In AP Calculus AB, students learn to understand change geometrically and visually (by studying graphs of curves), analytically (by studying and working with mathematical formulas), numerically (by seeing patterns in sets of numbers), and verbally. Instead of simply getting the right answer, students learn to evaluate the soundness of proposed solutions and to apply mathematical reasoning to real-world models. Calculus helps scientists, engineers, and financial analysts understand the complex relationships behind real-world phenomena. The equivalent of an introductory college-level calculus course, AP Calculus AB prepares students for the AP exam and further studies in science, engineering, and mathematics.

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Length: Two semesters

## UNIT 1: PRECALCULUS REVIEW

## UNIT 2: BRIDGE TO CALCULUS

### LESSON 1: INTRO TO CALCULUS

**Study: What Is Calculus?**
Explore calculus as the mathematical study of change, which can help us understand and model change in our world. See some specific examples of uses for calculus.
Duration: 0 hrs 30 mins

**Practice: What Is Calculus?**
Explore calculus as the mathematical study of change, which can help us understand and model change in our world. See some specific examples of uses for calculus.
Duration: 0 hrs 30 mins    Scoring: 0 points

**Discuss: Introductions**
Before exploring the details of calculus, discuss its definition with your classmates.
Duration: 0 hrs 30 mins    Scoring: 10 points

### LESSON 2: FUNCTIONS

**Study: Functions**
Explore the concepts of domain, range, zeros (roots) of a function, and asymptotes, including the idea that a function gives a unique value for a given domain value.
Duration: 0 hrs 30 mins

**Practice: Functions**
Explore the concepts of domain, range, zeros (roots) of a function, and asymptotes, including the idea that a function gives a unique value for a given domain value.
Duration: 0 hrs 30 mins

**Quiz: Asymptotes and Domain Restrictions**
Practice finding asymptotes and domain restrictions.
Duration: 0 hrs 45 mins    Scoring: 12 points

**Practice: How to Use Your Graphing Calculator**
Use your graphing calculator to graph a function to an arbitrary viewing window.
Duration: 1 hr

### Practice: Finding Zeroes with Your Graphing Calculator

Use your graphing calculator to find the zeroes of a function.

Duration: 0 hrs 45 mins

### Practice: Graphing Functions and Finding Roots

Graph various functions and find roots for those functions.

Duration: 1 hr

### Study: Functions From Functions 1

Learn about adding, subtracting, multiplying, and dividing functions to create new functions. Notice what happens to their domains.

Duration: 0 hrs 30 mins

### Practice: Functions From Functions 1

Learn about adding, subtracting, multiplying, and dividing functions to create new functions. Notice what happens to their domains.

Duration: 0 hrs 30 mins

### Practice: Exploring Functions With Your Graphing Calculator

Use your graphing calculator to explore combinations of functions.

Duration: 0 hrs 45 mins

### Study: Functions From Functions 2

Explore functions created from composites and inverses of other functions. Notice what happens to their domains.

Duration: 0 hrs 30 mins

### Practice: Functions From Functions 2

Explore functions created from composites and inverses of other functions. Notice what happens to their domains.

Duration: 0 hrs 30 mins

### Quiz: Finding Function Combinations

Practice finding functions that are combinations of other functions.

Duration: 1 hr  Scoring: 10 points

### Practice: Concepts in Functions

Answer questions and solve problems that relate the concepts covered in the study of functions.

Duration: 1 hr

## LESSON 3: GRAPHICAL SYMMETRY

### Study: Symmetry

Explore what symmetry is present in the cases of odd, even, and inverse functions. Look at ways to identify the various symmetry cases graphically and algebraically.

Duration: 0 hrs 30 mins

### Practice: Symmetry

Explore what symmetry is present in the cases of odd, even, and inverse functions. Look at ways to identify the various symmetry cases graphically and algebraically.

Duration: 0 hrs 30 mins

### Quiz: Symmetry of Equations

After determining the type of symmetry for various equations that may be given graphically, algebraically, or as a table of values, answer questions about symmetry.

Duration: 1 hr  Scoring: 11 points

### Practice: Writing Symmetrical Functions

Practice with functions by writing functions for situations and situations for functions.

