Honors Trigonometry/Algebra 3
Program of Studies Description

*40432H HONORS TRIGONOMETRY/ALGEBRA 3

(Grade 9-12) (1.0 Credit)

(Prerequisite: Honors Geometry and Honors Algebra 2, and teacher recommendation)

Students will learn about relations, functions, trigonometry, and graphing. Furthermore, they will know how to graph polynomial, exponential, logarithmic, and trigonometric functions manually and by using the appropriate technology. Students will understand how to interpret information that is expressed as a function or as a graph. These skills and this knowledge will be acquired by students working independently, with a partner, and in small groups. Achievement will be demonstrated through tests, quizzes, cooperative learning activities, oral demonstration of homework problems, and projects. Students will take the Honors Trigonometry/Algebra 3 final exam at the end of the course.

June, 2026

Honors Trigonometry/Algebra 3
Syllabus

DESCRIPTION OF COURSE: Students will learn about relations, functions, trigonometry, and graphing of functions. Furthermore, they will know how to graph polynomial, exponential, logarithmic, and trigonometric functions manually and by using the appropriate technology. Students will understand how to interpret information that is expressed as a function or as a graph. These skills and this knowledge will be acquired by students working independently, with a partner, and in small groups. Achievement will be demonstrated through tests, quiz, cooperative learning activities, oral demonstration of homework problems, and projects. Students are responsible for completing a summer assignment for this course before the school year begins. Students will take the Honors Trigonometry/Algebra 3 final exam at the end of the course.

REQUIRED TOPICS OF STUDY	SUGGESTED INSTRUCTIONAL TIME	STANDARDS/ELIGIBLE CONTENT
Prerequisites	7 days	CC.2.4.HS.B.3, CC.2.2.HS.C.1, CC.2.2.HS.C.2, CC.2.2.HS.C.3, CC.2.2.HS.C.4, CC.2.2.HS.C.5, CC.2.2.HS.C.6
Functions and Graphs	15 days	CC.2.2.HS.C.1, CC.2.2.HS.C.2, CC.2.2.HS.C.3, CC.2.2.HS.C.4, CC.2.2.HS.C.5, CC.2.2.HS.C.6, CC.2.2.HS.D.1, CC.2.2.HS.D.2, CC.2.2.HS.D.7, CC.2.2.HS.F.5, CC.2.2.HS.F.6, CC.2.2.HS.F.7
Polynomial, Power, and Rational Functions	15 days	CC.2.2.HS.C.4, CC.2.2.HS.C.5, CC.2.2.HS.D.1, CC.2.2.HS.D.2, CC.2.2.HS.D.3, CC.2.2.HS.D.5, CC.2.2.HS.D.6, CC.2.2.HS.F.1, CC.2.2.HS.F.4
Exponential and Logarithmic Functions	15 days	CC.2.2.HS.C.1, CC.2.2.HS.C.2, CC.2.2.HS.C.3, CC.2.2.HS.C.4, CC.2.2.HS.C.5, CC.2.2.HS.D.2
Trigonometric Functions	20 days	CC.2.3.HS.A.3, CC.2.3.HS.A.7, CC.2.3.HS.A.14
Analytic Trigonometry	18 days	CC.2.3.HS.A.3, CC.2.3.HS.A.7, CC.2.3.HS.A.14

RESOURCES: Precalculus Textbook(Pearson), TI-84 Graphing Calculator

June, 2026

Honors Trigonometry/Algebra 3
Curriculum Map

Unit P	***Chapter P: Prerequisites***
Big Idea	**Pre-requisite knowledge**
Unit Essential Questions:	***• Convert between decimals and fractions*** ***• Write inequalities*** ***• Apply basic properties of algebra*** ***• Work with exponents and scientific notation*** ***• Graph points*** ***• Find distances and midpoints on a number line and in a coordinate plane*** ***• write standard-form equations of circles*** ***• Solve linear equations and inequalities in one variable*** ***• Use the concepts of slope and y-intercept to graph and write linear equation in two variables.*** ***• Solve equations involving quadratic, absolute value, and fractional expressions by finding x-intercepts or intersections on graphs, by using algebraic techniques, or by using numerical techniques.*** ***• Add, subtract, multiply, and divide complex numbers*** ***• Find complex zeros of quadratic functions.*** ***• Solve inequalities involving absolute value, quadratic polynomials, and expressions involving fractions.***
Total Number of Classes for	**7**

