AP Pre-Calculus

Overview Information

Title of Course: AP Pre-Calculus	
Course Author(s): Math Department, Natasha Roberts and Aaron Aubrey	Schools where the course will be taught: Archie Williams High School
Length of Course: 1 year	Subject Area and Discipline: Mathematics
Grade Levels: 11th-12th	Is this course an integrated course? No
Is this course being submitted for possible UC honors designation? No	Are you seeking UC approval? Yes If so, in what area (A-G)? C, mathematics "Pending UC approval, Feb 2026"
Prerequisites (required or recommended): Successful completion of Advanced Algebra or Advanced Algebra Honors	Co-requisites (required or recommended): None
Check all that apply: ✅ UC A-G course ❏ Graduation Requirement (specify the requirement this course meets) ✅ Elective ✅ Honors/AP ❏ CTE	

Introduction to the Course

Course Overview: AP Precalculus centers on functions modeling dynamic phenomena. This research-based exploration of functions is designed to better prepare students for college-level calculus and provide grounding for other mathematics and science courses. In this course, students study a broad spectrum of function types that are foundational for careers in mathematics, physics, biology, health science, business, social science, and data science. Furthermore, as AP Precalculus may be the last mathematics course of a student's secondary education, the course is structured to provide a coherent capstone experience rather than exclusively focusing on preparation for future courses.

Throughout this course, students develop and hone symbolic manipulation skills, including solving equations and manipulating expressions, for the many function types throughout the course.

Students also learn that functions and their compositions, inverses, and transformations are understood through graphical, numerical, analytical, and verbal representations, which reveal different attributes of the functions and are useful for solving problems in mathematical and applied contexts. In turn, the skills learned in this course are widely applicable to situations that involve quantitative reasoning.

AP Precalculus fosters the development of a deep conceptual understanding of functions. Students learn that a function is a mathematical relation that maps a set of input values—the domain—to a set of output values—the range—such that each input value is uniquely mapped to an output value. Students understand functions and their graphs as embodying dynamic covariation of quantities, a key idea in preparing for calculus. With each function type, students develop and validate function models based on the characteristics of a bivariate data set, characteristics of covarying quantities and their relative rates of change, or a set of characteristics such as zeros, asymptotes, and extrema. These models are used to interpolate, extrapolate, and interpret information with different degrees of accuracy for a given context or data set. Additionally, students also learn that every model is subject to assumptions and limitations related to the context. As a result of examining functions from many perspectives, students develop a conceptual understanding not only of specific function types but also of functions in general. This type of understanding helps students to engage with both familiar and novel contexts.

Students should be engaged in meaningful culturally relevant instructional practices that develop conceptual understanding, procedural fluency and application to real-life situations. Teachers will use high-impact instructional strategies such as those outlined in the Tam4Ward Instructional toolkit.

Students should be provided ample opportunity to work collaboratively with others to communicate their mathematical thinking. They should be encouraged to share multiple solutions and strategies to solve complex problems. Students should be engaged in productive struggle so that they may learn to persevere and feel a sense of accomplishment in solving complex mathematical problems.

In addition to the content taught in this course, students should continue to work on developing their fluency in skills from previous mathematics courses. Students should develop an awareness of their own learning and level of understanding and be provided appropriate scaffolds and support to make progress towards mastery,regardless of their background, the language of origin, or foundational knowledge.

Ongoing daily formative assessments in the form of openers, warm ups, activities, group work, assignments, and teacher observations should be utilized to inform instruction.

Students will build fluency using a graphing calculator in order to be well prepared for AP Calculus. Various graphing calculator skills are built into each unit and students should have access to these calculators and use them regularly.