Duration: 1 hr  Scoring: 25 points

## LESSON 4: PATTERNS IN GRAPHS: PARAMETERS

### Study: Families of Functions and Their Graphs

Explore how to use information about one graph to quickly draw the graphs of other, related functions.

Duration: 0 hrs 30 mins

### Practice: Families of Functions and Their Graphs

Explore how to use information about one graph to quickly draw the graphs of other, related functions.

Duration: 0 hrs 30 mins

### Practice: Exploring Shifting and Distorting Graphs

Use your graphing calculator to explore shifting and distorting graphs.

Duration: 0 hrs 45 mins

### Practice: Pattern Recognition

Work on pattern recognition for the various forms, and sharpen your skills with parameters and how they relate to families of functions.

Duration: 1 hr

## LESSON 5: BRIDGE TO CALCULUS WRAP-UP

### Review: Bridge to Calculus

Review your studies of functions, graphical symmetry, and patterns in graphs.

Duration: 5 hrs

### Test (CS): Bridge to Calculus

Take a 25-minute test, modeled after the AP Exam, covering the concepts of functions, graphical symmetry, and patterns in graphs.

Duration: 0 hrs 25 mins Scoring: 20 points

### Test (TS): Bridge to Calculus

Take a 35-minute test, modeled after the AP Exam, covering the concepts of functions, graphical symmetry, and patterns in graphs.

Duration: 0 hrs 35 mins Scoring: 30 points

# UNIT 3: LIMITS AND CONTINUITY

## LESSON 1: LIMITS AND CONTINUITY

### Discuss: Coming to Terms With Infinity

Discuss Zeno's paradox of Achilles and the tortoise (and maybe some other paradoxes) in preparation for studying the infinite.

Duration: 0 hrs 30 mins Scoring: 10 points

### Study: Limits of Functions

Explore how to estimate limits from graphs or tables of data.

Duration: 0 hrs 30 mins

### Practice: Limits of Functions

Explore how to estimate limits from graphs or tables of data.

Duration: 0 hrs 30 mins

### Quiz: Limits Practice

Answer questions about whether (and where!) limits exist.

Duration: 1 hr Scoring: 9 points

### Study: Determining Limits Analytically

Examine the basic properties of limits and how to calculate limits using algebra; explore the limits of functions that include trig functions.

Duration: 0 hrs 30 mins

### Practice: Determining Limits Analytically

Examine the basic properties of limits and how to calculate limits using algebra; explore the limits of functions that

include trig functions.

Duration: 0 hrs 30 mins

### Practice: Limits in Trigonometric Functions

Practice determining limits, including limits of trigonometric functions.

Duration: 0 hrs 45 mins

## LESSON 2: ASYMPTOTIC AND UNBOUNDED BEHAVIOR

### Study: Asymptotes as Limits

Examine asymptotes in terms of graphical behavior, and asymptotic behavior in terms of limits involving infinity.

Duration: 0 hrs 30 mins

### Practice: Asymptotes as Limits

Examine asymptotes in terms of graphical behavior, and asymptotic behavior in terms of limits involving infinity.

Duration: 0 hrs 30 mins

### Practice: Determining Graphs When Given Limits

Apply given information about limits, when determining graphs

Duration: 1 hr  Scoring: 25 points

### Study: Comparing Relative Magnitudes of Functions

See how relative magnitudes of functions can help you determine limits quickly.

Duration: 0 hrs 30 mins

### Practice: Comparing Relative Magnitudes of Functions

See how relative magnitudes of functions can help you determine limits quickly.

Duration: 0 hrs 30 mins

### Quiz: Limits

Practice calculating limits as x goes to infinity.

Duration: 1 hr  Scoring: 13 points

### Study: Limits That Do Not Exist

Learn about some nonexistent limits and the reasons for their nonexistence.

Duration: 0 hrs 30 mins

### Practice: Limits That Do Not Exist

Learn about some nonexistent limits and the reasons for their nonexistence.

Duration: 0 hrs 30 mins

### Discuss: Nonexistent Limits in Nature

Consider nonexistent limits in nature using a predator/prey model.

