involving radicals and exponents related? 	
Enduring Understandings <ul style="list-style-type: none"> ● A quantity can be represented numerically in various ways. Problem solving depends upon choosing the best way to solve. ● You can write a radical expression in an equivalent form using a rational exponent instead of a radical sign. 	
Standards Taught and Assessed <ul style="list-style-type: none"> ● F-IF.C.7b: Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions. ● N-RN.A.1: Explain how the definition of the meaning of rational exponents follows from extending the properties of integer exponents to those values, allowing for a notation for radicals in terms of rational exponents. ● N-RN.A.2: Rewrite expressions involving radicals and rational exponents using the properties of exponents. ● A-SSE.A.2: Use the structure of an expression to identify ways to rewrite it. ● N-CN.A.2: Use the relation $i^2 = -1$ and the commutative, associative, and distributive properties to add, subtract, and multiply complex numbers. ● N-CN.A.3: (+) Find the conjugate of a complex number; use conjugates to find moduli and quotients of complex numbers. ● A-REI.A.2: Solve simple rational and radical equations in one variable, and give examples showing how extraneous solutions may arise. 	
Highlighted Interdisciplinary Connections <ul style="list-style-type: none"> ● ELA: L.11-12.4. Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grades 11–12 reading and content, choosing flexibly from a range of strategies 	
Highlighted Career Ready Practices and 21st Century Themes and Skill <ul style="list-style-type: none"> ● 9.4.12.CI.1: Demonstrate the ability to reflect, analyze, and use creative skills and ideas 	
Social Emotional Learning Competencies <ul style="list-style-type: none"> ● 2.1.12.EH.1: Recognize one’s personal traits, strengths, and limitations and identify how to develop skills to support a healthy lifestyle. 	
Pre-Assessment <ul style="list-style-type: none"> ● N-RN.A.2 	Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)

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<ul style="list-style-type: none"> A-SSE.A.2 		<ul style="list-style-type: none"> Extra time, reword/repeat/clarify directions and questions, and other specific accommodations/modifications per a student's IEP or 504 plan 		
Student Learning Objectives: We are learning to/that...	Student Strategies (Mathematical Practices)	Formative Assessment	Activities and Resources	Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)
A-SSE.A.2: Use the structure of an expression	SMP 7 Look for and make use of structure.	Evaluate $\sqrt{-125}$ or state that it is not real.	Discussion with examples, small group work with scaled exercises	Peer support, challenge work, individual instruction, and other accommodations/modifications as outlined in IEP/504 plan
N-RN.A.2: Rewrite expressions involving radicals and rational exponents using the properties of exponents	SMP 7 Look for and make use of structure.	Simplify $-9^{2/3}$	Discussion with examples, small group work with scaled exercises	Peer support, challenge work, individual instruction, and other accommodations/modifications as outlined in IEP/504 plan
N-RN.A.1: Explain how the definition of the meaning of rational exponents follows from extending the properties of integer exponents to those values, allowing for a notation for radicals in terms of rational exponents	SMP 2 Reason abstractly and quantitatively.	Simplify $\sqrt{x} \cdot \sqrt[3]{x}$	Discussion with examples, small group work with scaled exercises	Peer support, challenge work, individual instruction, and other accommodations/modifications as outlined in IEP/504 plan
N-RN.A.2: Rewrite expressions involving	SMP 1 Make sense of problems and persevere in	Simplify $9\sqrt{6} + 8\sqrt{54}$	Discussion with examples, small group work with	Peer support, challenge work, individual

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radicals	solving them.	Simplify $(\sqrt{5} - \sqrt{2})^2$ Simplify $\sqrt[3]{\frac{9}{32}}$	scaled exercises	instruction, and other accommodations/modifications as outlined in IEP/504 plan
A-REI.A.2: Solve simple radical equations in one variable, and give examples showing how extraneous solutions may arise	SMP 1 Make sense of problems and persevere in solving them.	Solve $\sqrt{2x+6} = x+3$	Discussion with examples, small group work with scaled exercises	Peer support, challenge work, individual instruction, and other accommodations/modifications as outlined in IEP/504 plan
F-IF.C.7b: Graph square root and cube root functions	SMP1 Make sense of problems and persevere in solving them.	Graph $f(x) = \sqrt{x-3}$	DESMOS graphing exploration	Peer support, challenge work, individual instruction, and other accommodations/modifications as outlined in IEP/504 plan
N-CN.A.2: Use the relation $i^2 = -1$ and the commutative, associative, and distributive properties to add, subtract, and multiply complex numbers.	SMP 2 Reason abstractly and quantitatively.	$\sqrt{-7}\sqrt{-3}$ Simplify $(2+3i) - (4-7i)$ Simplify $(3-4i)(7+6i)$	Discussion with examples, small group work with scaled exercises	Peer support, challenge work, individual instruction, and other accommodations/modifications as outlined in IEP/504 plan
N-CN.A.3: (+) Find the conjugate of a complex number	SMP2 Reason abstractly and quantitatively.	$\frac{8+9i}{5+2i}$ Simplify	Discussion with examples, small group work with scaled exercises	
Benchmark Assessment • N/A	Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)			