College Board AP Precalculus Course

All Unit Outcomes are aligned with the AP PreCalculus of the College Board

Unit 1: *Polynomial and Rational Functions*

Unit Summary:

In Unit 1, students develop understanding of two key function concepts while exploring polynomial and rational functions. The first concept is covariation, or how output values change in tandem with changing input values. The second concept is rates of change, including average rate of change, rate of change at a point, and changing rates of change. The central idea of a function as a rule for relating two simultaneously changing sets of values provides students with a vital tool that has many applications, in nature, human society, and business and industry. For example, the idea of crop yield increasing but at a decreasing rate or the efficacy of a medicine decreasing but at an increasing rate are important understandings that inform critical decisions.

Essential Questions:

- How do we model the intensity of light from its source?
- How can I use data and graphs to figure out the best time to purchase event tickets?
- How can we adjust known projectile motion models to account for changes in conditions?

Building the Mathematical Practices: Throughout the course, students should practice communicating mathematics and developing notational fluency—and that practice should begin in Unit 1. Students should use precise language such as, "On the closed interval 0 to 1, as the value of x increases, the value of y increases then decreases." To the fullest extent possible, students should work on functions presented in contextual scenarios such as graphs showing distance vs. time, tables showing velocity vs. time, or scenarios involving volume vs. time. In these contexts, students should use clear language when referring to variables and functions, including units of measure as appropriate. For example, when considering a problem of filling a pool with water, a student may write, "The input values of the function V are times in minutes, and the output values are volumes in cubic meters. The average rate of change of the function V over the time interval t equals 2 minutes to t equals 5 minutes is 0.4 cubic meters per minute." Practicing communicating with precise language can help students clarify their thinking and make important connections while revealing misconceptions.

Unit Outcomes: Key Topics and Suggested Skill Focus

Topic	Instructional Periods	Suggested Skill Focus
1.1 Change in Tandem	2	2.B Construct equivalent graphical, numerical, analytical, and verbal representations of functions that are useful in a given mathematical or applied context, with and without technology. 3.A Describe the characteristics of a function with varying levels of precision, depending on the function representation and available mathematical tools.
1.2 Rates of Change	2	2.A Identify information from graphical, numerical, analytical, and verbal representations to answer a question or construct a model, with and without technology. 3.A Describe the characteristics of a function with varying levels of precision, depending on the function representation and available mathematical tools.
1.3 Rates of Change in Linear and Quadratic Functions	2	3.B Apply numerical results in a given mathematical or applied context. 3.C Support conclusions or choices with a logical rationale or appropriate data.
1.4 Polynomial Functions and Rates of Change	2	2.A Identify information from graphical, numerical, analytical, and verbal representations to answer a question or construct a model, with and without technology. 3.A Describe the characteristics of a function with varying levels of precision, depending on the function representation and available mathematical tools.
1.5 Polynomial Functions and Complex Zeros	2–3	1.B Express functions, equations, or expressions in analytically equivalent forms that are useful in a given mathematical or applied context. 2.B Construct equivalent graphical, numerical, analytical, and verbal representations of functions that are useful in a given mathematical or applied context, with and without technology.
1.6 Polynomial Functions and End Behavior	1–2	3.A Describe the characteristics of a function with varying levels of precision, depending on the function representation and available mathematical tools.
1.7 Rational Functions and End Behavior	2–3	1.B Express functions, equations, or expressions in analytically equivalent forms that are useful in a given mathematical or applied context. 3.A Describe the characteristics of a function with varying levels of precision, depending on the function representation and available mathematical tools.
1.8 Rational Functions and Zeros	1–2	1.A Solve equations and inequalities represented analytically, with and without technology.

1.9 Rational Functions and Vertical Asymptotes	1–2	2.A Identify information from graphical, numerical, analytical, and verbal representations to answer a question or construct a model, with and without technology.
1.10 Rational Functions and Holes	1–2	3.C Support conclusions or choices with a logical rationale or appropriate data.
1.11 Equivalent Representations of Polynomial and Rational Expressions	2–3	1.B Express functions, equations, or expressions in analytically equivalent forms that are useful in a given mathematical or applied context. 3.B Apply numerical results in a given mathematical or applied context.
1.12 Transformations of Functions	2–3	1.C Construct new functions, using transformations, compositions, inverses, or regressions, that may be useful in modeling contexts, criteria, or data, with and without technology. 3.A Describe the characteristics of a function with varying levels of precision, depending on the function representation and available mathematical tools.
1.13 Function Model Selection and Assumption Articulation	2–3	2.A Identify information from graphical, numerical, analytical, and verbal representations to answer a question or construct a model, with and without technology. 3.C Support conclusions or choices with a logical rationale or appropriate data.
1.14 Function Model Construction and Application	2–3	1.C Construct new functions, using transformations, compositions, inverses, or regressions, that may be useful in modeling contexts, criteria, or data, with and without technology. 3.B Apply numerical results in a given mathematical or applied context.