Duration: 1 hr  Scoring: 10 points

### Practice: Overview of Limits

Apply your knowledge of limits as you determine limits that require algebraic manipulation.

Duration: 1 hr

## LESSON 3: CONTINUOUS FUNCTIONS

### Study: Continuity

Explore the central idea of continuity (close values of the domain lead to close values of the range) and understand continuity in terms of limits.

Duration: 0 hrs 30 mins

### Practice: Continuity

Explore the central idea of continuity (close values of the domain lead to close values of the range) and understand continuity in terms of limits.

Duration: 0 hrs 30 mins

### Quiz: Domains of Continuity

Practice determining domains of continuity for functions, given either the graph or the algebraic expression (including asymptotes).

Duration: 0 hrs 30 mins Scoring: 11 points

### Practice: Continuity Problems

As you examine functions for discontinuities and examine their types, recognize the properties of functions that are important in describing functions.

Duration: 1 hr 15 mins Scoring: 25 points

### Study: The Intermediate Value Theorem and the Extreme Value Theorem

Explore the existence of absolute extrema of a continuous function on a closed interval [a,b] and the possible nonexistence on an open interval (a,b) look at geometric understanding of graphs of continuous functions.

Duration: 0 hrs 30 mins

### Practice: The Intermediate Value Theorem and the Extreme Value Theorem

Explore the existence of absolute extrema of a continuous function on a closed interval [a,b] and the possible nonexistence on an open interval (a,b) look at geometric understanding of graphs of continuous functions.

Duration: 0 hrs 30 mins

### Discuss: Unbounded Behavior and Continuity

Brainstorm solutions to problems that show the relationship between unbounded behavior and continuity. Respond to your classmates ideas.

Duration: 1 hr Scoring: 10 points

## LESSON 4: LIMITS AND CONTINUITY WRAP-UP

### Review: Limits and Continuity

Review your studies of limits and continuity.

Duration: 5 hrs

### Test (CS): Limits and Continuity

Take a 25-minute test, modeled after the AP Exam, covering the concepts of limits and asymptotes and continuity.

Duration: 0 hrs 25 mins Scoring: 20 points

### Test (TS): Limits and Continuity

Take a 35-minute test, modeled after the AP Exam, covering the concepts of limits and asymptotes and continuity.

Duration: 0 hrs 35 mins Scoring: 30 points

# UNIT 4: DERIVATIVES

## LESSON 1: DERIVATIVES AT A POINT

### Study: Rates of Change as Slopes and Limits

Examine approximate rate of change from graphs and tables of values, the tangent line to a curve at a point, and local linear approximation.

Duration: 0 hrs 30 mins

### Practice: Rates of Change as Slopes and Limits

Examine approximate rate of change from graphs and tables of values, the tangent line to a curve at a point, and local linear approximation.

Duration: 0 hrs 30 mins

### Quiz: Slope Estimates

Answer questions by estimating slope from graphs and tables of data. Find instantaneous rates of change by estimations.

Duration: 1 hr Scoring: 7 points

### Study: The Derivative at a Point

Examine the derivative defined as the limit of the difference quotient. See examples, including points at which there are vertical tangents and points at which there are no tangents.

Duration: 0 hrs 30 mins

### Practice: The Derivative at a Point

Examine the derivative defined as the limit of the difference quotient. See examples, including points at which there are vertical tangents and points at which there are no tangents.

Duration: 0 hrs 30 mins

### Practice: Practice Finding Slopes

Practice finding slopes using easy examples of limits, some using real-world examples.

Duration: 1 hr

### Practice: Use of nDeriv or d (differentiate)

Use nDeriv or d (differentiate) on your calculator to compute the derivative at a point.

Duration: 1 hr

### Quiz: nDeriv Examples

On real-world examples, use nDeriv on points to find slopes.

Duration: 1 hr Scoring: 9 points

### Study: The Derivative as a Function

Explore the use of the derivative as a function to find the original function's slope at any x value.

Duration: 0 hrs 30 mins

### Practice: The Derivative as a Function

Explore the use of the derivative as a function to find the original function's slope at any x value.