Honors Trigonometry/Algebra 3
Curriculum Map

Unit					
Date/weeks	**PA Standards/ Eligible Content**	**Vocabulary**	**Instructional Materials**	**Common Assessments**	**Link to Profile of a Zephyr**
	M11.A.1.1 M11.D.2.1.1 M11.D M11.A.1.1.2 2.8.11.O,Q M11.C.3.1.1 2.8.11.E M11.D.2.1.3 M11.D.3.2.2 M11.D.2.1.5 2.8.11.N 2.1.11.A		Textbook: Precalculus by Demana, Waits, Foley, and Kennedy Bell Ringers worksheets Structured notes Activities Graphing Calculator Activities Computer Activities IXL Delta Math		

June, 2026

Honors Trigonometry/Algebra 3
Curriculum Map

Unit 1	***(Chapter 1)*** ***Functions and Graphs***
Big Idea	**Use numerical, graphical and algebraic models to solve functions and graphs**
Unit Essential Questions:	***• use numerical, algebraic, and graphical models to solve problems*** ***• translate from one model (algebraic,numerical and graphical) to another.*** ***• represent functions numerically, algebraically, and graphically*** ***• determine the domain and range for functions.*** ***• analyze function characteristics such as extreme values, symmetry, asymptotes, and end behavior.*** ***• recognize graphs of twelve basic functions.*** ***• determine the domain of functions related to the twelve basic functions.*** ***• combine the twelve basic functions in various ways to create new functions.*** ***• build new functions from basic functions by adding, subtracting, multiplying, dividing and composing functions.*** ***• define functions and relations parametrically.*** ***• find inverses of functions and relations.*** ***• algebraically and graphically represent translations, reflections stretches, and shrinks of functions and parametric relations.*** ***• identify appropriate basic functions with which to model real-world problems.*** ***• produce specific functions to model data, formulas, graphs, and verbal descriptions.***
Total Number of Classes for Unit	**15**

Honors Trigonometry/Algebra 3
Curriculum Map

Date/weeks	PA Standards/ Eligible Content	Vocabulary	Instructional Materials	Common Assessments	Link to Profile of a Zephyr
	2.8.11.R 2.8.11.Q 2.8.11.O 2.8.11.T 2.8.11.S		Textbook: Precalculus by Demana, Waits, Foley, and Kennedy Bell Ringers worksheets Structured notes Activities Graphing Calculator Activities Computer Activities IXL Delta Math		

June, 2026

Honors Trigonometry/Algebra 3
Curriculum Map

Unit 2	***Chapter Two*** ***Polynomial, Power, and Rational Functions***
Big Idea	**Thorough study of polynomial, power and rational equations.**
Unit Essential Questions:	***• recognize and graph linear and quadratic functions, and use these functions to model situations and solve problems.*** ***• sketch power functions in the form of $f(x) = kx^a$ (where k and a are rational numbers).*** ***• graph polynomial functions, predict their end behavior, and find their real zeros using a grapher or an algebraic method.*** ***• divide polynomials using long division or synthetic division to apply the Remainder Theorem, Factor Theorem, and Rational Zeros Theorem.*** ***• find upper and lower bounds for zeros of a polynomial.*** ***• factor polynomials with real coefficients using factors with complex coefficients.*** ***• describe the graphs of rational functions, identify horizontal and vertical asymptotes.*** ***• predict the end behavior of rational functions.*** ***• solve equations involving fractions using both algebraic and graphical techniques.*** ***• identify extraneous solutions.*** ***• solve inequalities involving polynomials and rational functions by using both algebraic and graphical techniques.***
Total Number of Days for Unit	**15**

Honors Trigonometry/Algebra 3
Curriculum Map

Dates/weeks	PA Standards/ Eligible Content	Vocabulary	Instructional Materials	Common Assessments	Link to Profile of a Zephyr
	M11.D.2.1.2 2.8.11.S 2.8.11.E 2.8.11 M11.D.2.1.5 2.8.11.N		Textbook: Precalculus by Demana, Waits, Foley, and Kennedy Bell Ringers worksheets Structured notes Activities Graphing Calculator Activities Computer Activities IXL Delta Math		