Sample Unit Assignments:

- Textbook practice - on paper and online
- Desmos activities
- Math Medic lessons, assignments & formative assessments
- Examples of real life application problems

Sample Unit Assessment:

- Sample Assessment from College Board

Unit 2: Exponential and Logarithmic Functions

Unit Summary:
In Unit 2, students build an understanding of exponential and logarithmic functions. Exponential and logarithmic function models are widespread in the natural and social sciences. When an aspect of a phenomenon changes proportionally to the existing amount, exponential and logarithmic models are employed to harness the information. Exponential functions are key to modeling population growth, radioactive decay, interest rates, and the amount of medication in a patient. Logarithmic functions are useful in modeling sound intensity and frequency, the magnitude of earthquakes, the pH scale in chemistry, and the working memory in humans. The study of these two function types touches careers in business, medicine, chemistry, physics, education, and human geography, among others.

Essential Questions

■ How can I make a single model that merges the interest I earn from my bank with the taxes that are due so I can know how much I will have in the end?

■ How can we adjust the scale of distance for a model of planets in the solar system so the relationships among the planets are easier to see?

■ If different functions can be used to model data, how do we pick which one is best?

Building the Mathematical Practices: Students should learn to communicate differences and similarities among arithmetic sequences, linear functions, geometric sequences, and exponential functions. Students can develop a deeper understanding of these four function types by considering how each would be represented in a graph, in a table, in an analytical representation, and through verbal descriptions of related scenarios. Examining multiple representations is also powerful in understanding composition of functions and relationships between functions and their inverse functions. In this unit, multiple representations should be used to explore the inverse relationship between exponential and logarithmic functions.

Unit Outcomes: Key Topics and Suggested Skill Focus

Topic	Instructional Periods	Suggested Skill Focus
2.1 Change in Arithmetic and Geometric Sequences	2	**1.B** Express functions, equations, or expressions in analytically equivalent forms that are useful in a given mathematical or applied context. **3.A** Describe the characteristics of a function with varying levels of precision, depending on the function representation and available mathematical tools.
2.2 Change in Linear and Exponential Functions	2	**1.C** Construct new functions, using transformations, compositions, inverses, or regressions, that may be useful in modeling contexts, criteria, or data, with and without technology. **3.B** Apply numerical results in a given mathematical or applied context.
2.3 Exponential Functions	1–2	**3.A** Describe the characteristics of a function with varying levels of precision, depending on the function representation and available mathematical tools.
2.4 Exponential Function Manipulation	2	**1.B** Express functions, equations, or expressions in analytically equivalent forms that are useful in a given mathematical or applied context. **3.A** Describe the characteristics of a function with varying levels of precision, depending on the function representation and available mathematical tools.
2.5 Exponential Function Context and Data Modeling	2–3	**1.C** Construct new functions, using transformations, compositions, inverses, or regressions, that may be useful in modeling contexts, criteria, or data, with and without technology. **3.B** Apply numerical results in a given mathematical or applied context.
2.6 Competing Function Model Validation	2–3	**2.A** Identify information from graphical, numerical, analytical, and verbal representations to answer a question or construct a model, with and without technology. **3.C** Support conclusions or choices with a logical rationale or appropriate data.
2.7 Composition of Functions	2–3	**1.C** Construct new functions, using transformations, compositions, inverses, or regressions, that may be useful in modeling contexts, criteria, or data, with and without technology. **2.B** Construct equivalent graphical, numerical, analytical, and verbal representations of functions that are useful in a given mathematical or applied context, with and without technology.
2.8 Inverse Functions	2–3	**1.A** Solve equations and inequalities represented analytically, with and without technology. **2.B** Construct equivalent graphical, numerical, analytical, and verbal representations of functions that are useful in a given mathematical or applied context, with and without technology.

