Curriculum Map: Accelerated Trigonometry 2022-2023

Course: ACC TRIG Sub-topic: Trigonometry

Grade(s): None specified

Course Description:	The characteristics of elementary real functions including algebraic and graphical analysis, inequalities, absolute values, logarithms, trigonometry of real numbers, plane analytic geometry, polar coordinates, complex numbers and Binomial Theorem. The first semester of the course covers trigonometry-related concepts with precalculus being the focus of the second semester. A graphing calculator without a CAS (Computer Algebra System) is required; Texas Instruments TI-Nspire recommended.
Course Textbooks, Workbooks, Materials Citations:	Textbook: Advanced Mathematical Concepts: Precalculus with Applications, Glencoe, Copyright 1999 TI-Nspire calculators

Unit: Trig Functions

Timeline: Week 35

Unit Description:	This unit covers the uses of the six trigonometric functions (sin, cos, tan, csc, sec, and cot) and how they are applied to finding the missing values (side lengths and angle measures) in all types of triangles (right and non-right).
Unit Essential Questions:	How can we express angle measures in radians and degrees? How do we evaluate the trig functions? How can we solve triangles and find the area of triangles using the trig functions?
Unit Big Ideas:	Radians Degrees Trig functions (sine, cosine, tangent, cosecant, secant, cotangent)
Unit Assignments:	Assigned book problems, quizzes, exam
Unit Key Terminology & Definitions:	radians, degrees, coterminal, reference angle, arc length, central angle, linear velocity, angular velocity, sector, sine, cosine, tangent, cosecant, secant, cotangent, law of sines, law of cosines

STANDARDS:

STANDARDS

STATE: PA Core Standards (2014)

CC.2.2.HS.C.7 (Advanced)	Apply radian measure of an angle and the unit circle to analyze the trigonometric functions.
CC.2.3.HS.A.7 (Advanced)	Apply trigonometric ratios to solve problems involving right triangles.

Topic: Angle Measures

Minutes for Topic: 80

Topic: Central Angles and Arcs

Minutes for Topic: 80

Topic: Circular Functions

Minutes for Topic: 80

Topic: Trig Functions of Special Angles
Minutes for Topic: 80

Topic: Right Triangles
Minutes for Topic: 80

Topic: The Law of Sines
Minutes for Topic: 160

Topic: The Law of Cosines
Minutes for Topic: 80

Topic: Area of Triangles
Minutes for Topic: 80

Topic: Trig Functions Exam
Minutes for Topic: 40

Unit: Trig Function Graphs

Timeline: Week 40

Unit Description:	This unit covers the graphs of trig functions and their inverses. Students will also determine amplitude, period, and phase shift for trig functions. This unit also includes applications of simple harmonic motion.
Unit Essential Questions:	How do we graph trig functions and their transformations? What are the amplitude, period, and phase shift of given trig functions? How do we graph and interpret inverse trig functions? How do we solve applications of trig functions (simple harmonic motion)?
Unit Big Ideas:	Trig functions Amplitude Period Phase shift Inverse trig functions Simple harmonic motion
Unit Assignments:	assigned book problems, quizzes, exam
Unit Key Terminology & Definitions:	trig function graphs, amplitude, period, phase shift, inverse trig functions, principal values, simple harmonic motion

Topic: Graphs of Trig Functions

Topic: Amplitude, Period, and Phase Shift

Topic: Graphing Trig Functions

Topic: Inverse Trig Functions

Topic: Principal Values of Inverse Trig Functions

Topic: Simple Harmonic Motion

Topic: Trig Function Graphs Exam
Minutes for Topic: 40

Unit: Trig Identities and Equations

Timeline: Week 45

Unit Description: This unit covers how to use and verify trig identities and solve trigonometric equations. Trig identities include the reciprocal identities, quotient identities, Pythagorean identities, sum and difference identities, and double and half-angle identities.

Unit Essential Questions: How do we use trig identities to solve problems?

How do we verify trig identities?

How do we solve trig equations using trig identities?

Unit Big Ideas: Trig identities

Trig equations

Unit Assignments: assigned book problems, quizzes, exam

Unit Key Terminology & Definitions: reciprocal identity, quotient identity, Pythagorean identity, sum identity, difference identity, double-angle identity, half-angle identity, trig equation

STANDARDS:

STANDARDS

STATE: PA Core Standards (2014)

CC.2.2.HS.C.8 (Advanced)	Choose trigonometric functions to model periodic phenomena and describe the properties of the graphs.