Duration: 0 hrs 30 mins

### Practice: Comparing Calculator Derivatives to Real Ones

Use the limit definition to find a function, then compare that to y2 = nDeriv(y1,x,x) (graphical analysis). Graph a function that you found using the limit and compare that to the calculator derivative graph y2 = nDeriv(y1,x,x)

Duration: 0 hrs 45 mins Scoring: 20 points

## LESSON 2: COMPUTING DERIVATIVES

### Discuss: Shortcut Rules

Create a shortcut to the derivative, and make suggestions to your classmates.

Duration: 1 hr Scoring: 10 points

### Study: Computing Derivatives

See basic shortcuts for finding derivatives of power functions and of sine and cosine functions.

Duration: 0 hrs 30 mins

### Practice: Computing Derivatives

See basic shortcuts for finding derivatives of power functions and of sine and cosine functions.

Duration: 0 hrs 30 mins

### Practice: Practice on Derivatives

Practice the power rule and simple trig derivatives. Find slopes and simple applications. Come up with the original function and answer some questions based on the derivative.

Duration: 1 hr

### Study: Derivatives of Sums, Products, and Quotients of Functions

See how to take derivatives of functions defined as a combination of other functions. The rule for doing this will help determine derivatives for all sorts of functions.

Duration: 0 hrs 30 mins

### Practice: Derivatives of Sums, Products, and Quotients of Functions

See how to take derivatives of functions defined as a combination of other functions. The rule for doing this will help determine derivatives for all sorts of functions.

Duration: 0 hrs 30 mins

**Quiz: Product and Quotient Rule Practice**

Answer questions using the product and quotient rules.

Duration: 1 hr  Scoring: 10 points

**Practice: Determining Slope**

Use the rules for finding derivatives to answer questions about curves.

Duration: 1 hr  Scoring: 20 points

## LESSON 3: DERIVATIVE AS A FUNCTION

**Discuss: Graphs of Derivatives**

Explore derivatives and their graphs.

Duration: 0 hrs 30 mins  Scoring: 10 points

**Study: Relating the Graph of a Function and Its Derivative**

Examine the corresponding characteristics of graphs of f and f". and the relationship between the increasing and decreasing behavior of f and the sign of f".

Duration: 0 hrs 30 mins

**Practice: Relating the Graph of a Function and Its Derivative**

Examine the corresponding characteristics of graphs of f and f". and the relationship between the increasing and decreasing behavior of f and the sign of f".

Duration: 0 hrs 30 mins

**Practice: Derivatives and Graphs**

Practice recognizing derivatives by looking at graphs.

Duration: 0 hrs 45 mins

**Study: The Relationship Between Continuity and Differentiability**

Explore the relationship between differentiability and continuity.

Duration: 0 hrs 30 mins

**Practice: The Relationship Between Continuity and Differentiability**

Explore the relationship between differentiability and continuity.

Duration: 0 hrs 30 mins

**Practice: More Exploration**

Answer questions while exploring the relationship between differentiability and continuity.

Duration: 1 hr  Scoring: 25 points

**Study: Theorems: Rolle and Mean Value**

Explore Rolle's Theorem and the Mean Value Theorem and their geometric consequences.

Duration: 0 hrs 30 mins

**Practice: Theorems: Rolle and Mean Value**

Explore Rolle's Theorem and the Mean Value Theorem and their geometric consequences.

Duration: 0 hrs 30 mins

**Practice: Mean Value Theorem**

Answer free-response questions by finding x values that satisfy the Mean Value Theorem and looking at situations that call for the Mean Value Theorem.

Duration: 1 hr 30 mins

## LESSON 4: HIGHER-ORDER DERIVATIVES

**Practice: Higher-Order Derivatives**

Explore patterns in sin/cos/-sin/-cos/sin. Look for patterns in higher-order derivatives; learn notation for showing the second, third, etc. derivatives.

Duration: 1 hr

**Quiz: Multiple Derivatives of Functions**

Practice finding some multiple derivatives of functions.