2.9 Logarithmic Expressions	1–2	1.B Express functions, equations, or expressions in analytically equivalent forms that are useful in a given mathematical or applied context.
2.10 Inverses of Exponential Functions	2	1.C Construct new functions, using transformations, compositions, inverses, or regressions, that may be useful in modeling contexts, criteria, or data, with and without technology. 2.B Construct equivalent graphical, numerical, analytical, and verbal representations of functions that are useful in a given mathematical or applied context, with and without technology.
2.11 Logarithmic Functions	1–2	3.A Describe the characteristics of a function with varying levels of precision, depending on the function representation and available mathematical tools.
2.12 Logarithmic Function Manipulation	2–3	1.B Express functions, equations, or expressions in analytically equivalent forms that are useful in a given mathematical or applied context. 3.A Describe the characteristics of a function with varying levels of precision, depending on the function representation and available mathematical tools.
2.13 Exponential and Logarithmic Equations and Inequalities	3–4	1.A Solve equations and inequalities represented analytically, with and without technology. 1.B Express functions, equations, or expressions in analytically equivalent forms that are useful in a given mathematical or applied context. 1.C Construct new functions, using transformations, compositions, inverses, or regressions, that may be useful in modeling contexts, criteria, or data, with and without technology.
2.14 Logarithmic Function Context and Data Modeling	2–3	1.C Construct new functions, using transformations, compositions, inverses, or regressions, that may be useful in modeling contexts, criteria, or data, with and without technology. 3.B Apply numerical results in a given mathematical or applied context.
2.15 Semi-log Plots	2–3	2.B Construct equivalent graphical, numerical, analytical, and verbal representations of functions that are useful in a given mathematical or applied context, with and without technology. 3.C Support conclusions or choices with a logical rationale or appropriate data.

Sample Unit Assignments:

- Textbook practice - on paper and online
- Desmos activities
- Math Medic lessons, assignments & formative assessments
- Examples of real life application problems

Sample unit Assessment:

- Sample Assessments from College Board

Unit 3: Trigonometric and Polar Functions

Unit Summary:
In Unit 3, students explore trigonometric functions and their relation to the angles and arcs of a circle. Since their output values repeat with every full revolution around the circle, trigonometric functions are ideal for modeling periodic, or repeated pattern phenomena, such as: the highs and lows of a wave, the blood pressure produced by a heart, and the angle from the North Pole to the Sun year to year. Furthermore, periodicity is found in human inventions and social phenomena. For example, moving parts of an analog clock are modeled by a trigonometric function with respect to each other or with respect to time; traffic flow at an intersection over the course of a week demonstrates daily periodicity; and demand for a particular product over the course of a year falls into an annually repeating pattern. Polar functions, which are also explored in this unit, have deep ties to trigonometric functions as they are both based on the circle. Polar functions are defined on the polar coordinate system that uses the circular concepts of radii and angles to describe location instead of rectangular concepts of left-right and up-down, which students have worked with previously. Trigonometry serves as the bridge between the two systems.

Essential Questions
■ Since energy usage goes up and down through the year, how can I use trends in data to predict my monthly
electricity bills when I get my first apartment?
■ How do we model aspects of circular and spinning objects without using complex equations from the x-y rectangular-based coordinate system?
■ How does right triangle trigonometry from geometry relate to trigonometric functions?