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	<ul style="list-style-type: none"> ● Extra time, reword/repeat/clarify directions and questions, and other specific accommodations/modifications per a student's IEP or 504 plan
<p>Summative Assessment(s)</p> <ul style="list-style-type: none"> ● Unit 6 Common Assessment 1 <ul style="list-style-type: none"> ○ F-IF.C.7b ○ A-SSE.A.2 ○ N-RN.A.1 ○ N-RN.A.2 ● Unit 6 Common Assessment 2 <ul style="list-style-type: none"> ○ N-RN.A.2 ○ A-REI.A.2 ● Unit 6 Common Assessment 3 <ul style="list-style-type: none"> ○ N-CN.A.2 ○ N-CN.A.3 ● Unit 6 Performance Task 	<p>Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)</p> <ul style="list-style-type: none"> ● Extra time, reword/repeat/clarify directions and questions, and other specific accommodations/modifications per a student's IEP or 504 plan

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Unit Title: Unit 7 Quadratic Equations and Inequalities	Timeframe/Pacing: 12 days
Essential Questions <ul style="list-style-type: none"> ● What makes an algebraic algorithm both effective and efficient? ● How do mathematical ideas interconnect and build on one another to produce a coherent whole? 	
Enduring Understandings <ul style="list-style-type: none"> ● One representation may sometimes be more helpful than another; used together, multiple representations give a fuller understanding of a problem. 	
Standards Taught and Assessed <ul style="list-style-type: none"> ● A-CED.A.3: Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or non-viable options in a modeling context. ● A-REI.B.4a: Use the method of completing the square to transform any quadratic equation in x into an equation of the form $(x-p)(x-q)$ that has the same solutions. Derive the quadratic formula from this form. ● A-REI.B.4b: Solve quadratic equations by inspection (e.g., for $x^2 = 49$), taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions and write them as $a \pm bi$ for real numbers a and b. ● A-CED.A.1: Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions. ● A-SSE.A.1b: Interpret complicated expressions by viewing one or more of their parts as a single entity. ● A-REI.A.2: Solve simple rational and radical equations in one variable, and give examples showing how extraneous solutions may arise. 	
Highlighted Interdisciplinary Connections <ul style="list-style-type: none"> ● ELA: SL.9-10.2. Integrate multiple sources of information presented in diverse media or formats (e.g., visually, quantitatively, qualitatively, orally) evaluating the credibility and accuracy of each source. 	
Highlighted Career Ready Practices and 21st Century Themes and Skill <ul style="list-style-type: none"> ● 9.4.12.CI.1: Demonstrate the ability to reflect, analyze, and use creative skills and ideas 	
Social Emotional Learning Competencies <ul style="list-style-type: none"> ● 2.1.12.EH.1: Recognize one's personal traits, strengths, and limitations and identify how to develop skills to support a healthy lifestyle. 	

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Pre-Assessment <ul style="list-style-type: none"> ● A.REI.B.4a ● A.REI.B.4b 		Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504) <ul style="list-style-type: none"> ● Extra time, reword/repeat/clarify directions and questions, and other specific accommodations/modifications per a student's IEP or 504 plan 		
Student Learning Objectives: We are learning to/that...	Student Strategies (Mathematical Practices)	Formative Assessment	Activities and Resources	Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)
A-REI.B.4b: Solve quadratic equations by inspection (e.g., for $x^2 = 49$), taking square roots	SMP 7 Look for and make use of structure.	Solve: $x^2-64=0$	Discussion with examples, small group work with scaled exercises	Peer support, challenge work, individual instruction, and other accommodations/modifications as outlined in IEP/504 plan
A-REI.B.4a: Use the method of completing the square to transform any quadratic equation in x into an equation of the form $(x-p)(x-q)$ that has the same solutions.	SMP 8 Look for and express regularity in repeated reasoning.	Rewrite by completing the square: $x^2-2x-24=0$	Discussion with examples, small group work with scaled exercises	Peer support, challenge work, individual instruction, and other accommodations/modifications as outlined in IEP/504 plan
A-REI.B.4b: Solve quadratic equations by... completing the square	SMP 7 Look for and make use of structure.	Solve: $x^2+4m+13=0$	Discussion with examples, small group work with scaled exercises	Peer support, challenge work, individual instruction, and other accommodations/modifications as outlined in IEP/504 plan
A-REI.B.4b: Solve quadratic equations by ... the quadratic formula... Recognize when the	SMP 1 Make sense of problems and persevere in solving them.	Solve: $(9x+3)(x-1)=-8$	Discussion with examples, small group work with	Peer support, challenge work, individual instruction, and other