Topic: Basic Trig Identities

Topic: Verifying Trig Identities

Topic: Sum and Difference Identities

Topic: Double-Angle and Half-Angle Identities

Topic: Solving Trig Equations

Topic: Trig Identities and Equations Exam
Minutes for Topic: 40

Unit: Conics

Timeline: Week 49

Unit Description: This unit covers the four categories of conic sections: circles, parabolas, ellipses, and hyperbolas. Students will write equations of and graph the conic sections. Students will also solve applications of conic sections.

Unit Essential Questions: How do we write the equation of a circle, parabola, ellipse, or hyperbola given certain information?

How do we graph conic sections given an equation or a description?

How do we determine the type of conic section when given its equation?

Unit Big Ideas: Circle

Parabola

Ellipse

Hyperbola

Conic section

Unit Assignments: assigned book problems, quizzes

Unit Key Terminology & Definitions: standard form, general form, circle, parabola, ellipse, hyperbola, conic section

STANDARDS:

STANDARDS

STATE: PA Core Standards (2014)

CC.2.3.HS.A.10 (Advanced)	Translate between the geometric description and the equation for a conic section.

Topic: The Circle

Topic: The Parabola

Topic: The Ellipse

Topic: The Hyperbola

Unit: Exponential and Logarithmic Functions

Timeline: Week 1

Unit Description: This unit covers how to use the properties of exponents and logarithms to solve equations and graph exponential and logarithmic functions.

Unit Essential Questions: How do we use the properties of exponents and logarithms to solve problems?

How do we solve equations using the properties of exponents and logarithms?

How do we graph exponential and logarithmic functions?

Unit Big Ideas: Exponents

Logarithms

Unit Assignments: Assigned book problems, quizzes, exam

Unit Key Terminology & Definitions: exponents, exponential functions, exponential inequalities, logarithms, logarithmic functions, logarithmic inequalities, common logarithm, natural logarithm

Topic: Rational Exponents

Topic: Exponential Functions

Topic: The Number e

Topic: Logarithmic Functions

Topic: Exponential and Logarithmic Equations

Topic: Applications of Common and Natural Logarithms

Topic: Exponential and Logarithmic Functions Exam

Minutes for Topic: 40

Unit: Linear Relations and Functions

Timeline: Week 5

Unit Description:	This unit covers relations, functions, composites, and inverses. Students will work with various operations with linear equations, such as writing equations of lines, finding the distance between two points, identifying the slope, and identifying the midpoint of a line segment.
Unit Essential Questions:	How do we define relations, functions, composite functions, and inverses? How do we write the equation of a line with given information? How do we find the distance between two points on a coordinate plane? How do we find the slope of a line through two given points? How do we find the midpoint of a given line segment on a coordinate plane?
Unit Big Ideas:	Relation Function Composite function Inverse Linear equation Distance formula Slope Midpoint
Unit Assignments:	assigned book problems, quizzes, exam
Unit Key Terminology & Definitions:	relation, function, domain, range, composite function, inverse, inverse function, zeros, linear equation, linear inequality, distance formula, slope, analytic geometry, slope-intercept form, point-slope form, parallel, perpendicular

Topic: Relations and Functions

Topic: Composition and Inverses of Functions

Topic: Linear Functions and Inequalities

Topic: Distance and Slope

Topic: Forms of Linear Equations

Topic: Parallel and Perpendicular Lines

Topic: Linear Relations and Functions Exam
Minutes for Topic: 40

Unit: Systems of Equations and Inequalities
Timeline: Week 9

Unit Description:	This unit covers the methods for solving systems of equations and inequalities. Systems of equations are solved by graphing, substitution, and elimination. Systems of inequalities are solved graphically.

Topic: Systems of Equations

Topic: Systems of Inequalities

Unit: Nature of Graphs
Timeline: Week 12

Unit Description: This unit covers various graphing topics. Lessons include graph symmetry, transformations of graphs, and particular emphasis on rational functions and their asymptotes and discontinuities.

Topic: Symmetry

Topic: Families of Graphs

Topic: Rational Functions and Asymptotes

Topic: Graphs of Inequalities

Topic: Nature of Graphs Exam
Minutes for Topic: 40

Unit: Polynomial and Rational Functions
Timeline: Week 16

This Curriculum Map Unit has no Topics to display

Unit: Polar Coordinates
Timeline: Week 19

This Curriculum Map Unit has no Topics to display