Building the Mathematical Practices: Students should have multiple experiences transitioning among, and communicating about, the various representations of trigonometric functions, especially sinusoidal functions. It is important that, in addition to solving trigonometric equations and finding equivalent trigonometric expressions, students build sinusoidal models with and without technology and practice constructing different representations. As students transition to thinking in the polar plane, they will refine their communications related to characteristics of functions. The more casual language that students may have adopted such as “goes up” and “goes down” will need to be replaced with more careful language that addresses a function’s behavior related to angles and radii.

Unit Outcomes: Key Topics and Suggested Skill Focus

Topic	Instructional Periods	Suggested Skill Focus
3.1 Periodic Phenomena	2	2.B Construct equivalent graphical, numerical, analytical, and verbal representations of functions that are useful in a given mathematical or applied context, with and without technology. 3.A Describe the characteristics of a function with varying levels of precision, depending on the function representation and available mathematical tools.
3.2 Sine, Cosine, and Tangent	2–3	2.A Identify information from graphical, numerical, analytical, and verbal representations to answer a question or construct a model, with and without technology. 3.A Describe the characteristics of a function with varying levels of precision, depending on the function representation and available mathematical tools.
3.3 Sine and Cosine Function Values	2–3	2.A Identify information from graphical, numerical, analytical, and verbal representations to answer a question or construct a model, with and without technology. 3.B Apply numerical results in a given mathematical or applied context.
3.4 Sine and Cosine Function Graphs	2–3	2.A Identify information from graphical, numerical, analytical, and verbal representations to answer a question or construct a model, with and without technology. 3.A Describe the characteristics of a function with varying levels of precision, depending on the function representation and available mathematical tools.
3.5 Sinusoidal Functions	2–3	2.A Identify information from graphical, numerical, analytical, and verbal representations to answer a question or construct a model, with and without technology. 3.A Describe the characteristics of a function with varying levels of precision, depending on the function representation and available mathematical tools.
3.6 Sinusoidal Function Transformations	2–3	1.C Construct new functions, using transformations, compositions, inverses, or regressions, that may be useful in modeling contexts, criteria, or data, with and without technology. 2.B Construct equivalent graphical, numerical, analytical, and verbal representations of functions that are useful in a given mathematical or applied context, with and without technology.
3.7 Sinusoidal Function Context and Data Modeling	2–3	1.C Construct new functions, using transformations, compositions, inverses, or regressions, that may be useful in modeling contexts, criteria, or data, with and without technology. 3.C Support conclusions or choices with a logical rationale or appropriate data.
3.8 The Tangent Function	2	2.A Identify information from graphical, numerical, analytical, and verbal representations to answer a question or construct a model, with and without technology. 3.A Describe the characteristics of a function with varying levels of precision, depending on the function representation and available mathematical tools.

3.9 Inverse Trigonometric Functions	2–3	1.C Construct new functions, using transformations, compositions, inverses, or regressions, that may be useful in modeling contexts, criteria, or data, with and without technology. 2.B Construct equivalent graphical, numerical, analytical, and verbal representations of functions that are useful in a given mathematical or applied context, with and without technology.
3.10 Trigonometric Equations and Inequalities	3–4	1.A Solve equations and inequalities represented analytically, with and without technology. 2.A Identify information from graphical, numerical, analytical, and verbal representations to answer a question or construct a model with and without technology. 3.B Apply numerical results in a given mathematical or applied context.
3.11 The Secant, Cosecant, and Cotangent Functions	2	2.B Construct equivalent graphical, numerical, analytical, and verbal representations of functions that are useful in a given mathematical or applied context, with and without technology. 3.A Describe the characteristics of a function with varying levels of precision, depending on the function representation and available mathematical tools.
3.12 Equivalent Representations of Trigonometric Functions	3–4	1.A Solve equations and inequalities represented analytically, with and without technology. 1.B Express functions, equations, or expressions in analytically equivalent forms that are useful in a given mathematical or applied context. 3.B Apply numerical results in a given mathematical or applied context.
3.13 Trigonometry and Polar Coordinates	2–3	1.B Express functions, equations, or expressions in analytically equivalent forms that are useful in a given mathematical or applied context. 2.A Identify information from graphical, numerical, analytical, and verbal representations to answer a question or construct a model with and without technology.
3.14 Polar Function Graphs	2–3	2.B Construct equivalent graphical, numerical, analytical, and verbal representations of functions that are useful in a given mathematical or applied context, with and without technology. 3.A Describe the characteristics of a function with varying levels of precision, depending on the function representation and available mathematical tools.
3.15 Rates of Change in Polar Functions	2–3	3.A Describe the characteristics of a function with varying levels of precision, depending on the function representation and available mathematical tools. 3.C Support conclusions or choices with a logical rationale or appropriate data.