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quadratic formula gives complex solutions and write them as $a \pm bi$ for real numbers a and b .			scaled exercises	accommodations/modifications as outlined in IEP/504 plan
A-SSE.A.1b: Interpret complicated expressions by viewing one or more of their parts as a single entity.	SMP 7 Look for and make use of structure.	Find the discriminant: $6x^2-x-15=0$	Discussion with examples, small group work with scaled exercises	Peer support, challenge work, individual instruction, and other accommodations/modifications as outlined in IEP/504 plan
A-REI.A.2: Solve simple rational and radical equations in one variable, and give examples showing how extraneous solutions may arise.	SMP 1 Make sense of problems and persevere in solving them.	Solve: $x = \sqrt{6x - 8}$	Discussion with examples, small group work with scaled exercises	Peer support, challenge work, individual instruction, and other accommodations/modifications as outlined in IEP/504 plan
A-CED.A.1: Create equations and inequalities in one variable and use them to solve problems. Include equations arising from ... quadratic functions	SMP 4 Model with mathematics.	Two cars left an intersection at the same time, one heading due north, the other heading due west. Some time later, they were exactly 100mi apart. The car headed north had gone 20mi farther than the car headed west. How far had each car traveled?	Discussion with examples, small group work with scaled exercises	Peer support, challenge work, individual instruction, and other accommodations/modifications as outlined in IEP/504 plan
A-CED.A.3: Represent constraints by equations or inequalities	SMP 1 Make sense of problems and persevere in solving them.	Solve: $x^2-x-12>0$	Discussion with examples, small group work with scaled exercises	Peer support, challenge work, individual instruction, and other accommodations/modifications as outlined in IEP/504 plan

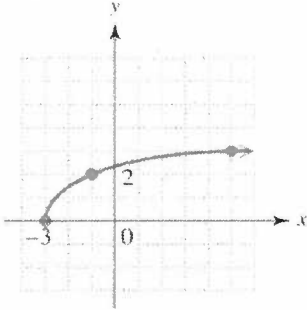
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<p>Benchmark Assessment</p> <ul style="list-style-type: none"> ● N/A 	<p>Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)</p> <ul style="list-style-type: none"> ● Extra time, reword/repeat/clarify directions and questions, and other specific accommodations/modifications per a student's IEP or 504 plan
<p>Summative Assessment(s)</p> <ul style="list-style-type: none"> ● Unit 7 Common Assessment 1 <ul style="list-style-type: none"> ○ A-REI.B.4b ○ A-SSE.A.1b ● Unit 7 Common Assessment 2 <ul style="list-style-type: none"> ○ A-CED.A.1 ○ A-REI.A.2 ○ A-REI.B.4b ● Unit 7 Common Assessment 3 <ul style="list-style-type: none"> ○ A-CED.A.3 ● Unit 7 Performance Task 	<p>Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)</p> <ul style="list-style-type: none"> ● Extra time, reword/repeat/clarify directions and questions, and other specific accommodations/modifications per a student's IEP or 504 plan

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Unit Title: Unit 8 Inverse, Exponential, and Logarithmic Functions		Timeframe/Pacing: 14 days		
Essential Questions				
<ul style="list-style-type: none"> • How can we best represent and verify algebraic relationships? • What makes an algebraic algorithm both effective and efficient? 				
Enduring Understandings				
<ul style="list-style-type: none"> • Patterns and relationships can be represented graphically, numerically, symbolically, or verbally • Algebraic and numeric procedures are interconnected and build on one another to produce a coherent whole. 				
Standards Taught and Assessed				
<ul style="list-style-type: none"> • F-BF.B.4: Find inverse functions. • F-BF.B.4a: Solve an equation of the form $f(x) = c$ for a simple function f that has an inverse and write an expression for the inverse. • F-BF.B.4c: (+) Read values of an inverse function from a graph or a table, given that the function has an inverse. • A-SSE.B.3c: Use the properties of exponents to transform expressions for exponential functions. • F-IF.C.7e: Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude. • F-BF.B.5: (+) Understand the inverse relationship between exponents and logarithms and use this relationship to solve problems involving logarithms and exponents. • A-SSE.A.1: Interpret expressions that represent a quantity in terms of its context. 				
Highlighted Interdisciplinary Connections				
<ul style="list-style-type: none"> • ELA: SL.11-12.2 Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally. 				
Highlighted Career Ready Practices and 21st Century Themes and Skill				
<ul style="list-style-type: none"> • 9.4.12.CI.1: Demonstrate the ability to reflect, analyze, and use creative skills and ideas 				
Social Emotional Learning Competencies				
<ul style="list-style-type: none"> • 2.1.12.EH.1: Recognize one's personal traits, strengths, and limitations and identify how to develop skills to support a healthy lifestyle. 				
Pre-Assessment		Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)		
<ul style="list-style-type: none"> • F-IF.C.7e • A-SSE.B.3c 		<ul style="list-style-type: none"> • Extra time, reword/repeat/clarify directions and questions, and other specific accommodations/modifications per a student's IEP or 504 plan 		
Student Learning	Student Strategies	Formative Assessment	Activities and	Modifications/Accommod

