# Course at a Glance

## Plan

The Course at a Glance provides a useful visual organization for the AP Precalculus curricular components, including:

- Sequence of units, along with approximate weighting and suggested pacing. Please note, pacing is based on 45-minute class periods, meeting five days each week for a full academic year.
- Progression of topics within each unit.

## Teach

**MATHEMATICAL PRACTICES**

1 Procedural and Symbolic Fluency
2 Multiple Representations
3 Communication and Reasoning

## Required Course Content

Each topic contains required Learning Objectives and Essential Knowledge statements that form the basis of the assessment on the AP Exam.

## Assess

Assign the Progress Checks—either as homework or in class—for each unit. Each Progress Check contains formative multiple-choice and free-response questions. The feedback from each Progress Check shows students the areas where they need to focus.

### UNIT 1 Polynomial and Rational Functions

**6–8 Weeks** | **30–40% AP Exam Weighting**

| Mathematical Practices | Topics |
|---|---|
| 2, 3 * | **1.1** Change in Tandem |
| 2, 3 | **1.2** Rates of Change |
| 3 | **1.3** Rates of Change in Linear and Quadratic Functions |
| 2, 3 | **1.4** Polynomial Functions and Rates of Change |
| 1, 2 | **1.5** Polynomial Functions and Complex Zeros |
| 3 | **1.6** Polynomial Functions and End Behavior |
| 1, 3 | **1.7** Rational Functions and End Behavior |
| 1 | **1.8** Rational Functions and Zeros |
| 2 | **1.9** Rational Functions and Vertical Asymptotes |
| 3 | **1.10** Rational Functions and Holes |
| 1, 3 | **1.11** Equivalent Representations of Polynomial and Rational Expressions |
| 1, 3 | **1.12** Transformations of Functions |
| 2, 3 | **1.13** Function Model Selection and Assumption Articulation |
| 1, 3 | **1.14** Function Model Construction and Application |

**Progress Check Unit 1 Part 1: Topics 1.1–1.6**
**Multiple-choice: 18 questions**
**Free-response: 2 questions**

**Progress Check Unit 1 Part 2: Topics 1.7–1.14**
**Multiple-choice: 24 questions**
**Free-response: 2 questions**

### UNIT 2 Exponential and Logarithmic Functions

**6–9 Weeks** | **25–40% AP Exam Weighting**

| Mathematical Practices | Topics |
|---|---|
| 1, 3 | **2.1** Change in Arithmetic and Geometric Sequences |
| 1, 3 | **2.2** Change in Linear and Exponential Functions |
| 3 | **2.3** Exponential Functions |
| 1, 3 | **2.4** Exponential Function Manipulation |
| 1, 3 | **2.5** Exponential Function Context and Data Modeling |
| 2, 3 | **2.6** Competing Function Model Validation |
| 1, 2 | **2.7** Composition of Functions |
| 1, 2 | **2.8** Inverse Functions |
| 1 | **2.9** Logarithmic Expressions |
| 1, 2 | **2.10** Inverses of Exponential Functions |
| 3 | **2.11** Logarithmic Functions |
| 1, 3 | **2.12** Logarithmic Function Manipulation |
| 1 | **2.13** Exponential and Logarithmic Equations and Inequalities |
| 1, 3 | **2.14** Logarithmic Function Context and Data Modeling |
| 2, 3 | **2.15** Semi-log Plots |

**Progress Check Unit 2 Part 1: Topics 2.1–2.8**
**Multiple-choice: 24 questions**
**Free-response: 2 questions**

**Progress Check Unit 2 Part 2: Topics 2.9–2.15**
**Multiple-choice: 24 questions**
**Free-response: 2 questions**

* 2, 3 indicates that Mathematical Practices 2 and 3 are covered by Topic 1.1.

# COURSE AT A GLANCE (cont'd)

## UNIT 3 Trigonometric and Polar Functions

**7–10** Weeks | **30–35%** AP Exam Weighting

| Mathematical Practices | Topics |
|---|---|
| 2 3 | **3.1** Periodic Phenomena |
| 2 3 | **3.2** Sine, Cosine, and Tangent |
| 2 3 | **3.3** Sine and Cosine Function Values |
| 2 3 | **3.4** Sine and Cosine Function Graphs |
| 2 3 | **3.5** Sinusoidal Functions |
| 1 2 | **3.6** Sinusoidal Function Transformations |
| 1 3 | **3.7** Sinusoidal Function Context and Data Modeling |
| 2 3 | **3.8** The Tangent Function |
| 1 2 | **3.9** Inverse Trigonometric Functions |
| 1 2 3 | **3.10** Trigonometric Equations and Inequalities |
| 2 3 | **3.11** The Secant, Cosecant, and Cotangent Functions |
| 1 3 | **3.12** Equivalent Representations of Trigonometric Functions |
| 1 2 | **3.13** Trigonometry and Polar Coordinates |
| 2 3 | **3.14** Polar Function Graphs |
| 3 | **3.15** Rates of Change in Polar Functions |

**Progress Check Unit 3 Part 1: Topics 3.1–3.7**
**Multiple-choice: 21 questions**
**Free-response: 2 questions**

**Progress Check Unit 3 Part 2: Topics 3.8–3.15**
**Multiple-choice: 24 questions**
**Free-response: 2 questions**

## UNIT 4 Functions Involving Parameters, Vectors, and Matrices

**7** Weeks | **0%** AP Exam Weighting

| Mathematical Practices | Topics |
|---|---|
| 1 2 | **4.1** Parametric Functions |
| 3 | **4.2** Parametric Functions Modeling Planar Motion |
| 3 | **4.3** Parametric Functions and Rates of Change |
| 1 | **4.4** Parametrically Defined Circles and Lines |
| 2 3 | **4.5** Implicitly Defined Functions |
| 1 2 | **4.6** Conic Sections |
| 1 2 | **4.7** Parametrization of Implicitly Defined Functions |
| 2 3 | **4.8** Vectors |
| 3 | **4.9** Vector-Valued Functions |
| 1 3 | **4.10** Matrices |
| 1 3 | **4.11** The Inverse and Determinant of a Matrix |
| 1 | **4.12** Linear Transformations and Matrices |
| 1 2 3 | **4.13** Matrices as Functions |
| 1 3 | **4.14** Matrices Modeling Contexts |

**Progress Check Unit 4 Part 1: Topics 4.1–4.7**
**Multiple-choice: 24 questions**
**Free-response: 2 questions**

**Progress Check Unit 4 Part 2: Topics 4.8–4.14**
**Multiple-choice: 21 questions**
**Free-response: 2 questions**