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Sample Unit Assignments:

- Textbook practice - on paper and online
- Desmos activities
- Math Medic lessons, assignments & formative assessments
- Examples of real life application problems

Sample Unit Assessment:

- Sample Assessments from College Board

Unit 4: Functions Involving Parameters, Vectors, and Matrices
*Unit 4 describes additional topics that teachers may include based on state or local requirements. The Unit 4 topics extend and deepen the function concepts developed in units one through three. The Unit 4 topics are additional and excluded from the AP Exam. **Unit Summary:** In Unit 4, students explore function types that expand their understanding of the function concept. Parametric functions have multiple dependent variables' values paired with a single input variable or parameter. Modeling scenarios with parametric functions allows students to explore change in terms of components. This component-based understanding is important not only in calculus but in all fields of the natural and social sciences where we seek to understand one aspect of a phenomenon independent of other confounding aspects. Another major function type in this unit involves matrices mapping a set of input vectors to output vectors. The capacity to map large quantities of vectors instantaneously is the basis for vector-based computer graphics. While students may see their favorite video game character trip and fall or seemingly move closer or farther, matrices implement a rotation on a set of vectors or a dilation on a set of vectors. The power of matrices to map vectors is not limited to graphics but to any system that can be expressed in terms of components of vectors such as electrical systems, network connections, and regional population distribution changes over time. Vectors and matrices are also powerful tools of data science as they can be used to model aspects of complex scientific and social science phenomena. **Essential Questions:** ■ How can we determine when the populations of species in an ecosystem will be relatively steady? ■ How can we analyze the vertical and horizontal aspects of motion independently? ■ How does high-resolution computer-generated imaging achieve smooth and realistic motion on screen with so many pixels? **Building Mathematical Practices** When encountering new function types, students should engage with multiple representations of each function type and practice communicating precise characteristics of these function types. For parametric and vector-valued functions, students will need to use care in communicating about the position or velocity of an object, depending on the function that is given. Students should practice the precise language used with particle motion in the plane and refer specifically to position, direction, and motion. It will be valuable for students to provide clear rationales when setting up and working with matrices as linear transformation functions on vectors. Students should explain why they took the steps they did.
Unit Outcomes: Key Topics and Suggested Skill Focus

Topic	Instructional Periods	Suggested Skill Focus
4.1 Parametric Functions	2	1.A Solve equations and inequalities represented analytically, with and without technology. 2.B Construct equivalent graphical, numerical, analytical, and verbal representations of functions that are useful in a given mathematical or applied context, with and without technology.
4.2 Parametric Functions Modeling Planar Motion	2	3.A Describe the characteristics of a function with varying levels of precision, depending on the function representation and available mathematical tools. 3.B Apply numerical results in a given mathematical or applied context.
4.3 Parametric Functions and Rates of Change	2	3.B Apply numerical results in a given mathematical or applied context. 3.C Support conclusions or choices with a logical rationale or appropriate data.
4.4 Parametrically Defined Circles and Lines	2	1.B Express functions, equations, or expressions in analytically equivalent forms that are useful in a given mathematical or applied context. 1.C Construct new functions, using transformations, compositions, inverses, or regressions, that may be useful in modeling contexts, criteria, or data, with and without technology.
4.5 Implicitly Defined Functions	2	2.B Construct equivalent graphical, numerical, analytical, and verbal representations of functions that are useful in a given mathematical or applied context, with and without technology. 3.A Describe the characteristics of a function with varying levels of precision, depending on the function representation and available mathematical tools.
4.6 Conic Sections	3	1.B Express functions, equations, or expressions in analytically equivalent forms that are useful in a given mathematical or applied context. 2.A Identify information from graphical, numerical, analytical, and verbal representations to answer a question or construct a model, with and without technology. 2.B Construct equivalent graphical, numerical, analytical, and verbal representations of functions that are useful in a given mathematical or applied context, with and without technology.
4.7 Parametrization of Implicitly Defined Functions	2	1.B Express functions, equations, or expressions in analytically equivalent forms that are useful in a given mathematical or applied context. 2.A Identify information from graphical, numerical, analytical, and verbal representations to answer a question or construct a model, with and without technology.