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Objectives: We are learning to/that...	(Mathematical Practices)		Resources	ations (ELL, Special Education, Gifted, At-Risk of Failure, 504)
F-BF.B.4c: (+) Read values of an inverse function from a graph or a table	SMP 6 Attend to precision	If the function is one to one, graph its inverse. 	DESMOS graphing	Peer support, challenge work, individual instruction, and other accommodations/modifications as outlined in IEP/504 plan
F-BF.B.4: Find inverse functions	SMP 7 Look for and make use of structure.	If the function is one to one, find its inverse. $\{(3, 6), (2, 10), (5, 12)\}$	Discussion with examples, small group work with scaled exercises	Peer support, challenge work, individual instruction, and other accommodations/modifications as outlined in IEP/504 plan
F-IF.C.7e: Graph exponential functions	SMP 6 Attend to precision	Graph $f(x) = 3^x$	Discussion with examples, small group work with scaled exercises	Peer support, challenge work, individual instruction, and other accommodations/modifications as outlined in IEP/504 plan
F-BF.B.4a: Solve an equation of the form $f(x) = c$ for a simple function f that has an inverse and write an expression for the inverse	SMP 7 Look for and make use of structure.	If the function is one to one, find its inverse. $y = 2x + 4$	Discussion with examples, small group work with scaled exercises	Peer support, challenge work, individual instruction, and other accommodations/modifications as outlined in IEP/504 plan

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F-BF.B.5: (+) solve problems involving exponents.	SMP 7 Look for and make use of structure.	Solve $9^{2x-8} = 9^{x-4}$	Discussion with examples, small group work with scaled exercises	Peer support, challenge work, individual instruction, and other accommodations/modifications as outlined in IEP/504 plan
A-SSE.B.3c: Use the properties of exponents to transform expressions for exponential functions	SMP 7 Look for and make use of structure.	Solve $3^{x-3} = 27^{x+1}$	Discussion with examples, small group work with scaled exercises	Peer support, challenge work, individual instruction, and other accommodations/modifications as outlined in IEP/504 plan
A-SSE.A.1: Interpret expressions that represent a quantity in terms of its context.	SMP 4 Model with mathematics.	Based on figures from 1970 through 2002, the worldwide carbon monoxide emissions in thousands of tons are approximated by the exponential function defined by $f(x) = 220,717(1.0217)^x$ where $x = 0$ corresponds to 1970, $x = 5$ corresponds to 1975, and so on. Find the amount of carbon in 1980. The population growth of an animal species is described by $F(t) = 300 + 80 \log_3 [(2t+1)]$ where t	Discussion with examples, small group work with scaled exercises	Peer support, challenge work, individual instruction, and other accommodations/modifications as outlined in IEP/504 plan

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		is measured in months. Find the population of this species in an area 1 month(s) after the species is introduced.		
F-BF.B.5: (+) solve problems involving logarithms	SMP 1 Make sense of problems and persevere in solving them.	Solve $x = \log_{27} 3$	Discussion with examples, small group work with scaled exercises	Peer support, challenge work, individual instruction, and other accommodations/modifications as outlined in IEP/504 plan
F-IF.C.7e: Graph logarithmic functions	SMP 6 Attend to precision.	Graph $f(x) = \log_2 x$	Discussion with examples, small group work with scaled exercises	Peer support, challenge work, individual instruction, and other accommodations/modifications as outlined in IEP/504 plan
F-BF.B.5: (+) Understand the inverse relationship between exponents and logarithms and use this relationship to solve problems involving logarithms and exponents.	SMP 1 Make sense of problems and persevere in solving them.	Solve $e^{3x} = 4$ Solve $\log_2(x + 1) = 3$	Discussion with examples, small group work with scaled exercises	Peer support, challenge work, individual instruction, and other accommodations/modifications as outlined in IEP/504 plan
Benchmark Assessment • N/A		Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504) • Extra time, reword/repeat/clarify directions and questions, and other specific accommodations/modifications per a student's IEP or 504 plan		
Summative Assessment(s) • Unit 8 Common Assessment 1 ○ F-BF.B.4c ○ F-BF.B.4		Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504) • Extra time, reword/repeat/clarify directions and questions, and other specific accommodations/modifications per a student's IEP or 504 plan		