Duration: 1 hr Scoring: 10 points

### Study: The Second Derivative and Concavity

Explore the steps to find and use concavity. Examine the relationship between the concavity of f and the sign of f'', and points of inflection as places where concavity changes.

Duration: 0 hrs 30 mins

### Practice: The Second Derivative and Concavity

Explore the steps to find and use concavity. Examine the relationship between the concavity of f and the sign of f'', and points of inflection as places where concavity changes.

Duration: 0 hrs 30 mins

### Practice: Concavity

Practice finding and using concavity. This activity is mostly graphical and numerical, with only a few analytical cases.

Duration: 1 hr Scoring: 25 points

### Practice: Identifying Functions and Their Derivatives

Practice associating the features of a graph (a maximum or minimum point, an inflection point, an asymptote, uphill and downhill parts) with features on the graph of the derivative and the second derivative.

Duration: 0 hrs 45 mins

## LESSON 5: CHAIN RULE AND IMPLICIT DIFFERENTIATION

### Study: The Chain Rule

See when and how to use the Chain Rule to find derivatives of composite functions.

Duration: 0 hrs 30 mins

### Practice: The Chain Rule

See when and how to use the Chain Rule to find derivatives of composite functions.

Duration: 0 hrs 30 mins

### Practice: Chain Rule Practice

Practice with the Chain Rule in a couple of applications to see the relationship to units.

Duration: 1 hr 30 mins

### Practice: Finding the Slope of a Curve

Using algebra, find the slope of a curve at several places.

Duration: 1 hr Scoring: 20 points

### Study: Implicit Differentiation

Explore how to use a powerful tool, implicit differentiation, to find the slope of a curve that isn't a function.

Duration: 0 hrs 30 mins

### Practice: Implicit Differentiation

Explore how to use a powerful tool, implicit differentiation, to find the slope of a curve that isn't a function.

Duration: 0 hrs 30 mins

### Practice: Conic Sections

Answer questions using implicit differentiation. Practice using conic sections and new types of curves.

Duration: 1 hr 15 mins

## LESSON 6: DERIVATIVES WRAP-UP

### Review: Derivatives

Review your studies of derivatives, concavity, the Chain Rule, and implicit differentiation.

Duration: 5 hrs

### Test (CS): Derivatives

Take a 25-minute test, modeled after the AP Exam, covering the concepts of derivatives, concavity, the Chain Rule, and implicit differentiation.

Duration: 0 hrs 25 mins Scoring: 20 points

### Test (TS): Derivatives

Take a 35-minute test, modeled after the AP Exam, covering the concepts of derivatives, concavity, the Chain Rule, and implicit differentiation.

Duration: 0 hrs 35 mins Scoring: 30 points

## UNIT 5: RATES OF CHANGE

### LESSON 1: EXTREMA AND OPTIMIZATION

#### Practice: Maximums

Complete an experiment and come up with an answer for the question, "When can a continuous function have a maximum?"

Duration: 1 hr

#### Study: Extrema and Number Line Tests

Explore absolute (global) and relative (local) extrema, critical points, and the first derivative test.

Duration: 0 hrs 30 mins

#### Practice: Extrema and Number Line Tests

Explore absolute (global) and relative (local) extrema, critical points, and the first derivative test.

Duration: 0 hrs 30 mins

#### Quiz: Finding Extrema

Practice curve analysis using a combination of the first and second derivative tests.

Duration: 0 hrs 45 mins Scoring: 8 points

#### Practice: Work on Extrema

Work on extrema, answering free-response style questions similar to the kind posed on the AP Exam.

Duration: 1 hr

#### Discuss: Salsa Jars

Discuss your answer to a question about the best number of salsa jars to produce per run by minimizing storage and production costs.

Duration: 1 hr Scoring: 10 points

#### Study: Optimization

See how to identify variables in optimization situations, write functions representing specific situations, and solve various types of optimization problems.

Duration: 0 hrs 30 mins

#### Practice: Optimization

See how to identify variables in optimization situations, write functions representing specific situations, and solve various types of optimization problems.

Duration: 0 hrs 30 mins

#### Practice: Applied Optimizing

Answer questions about applied optimization problems.