4.8 Vectors	3	2.A Identify information from graphical, numerical, analytical, and verbal representations to answer a question or construct a model, with and without technology. 3.A Describe the characteristics of a function with varying levels of precision, depending on the function representation and available mathematical tools. 3.B Apply numerical results in a given mathematical or applied context.
4.9 Vector-Valued Functions	1	3.C Support conclusions or choices with a logical rationale or appropriate data.
4.10 Matrices	2	1.B Express functions, equations, or expressions in analytically equivalent forms that are useful in a given mathematical or applied context. 3.B Apply numerical results in a given mathematical or applied context.
4.11 The Inverse and Determinant of a Matrix	2	1.B Express functions, equations, or expressions in analytically equivalent forms that are useful in a given mathematical or applied context. 3.B Apply numerical results in a given mathematical or applied context.
4.12 Linear Transformations and Matrices	1	1.B Express functions, equations, or expressions in analytically equivalent forms that are useful in a given mathematical or applied context.
4.13 Matrices as Functions	3	1.B Express functions, equations, or expressions in analytically equivalent forms that are useful in a given mathematical or applied context. 2.A Identify information from graphical, numerical, analytical, and verbal representations to answer a question or construct a model, with and without technology. 3.A Describe the characteristics of a function with varying levels of precision, depending on the function representation and available mathematical tools.
4.14 Matrices Modeling Contexts	3	1.C Construct new functions, using transformations, compositions, inverses, or regressions, that may be useful in modeling contexts, criteria, or data, with and without technology. 3.B Apply numerical results in a given mathematical or applied context. 3.C Support conclusions or choices with a logical rationale or appropriate data.

Sample Unit Assignments:

- Textbook practice - on paper and online
- Desmos activities to develop understanding of transformations and parent functions
- Math Medic lessons, assignments & formative assessments
- Examples of real life application problems

Sample unit Assessment:
*This unit is not tested on the AP Exam

- Sample Assessments

Recommended Texts and Resources:

- Precalculus 7th edition, Blitzer (Pearson), using MyMathLab as the online component
  Current adopted textbook for PreCalculus as of 2023, which is also College Board approved textbook for AP PreCalculus

Supplemental Resources:

- Math Medic AP Precalculus
  Free online lesson plans for teachers, Subscription available for assignments & assessments
  Approved by the College Board as an AP PreCalculus textbook - Syllabus
- College Board AP Precalculus Course
  AP Classroom has numerous videos, lessons, practice assessments
  Available to students and teachers upon completion of College Board audit

College Board AP Precalculus Course	**Unit 1 -** Polynomial & Rational Functions	**Unit 2 -** Exponential & Logarithmic Functions	**Unit 3 -** Trigonometric and Polar Functions	**Unit 4 -** Functions Involving Parameters, Vectors, and Matrices
PreCalculus, 7th Edition, Blitzer 2022	Chapters 1-2	Chapter 3	Chapters 4-6	Chapters 6, 8, 9
Math Medic AP Precalculus	AP PreCalculus Units 1-3	AP PreCalculus Units 4-5	AP PreCalculus Units 6-8	PreCalculus Unit 10

Board Approval Date: November 18, 2025

Updated: New Course, Fall 2025

UC Math "Area C": Feb. 2026