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<ul style="list-style-type: none">○ F-BF.B.4a● Unit 8 Common Assessment 2<ul style="list-style-type: none">○ F-IF.C.7e○ F-BF.B.5○ A-SSE.A.1○ A-SSE.B.3c● Unit 8 Common Assessment 3<ul style="list-style-type: none">○ F-BF.B.5● Unit 8 Performance Task	
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Unit Title: Unit 9 Trigonometric Functions and Right Triangles	Timeframe/Pacing: 16 days
Essential Questions <ul style="list-style-type: none"> ● How can we best represent and verify geometric/algebraic relationships? 	
Enduring Understandings <ul style="list-style-type: none"> ● Coordinate geometry can be used to represent and verify geometric/algebraic relationships. 	
Standards Taught and Assessed <ul style="list-style-type: none"> ● G-SRT.C.6: Understand that by similarity, side ratios in right triangles are properties of angles in the triangle, leading to definitions of trigonometric ratios for acute angles. ● F-TF.A.2: Explain how the unit circle in the coordinate plane enables the extension of trigonometric functions to all real numbers, interpreted as radian measures of angles traversed counterclockwise around the unit circle. ● G-SRT.C.7: Explain and use the relationship between the sine and cosine of complementary angles. ● G-SRT.C.8: Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems ● F-TF.A.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, cosines, and tangent for x, $\pi + x$, and $2\pi - x$ in terms of their values for x, where x is any real number. 	
Highlighted Interdisciplinary Connections <ul style="list-style-type: none"> ● ELA: SL.9-10.4. Present information, findings, and supporting evidence clearly, concisely, and logically. The content, organization, development, and style are appropriate to task, purpose, and audience. 	
Highlighted Career Ready Practices and 21st Century Themes and Skill <ul style="list-style-type: none"> ● 9.4.12.CI.1: Demonstrate the ability to reflect, analyze, and use creative skills and ideas 	
Social Emotional Learning Competencies <ul style="list-style-type: none"> ● 2.1.12.EH.1: Recognize one's personal traits, strengths, and limitations and identify how to develop skills to support a healthy lifestyle. 	
Pre-Assessment <ul style="list-style-type: none"> ● G-SRT.C.6 ● F-TF.A.3 	Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504) <ul style="list-style-type: none"> ● Extra time, reword/repeat/clarify directions and questions, and other specific accommodations/modifications per a student's IEP or 504 plan

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Student Learning Objectives: We are learning to/that...	Student Strategies (Mathematical Practices)	Formative Assessment	Activities and Resources	Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)
G-SRT.C.6: side ratios in right triangles are properties of angles in the triangle	SMP 6 Attend to precision	Find $\sin \theta$ and $\tan \theta$, given that $\sec \theta = 3/5$ and θ is in QIII. Decide whether $\tan \theta = 1.4$ is possible or impossible.	Discussion with examples, small group work with scaled exercises	Peer support, challenge work, individual instruction, and other accommodations/modifications as outlined in IEP/504 plan
F-TF.A.2: Explain how the unit circle in the coordinate plane enables the extension of trigonometric functions interpreted as ... angles traversed counterclockwise around the unit circle.	SMP 6 Attend to precision	Find all six trigonometric values if: a. $\theta = 180^\circ$ b. $\theta = 270^\circ$ Evaluate $\sin^2 360^\circ + \cos^2 360^\circ$.	Discussion with examples, small group work with scaled exercises	Peer support, challenge work, individual instruction, and other accommodations/modifications as outlined in IEP/504 plan
G-SRT.C.7: Explain and use the relationship between the sine and cosine of complementary angles.	SMP 1 Make sense of problems and persevere in solving them.	Solve $\cos(\theta + 4)^\circ = \sin(3\theta + 2)^\circ$	Discussion with examples, small group work with scaled exercises	Peer support, challenge work, individual instruction, and other accommodations/modifications as outlined in IEP/504 plan
F-TF.A.3: (+) Use special triangles to determine geometrically the values of sine, cosine, tangent	SMP 2 Reason abstractly and quantitatively.	Find the six trigonometric values for $\theta = 60^\circ$	Discussion with examples, small group work with scaled exercises	Peer support, challenge work, individual instruction, and other accommodations/modifications as outlined in IEP/504 plan