Duration: 2 hrs Scoring: 30 points

### LESSON 2: TANGENT AND NORMAL LINES

#### Study: Tangent and Normal Lines

See how to find and use tangent and normal lines.

Duration: 0 hrs 30 mins

#### Practice: Tangent and Normal Lines

See how to find and use tangent and normal lines.

Duration: 0 hrs 30 mins

#### Quiz: Finding Tangent and Normal Lines

Practice finding tangent and normal lines using calculus to find the slopes.

Duration: 0 hrs 45 mins  Scoring: 4 points

### Practice: More Practice

Practice finding tangent and normal lines in slightly more difficult applications.

Duration: 1 hr

### Discuss: Approximation

Explain why theta is a good approximation for sin theta if theta is near zero. Discuss your explanation with your classmates.

Duration: 1 hr  Scoring: 10 points

### Study: Local Linearity and Tangent Line Approximation

Examine local linearity and tangent line approximation.

Duration: 0 hrs 30 mins

### Practice: Local Linearity and Tangent Line Approximation

Examine local linearity and tangent line approximation.

Duration: 0 hrs 30 mins

### Practice: Tangent Line Approximation

Answer questions by using the tangent line approximation.

Duration: 1 hr 30 mins  Scoring: 30 points

## LESSON 3: RATES OF CHANGE

### Study: Rates of Change as Derivatives

See how to recognize derivatives in real world situations. Explore translating verbal descriptions into math and vice versa.

Duration: 0 hrs 30 mins

### Practice: Rates of Change as Derivatives

See how to recognize derivatives in real world situations. Explore translating verbal descriptions into math and vice versa.

Duration: 0 hrs 30 mins

### Practice: Finding Rates of Changes

Practice recognizing rates, as ways to start breaking down related-rates problems.

Duration: 1 hr

### Discuss: Derivatives in the Real World

Research real-world mentions of a derivatives. Discuss your findings with your classmates.

Duration: 1 hr  Scoring: 10 points

## LESSON 4: RELATED RATES

### Study: Related Rates

Explore modeling related rates of change, such as how the change in the volume of water in a tank is related to the change in the depth of water in the tank.

Duration: 0 hrs 30 mins

### Practice: Related Rates

Explore modeling related rates of change, such as how the change in the volume of water in a tank is related to the change in the depth of water in the tank.

Duration: 0 hrs 30 mins

### Quiz: Practice Determining Rates

Practice determining rates of change for related variables.

Duration: 1 hr  Scoring: 4 points

### Practice: Related-Rates Problems

Solve complicated related-rates problems similar to those found on the AP Exam.

Duration: 1 hr 30 mins   Scoring: 30 points

### LESSON 5: RECTILINEAR MOTION

**Practice: Velocity and Acceleration**

Answer questions about velocity by first plotting position over time for a 20-minute car ride.

Duration: 1 hr

**Study: Rectilinear Motion**

Explore interpretation of the derivative as a rate of change in motion problem. Examine velocity, speed, and acceleration.

Duration: 0 hrs 30 mins

**Practice: Rectilinear Motion**

Explore interpretation of the derivative as a rate of change in motion problem. Examine velocity, speed, and acceleration.

Duration: 0 hrs 30 mins

**Quiz: Rectilinear Motion Problems**

Solve rectilinear motion problems, similar to the AP Exam questions.

Duration: 0 hrs 45 mins   Scoring: 6 points

**Practice: More Rectilinear Motion Problems**

Solve rectilinear motion problems, similar to the AP Exam free-response questions.

Duration: 1 hr

### LESSON 6: SEMESTER WRAP-UP

**Practice: Applications of the Derivative**

Answer free-response questions that tie together the concepts of basic calculus, limits and continuity, derivatives, and rates of change.

Duration: 2 hrs   Scoring: 40 points

**Review: Semester 1 Review**

Review the concepts of basic calculus, limits and continuity, derivatives, and rates of change in preparation for the Semester Final.

Duration: 7 hrs

**Exam: Semester Final**

Take a 50-minute Semester Final, modeled after the AP Exam, covering the concepts of basic calculus, limits and continuity, derivatives, and rates of change.