June, 2026

Honors Trigonometry/Algebra 3
Curriculum Map

Unit 3	***Unit Three: (Chapter three)*** ***Exponential, Logistic, and Logarithmic Functions***
Big Idea	**Exploring Exponential and Logarithmic Functions Algebraically and Graphically**
Unit Essential Questions:	***• evaluate exponential expressions.*** ***• graph exponential and logistic functions.*** ***• use exponential growth, decay, and regression to model real-life problems.*** ***• convert equations between logarithmic form and exponential form.*** ***• evaluate common and natural logarithms.*** ***• graph common and natural logarithmic functions.*** ***• apply the properties of logarithms to evaluate expressions.*** ***• graph logarithmic functions with base b.*** ***• re-express data.*** ***• apply the properties of logarithms to solve exponential and logarithmic equations algebraically.*** ***• solve application problems using logarithm and exponential equations.*** ***• use exponential functions and equations to solve business and finance applications related to*** **compound interest and annuities**
Total Number of Days for Unit	**15**

Dates/weeks	PA Standards/ Eligible Content	Vocabulary	Instructional Materials	Common Assessments	Link to Profile of a Zephyr

June, 2026

Honors Trigonometry/Algebra 3
Curriculum Map

	M11.A.3.1.1. 2.8.11.S 2.8.11 M11.A.3.1.1 2.8.11.R		Textbook: Precalculus by Demana, Waits, Foley, and Kennedy Bell Ringers worksheets Structured notes Activities Graphing Calculator Activities Computer Activities IXL Delta Math		

Honors Trigonometry/Algebra 3
Curriculum Map

Unit 4	***(Chapter 4)*** ***Trigonometric Functions***
Big Idea	**Exploring Trigonometric Functions Graphically and Algebraically**
Unit Essential Questions:	***• convert between radians and degrees.*** ***• find arc lengths.*** ***• convert to nautical miles*** ***• solve problems involving angular speed.*** ***• define the six trigonometric functions using the lengths of the sides of right triangle.*** ***• solve problems involving the trigonometric functions of real numbers and the properties of the sine and cosine as periodic functions.*** ***• generate the graphs of the sine and cosine functions and explore various transformations of these graphs.*** ***• generate the graphs for the tangent, cotangent, secant, and cosecant functions and to explore various transformations of these graphs.*** ***• graph sums, differences, and other combinations of trigonometric and algebraic functions.*** ***• relate the concept of inverse functions to trigonometric functions.*** ***• apply the concepts of trigonometry to solve real-world problems.***
Total Number of Days for	**20**

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Unit					
Dates/weeks	**PA Standards/ Eligible Content**	**Vocabulary**	**Instructional Materials**	**Common Assessments**	**Link to Profile of a Zephyr**
	M11.A.3.1.1. 2.8.11.S 2.8.11 M11.A.3.1.1 2.8.11.R		Textbook: Precalculus by Demana, Waits, Foley, and Kennedy Bell Ringers worksheets Structured notes Activities Graphing Calculator Activities Computer Activities IXL Delta Math		

June, 2026

Honors Trigonometry/Algebra 3
Curriculum Map

Unit 5	***Unit Five:(Chapter 5)*** ***Analytic Trigonometry***
Big Idea	**Applications of Trigonometric Functions and Their Graphs**
Unit Essential Questions:	***• use the fundamental identities to simplify trigonometric expression.*** ***• solve trigonometric equations.*** ***• decide whether an equation is an identity.*** ***• confirm identities analytically.*** ***• apply the identities for the cosine, sine, and tangent of a sum or difference.*** ***• apply the double-angle identities, power-reducing identities, and half-angle identities.*** ***• understand the proof of the Law of Sines.*** ***• use the computational applications of the Law of Sines to solve a variety of problems.*** ***• apply the Law of Cosines to solve acute and obtuse triangles.*** ***• determine the area of a triangle in terms of the measures of the sides and angles.***
Total Number of Days for Unit	**18**

Dates/weeks	PA Standards/ Eligible Content	Vocabulary	Instructional Materials	Common Assessments	Link to Profile of a Zephyr

Honors Trigonometry/Algebra 3
Curriculum Map

	2.5.11.A		Textbook: Precalculus by Demana, Waits, Foley, and Kennedy Bell Ringers worksheets Structured notes Activities Graphing Calculator Activities Computer Activities IXL Delta Math		