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				plan
G-SRT.C.8: Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems	SMP 2 Reason abstractly and quantitatively.	Solve the triangle if C is the right angle and $B = 49.5^\circ$, $b = 1.54$.	Discussion with examples, small group work with scaled exercises	Peer support, challenge work, individual instruction, and other accommodations/modifications as outlined in IEP/504 plan
G-SRT.C.8: Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems	SMP 4 Model with mathematics.	A scientist is at a spot that has an angle of elevation of 22.7° to the top of the 315-foot observatory. How far is the scientist from the base of the observatory?	Discussion with examples, small group work with scaled exercises	Peer support, challenge work, individual instruction, and other accommodations/modifications as outlined in IEP/504 plan
Benchmark Assessment <ul style="list-style-type: none"> ● Quarterly Assessment 3 		Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504) <ul style="list-style-type: none"> ● Extra time, reword/repeat/clarify directions and questions, and other specific accommodations/modifications per a student's IEP or 504 plan 		
Summative Assessment(s) <ul style="list-style-type: none"> ● Unit 9 Common Assessment 1 <ul style="list-style-type: none"> ○ G-SRT.C.6 ○ F-TF.A.2 ● Unit 9 Common Assessment 2 <ul style="list-style-type: none"> ○ G-SRT.C.7 ○ F-TF.A.3 ○ G-SRT.C.8 ● Unit 9 Performance Task 		Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504) <ul style="list-style-type: none"> ● Extra time, reword/repeat/clarify directions and questions, and other specific accommodations/modifications per a student's IEP or 504 plan 		

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Unit Title: Unit 10 Circular Functions	Timeframe/Pacing: 12 days
Essential Questions <ul style="list-style-type: none"> ● How do the characteristics of a trigonometric function affect its graph? 	
Enduring Understandings <ul style="list-style-type: none"> ● The unit circle and graphs of trigonometric functions have an interconnected relationship. 	
Standards Taught and Assessed <ul style="list-style-type: none"> ● F-TF.A.1: Understand radian measure of an angle as the length of the arc on the unit circle subtended by the angle. ● F.TF.A.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, cosines, and tangent for x, $\pi + x$, and $2\pi - x$ in terms of their values for x, where x is any real number. ● F-TF.A.4: (+) Use the unit circle to explain symmetry (odd and even) and periodicity of trigonometric functions. ● A-CED.A.2: Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales. 	
Highlighted Interdisciplinary Connections <ul style="list-style-type: none"> ● ELA: SL.11-12.2 Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally. 	
Highlighted Career Ready Practices and 21st Century Themes and Skill <ul style="list-style-type: none"> ● 9.4.12.CI.1: Demonstrate the ability to reflect, analyze, and use creative skills and ideas 	
Social Emotional Learning Competencies <ul style="list-style-type: none"> ● 2.1.12.EH.1: Recognize one's personal traits, strengths, and limitations and identify how to develop skills to support a healthy lifestyle. 	
Pre-Assessment <ul style="list-style-type: none"> ● A-CED.A.2 ● F-TF.A.3 	Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504) <ul style="list-style-type: none"> ● Extra time, reword/repeat/clarify directions and questions, and other specific accommodations/modifications per a student's IEP or 504 plan

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Student Learning Objectives: We are learning to/that...	Student Strategies (Mathematical Practices)	Formative Assessment	Activities and Resources	Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)
F-TF.A.1: Understand radian measure	SMP 7 Look for and make use of structure.	Rewrite 110° in radians. In what quadrant does the terminal side of $\frac{11\pi}{3}$ lie?	Discussion with examples, small group work with scaled exercises	Peer support, challenge work, individual instruction, and other accommodations/modifications as outlined in IEP/504 plan
F-TF.A.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, cosines, and tangent for x , $\pi + x$, and $2\pi - x$ in terms of their values for x , where x is any real number.	SMP 8 Look for and express regularity in repeated reasoning.	Evaluate $\tan \frac{5\pi}{6}$. Find all values of θ such that $\sin\theta = -\frac{\sqrt{2}}{2}$, for $-2\pi \leq \theta \leq 2\pi$	Discussion with examples, small group work with scaled exercises	Peer support, challenge work, individual instruction, and other accommodations/modifications as outlined in IEP/504 plan
F-TF.A.4: (+) Use the unit circle to explain ... periodicity of trigonometric functions.	SMP 7 Look for and make use of structure.	Using the unit circle, graph one cycle of the parent functions $y=\sin x$ and $y=\cos x$. Using the unit circle, graph one cycle of the parent functions $y=\tan x$ and $y=\cot x$	Discussion with examples, small group work with scaled exercises	Peer support, challenge work, individual instruction, and other accommodations/modifications as outlined in IEP/504 plan