Duration: 0 hrs 50 mins   Scoring: 80 points

**Final Exam: Semester Final**

Take a 70-minute Semester Final, modeled after the AP Exam, covering the concepts of basic calculus, limits and continuity, derivatives, and rates of change.

Duration: 1 hr 10 mins   Scoring: 120 points

## UNIT 6: THE INTEGRAL AND THE FUNDAMENTAL THEOREM OF CALCULUS

### LESSON 1: AREA UNDER A CURVE

**Discuss: Derivatives**

Write about the derivative, and summarize and discuss what you've learned about derivatives.

Duration: 0 hrs 30 mins   Scoring: 10 points

**Practice: Analyzing Velocity and Distance in a Car Ride**

In this activity take a ride, record information, and then use your data to make discoveries about how math can be used to explore velocity and distance.

Duration: 1 hr

**Study: Area Under a Curve: Riemann Sums**

Explore how to use rectangles to estimate the area under a curve.

Duration: 0 hrs 30 mins

### Practice: Area Under a Curve: Riemann Sums

Explore how to use rectangles to estimate the area under a curve.

Duration: 0 hrs 30 mins

### Quiz: Practice Using Riemann Sums

Practice estimating areas under curves by computing various Riemann sums using left-hand endpoints, right-hand endpoints, and midpoints.

Duration: 1 hr  Scoring: 6 points

### Practice: Finding a Better Approximation of Area Under a Curve

Explore how to find a better approximation of area under a curve.

Duration: 0 hrs 45 mins  Scoring: 20 points

### Study: Numerical Approximations to Area

Examine an alternative to Riemann sums.

Duration: 0 hrs 30 mins

### Practice: Numerical Approximations to Area

Examine an alternative to Riemann sums.

Duration: 0 hrs 30 mins

### Quiz: An Alternative to Riemann Sums

Apply the trapezoid rule and see that in some cases the approximation is very good, and in other cases it contains a lot of error.

Duration: 1 hr  Scoring: 7 points

### Practice: Using Approximations to Area Under a Curve

Practice using approximations to area under a curve.

Duration: 1 hr

## LESSON 2: DEFINITE INTEGRALS

### Practice: What If You Take More Intervals?

Discover what happens if you take more intervals.

Duration: 1 hr

### Study: The Definite Integral

Look at how to determine the exact area under the curve. Evaluate some definite integrals by applying simple rules of geometry, and approximate some definite integrals numerically.

Duration: 0 hrs 30 mins

### Practice: The Definite Integral

Look at how to determine the exact area under the curve. Evaluate some definite integrals by applying simple rules of geometry, and approximate some definite integrals numerically.

Duration: 0 hrs 30 mins

### Quiz: Practice With the Definite Integral

Practice with the definition of the definite integral and its relationship to area under curves.

Duration: 0 hrs 45 mins  Scoring: 7 points

### Study: Properties of the Definite Integral

Definite integrals work like the areas in precalculus; they have similar algebraic properties when you combine them. This Tutorial examines the important properties of the definite integral.

Duration: 0 hrs 30 mins

### Practice: Properties of the Definite Integral

Definite integrals work like the areas in precalculus; they have similar algebraic properties when you combine them. This Tutorial examines the important properties of the definite integral.

Duration: 0 hrs 30 mins

### Quiz: Practice With Properties of the Definite Integral

Practice combining and working with properties of definite integrals. Use the notion of definite integral as "signed area."

Duration: 0 hrs 45 mins Scoring: 9 points

### Practice: Finding the Value of a Definite Integral

Approximate definite integrals numerically.

Duration: 1 hr

### Quiz: Practice Using fnInt()or nInt()

Use your graphing calculator to approximate definite integrals.

Duration: 0 hrs 30 mins Scoring: 5 points

### Study: The Definite Integral as Accumulated Change

The definite integral is more than just the area under the curve. In this Tutorial you'll look at the definite integral as an "accumulator."

Duration: 0 hrs 30 mins

### Practice: The Definite Integral as Accumulated Change

The definite integral is more than just the area under the curve. In this Tutorial you'll look at the definite integral as an "accumulator."