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<p>A-CED.A.2: ... graph equations on coordinate axes with labels and scales.</p>	<p>SMP 6 Attend to precision.</p>	<p>Graph $y=2\sin \frac{1}{2}x$</p> <p>Graph $y=-3\tan \pi x$</p>	<p>Discussion with examples, small group work with scaled exercises</p>	<p>Peer support, challenge work, individual instruction, and other accommodations/modifications as outlined in IEP/504 plan</p>
<p>Benchmark Assessment</p> <ul style="list-style-type: none"> • N/A 		<p>Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)</p> <ul style="list-style-type: none"> • Extra time, reword/repeat/clarify directions and questions, and other specific accommodations/modifications per a student's IEP or 504 plan 		
<p>Summative Assessment(s)</p> <ul style="list-style-type: none"> • Unit 10 Common Assessment 1 <ul style="list-style-type: none"> ○ F-TF.A.1 ○ F-TF.A.3 • Unit 10 Common Assessment 2 <ul style="list-style-type: none"> ○ F-TF.A.4 ○ A-CED.A.2 <p>Unit 10 Performance Task</p>		<p>Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)</p> <ul style="list-style-type: none"> • Extra time, reword/repeat/clarify directions and questions, and other specific accommodations/modifications per a student's IEP or 504 plan 		

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Unit Title: Unit 11 Trigonometric Identities		Timeframe/Pacing: 10 days		
Essential Questions				
<ul style="list-style-type: none"> How can you verify a trigonometric identity? 				
Enduring Understandings				
<ul style="list-style-type: none"> There can be different ways to verify an identity, but some are more effective and efficient than others. 				
Standards Taught and Assessed				
<ul style="list-style-type: none"> F-TF.C.8. Prove the Pythagorean identity $\sin^2(\theta) + \cos^2(\theta) = 1$ and use it to calculate trigonometric ratios. A-SSE.A.2 . Use the structure of an expression to identify ways to rewrite it 				
Highlighted Interdisciplinary Connections				
<ul style="list-style-type: none"> ELA: SL.9-10.4. Present information, findings, and supporting evidence clearly, concisely, and logically. The content, organization, development, and style are appropriate to task, purpose, and audience. 				
Highlighted Career Ready Practices and 21st Century Themes and Skill				
<ul style="list-style-type: none"> 9.4.12.CI.1: Demonstrate the ability to reflect, analyze, and use creative skills and ideas 				
Social Emotional Learning Competencies				
<ul style="list-style-type: none"> 2.1.12.EH.1: Recognize one’s personal traits, strengths, and limitations and identify how to develop skills to support a healthy lifestyle. 				
Pre-Assessment		Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)		
<ul style="list-style-type: none"> F-TF.C.8 A-SSE.A.2 		<ul style="list-style-type: none"> Extra time, reword/repeat/clarify directions and questions, and other specific accommodations/modifications per a student’s IEP or 504 plan 		
Student Learning Objectives: We are learning to/that...	Student Strategies (Mathematical Practices)	Formative Assessment	Activities and Resources	Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)
A-SSE.A.2 . Use the structure of an expression	SMP 2 Reason abstractly and quantitatively.	Simplify $1 - \sec^2x$	Discussion with examples, small group work with	Peer support, challenge work, individual

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to identify ways to rewrite it		Simplify $\sec \theta \cot \theta$	scaled exercises	instruction, and other accommodations/modifications as outlined in IEP/504 plan
F-TF.C.8. Prove the Pythagorean identity $\sin^2(\Theta) + \cos^2(\Theta) = 1$	SMP 2 Reason abstractly and quantitatively.	Verify $(\tan^2 \theta + 1)(\cos^2 \theta + 1) = \tan^2 \theta + 2$.	Discussion with examples, small group work with scaled exercises	Peer support, challenge work, individual instruction, and other accommodations/modifications as outlined in IEP/504 plan
F-TF.C.8. Prove the Pythagorean identity $\sin^2(\Theta) + \cos^2(\Theta) = 1$ and use it to calculate trigonometric ratios.	SMP 1 Make sense of problems and persevere in solving them.	Find $\cos \theta$ and $\tan \theta$ if $\sin \theta = 4/5$ and the terminal side of θ lies in quadrant II.	Discussion with examples, small group work with scaled exercises	Peer support, challenge work, individual instruction, and other accommodations/modifications as outlined in IEP/504 plan
Benchmark Assessment <ul style="list-style-type: none"> ● N/A 		Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504) <ul style="list-style-type: none"> ● Extra time, reword/repeat/clarify directions and questions, and other specific accommodations/modifications per a student's IEP or 504 plan 		
Summative Assessment(s) <ul style="list-style-type: none"> ● Unit 11 Common Assessment <ul style="list-style-type: none"> ○ F-TF.C.8 ○ A-SSE.A.2 ● Unit 11 Performance Task 		Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504) <ul style="list-style-type: none"> ● Extra time, reword/repeat/clarify directions and questions, and other specific accommodations/modifications per a student's IEP or 504 plan 		

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Unit Title: Unit 12 Oblique Triangles	Timeframe/Pacing: 20 days
Essential Questions <ul style="list-style-type: none"> ● How would you determine the most appropriate trigonometric function to use in various situations? 	
Enduring Understandings <ul style="list-style-type: none"> ● Knowing three parts of a triangle, you can solve any triangle using Law of Sines or Law of Cosines. 	
Standards Taught and Assessed <ul style="list-style-type: none"> ● G-SRT.D.11: (+) Understand and apply the Law of Sines and the Law of Cosines to find unknown measurements in right and non-right triangles (e.g., surveying problems, resultant forces). ● G-SRT.D.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 	
Highlighted Interdisciplinary Connections <ul style="list-style-type: none"> ● ELA: SL.11-12.1. Initiate and participate effectively in a range of collaborative discussions (one-on- one, in groups, and teacher-led) with peers on grades 11–12 topics, texts, and issues, building on others’ ideas and expressing their own clearly and persuasively. 	
Highlighted Career Ready Practices and 21st Century Themes and Skill <ul style="list-style-type: none"> ● 9.4.12.CI.1: Demonstrate the ability to reflect, analyze, and use creative skills and ideas 	
Social Emotional Learning Competencies <ul style="list-style-type: none"> ● 2.1.12.EH.1: Recognize one’s personal traits, strengths, and limitations and identify how to develop skills to support a healthy lifestyle. 	
Pre-Assessment <ul style="list-style-type: none"> ● G-SRT.D.9 ● G-SRT.D.11 	Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504) <ul style="list-style-type: none"> ● Extra time, reword/repeat/clarify directions and questions, and other specific accommodations/modifications per a student’s IEP or 504 plan

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Student Learning Objectives: We are learning to/that...	Student Strategies (Mathematical Practices)	Formative Assessment	Activities and Resources	Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)
<p>G-SRT.D.11: (+) Understand and apply the Law of Sines and the Law of Cosines to find unknown measurements in right and non-right triangles.</p>	<p>SMP 2 Reason abstractly and quantitatively.</p>	<p>Solve the triangle: LOS - SAA: $A=32$, $B=81.8$, $a=42.9$ LOS - ASA: $C=112.9$, $A=31.1$, $b=347.6$ LOS-SSA: $A=53.3$, $a=22.8$, $b=24.9$ LOC - SAS: $A=42.3$, $b=12.9$, $c=15.4$ LOC - SSS: $a=9.47$, $b=15.9$, $c=21.1$</p>	<p>Edpuzzle video, discussion with examples, small group work with scaled exercises</p>	<p>Peer support, challenge work, individual instruction, and other accommodations/modifications as outlined in IEP/504 plan</p>
<p>G-SRT.D.9. (+) Derive the formula $A = \frac{1}{2} ab \sin(C)$ for the area of a triangle</p>	<p>SMP 1 Make sense of problems and persevere in solving them.</p>	<p>Find the area of triangle ABC if $A=42.5$, $b=13.6$, $c=10.1$</p>	<p>Discussion with examples, small group work with scaled exercises</p>	<p>Peer support, challenge work, individual instruction, and other accommodations/modifications as outlined in IEP/504 plan</p>
<p>Benchmark Assessment</p> <ul style="list-style-type: none"> ● Final Assessment 	<p>Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)</p> <ul style="list-style-type: none"> ● Extra time, reword/repeat/clarify directions and questions, and other specific accommodations/modifications per a student's IEP or 504 plan 			

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<p>Summative Assessment(s)</p> <ul style="list-style-type: none">● Unit 12 Common Assessment 1<ul style="list-style-type: none">○ G-SRT.D.11○ G-SRT.D.9● Unit 12 Common Assessment 2<ul style="list-style-type: none">○ G-SRT.D.11● Unit 12 Performance Task	<p>Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)</p> <ul style="list-style-type: none">● Extra time, reword/repeat/clarify directions and questions, and other specific accommodations/modifications per a student's IEP or 504 plan
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Bibliography
Algebra 3 and Trigonometry

Digital Recommended Materials:

Lial, M. L. (2016). *Algebra and trigonometry for college readiness*. Boston: Pearson.

www.mymathlab.com