Duration: 0 hrs 30 mins

### Practice: Practice With the Definite Integral as Accumulated Change

Exercise your understanding about the definite integral as an accumulator of change and about the idea of average value of a function.

Duration: 1 hr Scoring: 25 points

## LESSON 3: ANTIDERIVATIVES

### Discuss: Going Between Position, Velocity, and Acceleration

Given an equation for velocity, attempt to come up with an equation for position. And given an equation for acceleration attempt to come up with an equation for velocity.

Duration: 0 hrs 30 mins Scoring: 10 points

### Study: The Antiderivative

Study how, given a derivative, to find the "original" function.
Duration: 0 hrs 30 mins

### Practice: The Antiderivative

Study how, given a derivative, to find the "original" function.
Duration: 0 hrs 30 mins

### Quiz: Practice Finding Antiderivatives

Practice finding antiderivatives.
Duration: 1 hr Scoring: 11 points

### Study: Antiderivatives of Composite Functions

Examine how to find antiderivatives of composite functions.
Duration: 0 hrs 30 mins

### Practice: Antiderivatives of Composite Functions

Examine how to find antiderivatives of composite functions.
Duration: 0 hrs 30 mins

### Quiz: Practice Finding Antiderivatives of Composite Functions

Practice finding antiderivatives of composite functions.
Duration: 1 hr Scoring: 11 points

### Practice: Practice Finding Antiderivatives of Composite Functions

Apply your knowledge about finding antiderivatives of composite functions.

Duration: 1 hr

## LESSON 4: THE FUNDAMENTAL THEOREMS OF CALCULUS

### Practice: Exploring the Relationship Between the Derivative and the Antiderivative

In this activity, use your calculator to explore the relationship between the derivative and the antiderivative (or area function). See how the derivative and the antiderivative are related.

Duration: 0 hrs 30 mins Scoring: 20 points

### Study: The Fundamental Theorems of Calculus

Notice how the Fundamental Theorems of Calculus tie together into one neat package. Examine the shortcut for evaluating definite integrals exactly.

Duration: 0 hrs 30 mins

### Practice: The Fundamental Theorems of Calculus

Notice how the Fundamental Theorems of Calculus tie together into one neat package. Examine the shortcut for evaluating definite integrals exactly.

Duration: 0 hrs 30 mins

### Quiz: Practice Using the Fundamental Theorems

Develop a basic understanding of what the theorems mean and how to use them.

Duration: 0 hrs 45 mins Scoring: 10 points

### Study: Definite Integrals of Composite Functions

Apply the use of substitution to find antiderivatives to definite integrals and study about changing the limits of integration.

Duration: 0 hrs 30 mins

### Practice: Definite Integrals of Composite Functions

Apply the use of substitution to find antiderivatives to definite integrals and study about changing the limits of integration.

Duration: 0 hrs 30 mins

### Practice: Practice Using Substitution and the Fundamental Theorems

Practice using the method of substitution for evaluating definite integrals.

Duration: 1 hr

### Quiz: Terms and Concepts

Examine the subtleties of terms and concepts related to the Fundamental Theorems and integration.

Duration: 0 hrs 30 mins Scoring: 10 points

### Study: Analyzing Functions Defined as Definite Integrals

Look at some functions given as definite integrals, and explore how to do calculus with them.

Duration: 0 hrs 30 mins

### Practice: Analyzing Functions Defined as Definite Integrals

Look at some functions given as definite integrals, and explore how to do calculus with them.

Duration: 0 hrs 30 mins

### Practice: Practice Analyzing Functions Defined by Definite Integrals

Find derivatives at points, and apply multiple applications on functions given as definite integrals.

Duration: 1 hr Scoring: 30 points

## LESSON 5: THE INTEGRAL AND THE FUNDAMENTAL THEOREM OF CALCULUS WRAP-UP

### Review: The Integral and the Fundamental Theorem of Calculus

Review your studies of the area under a curve, definite integrals, antiderivatives, and the fundamental theorems of calculus.

Duration: 5 hrs

### Test (CS): The Integral and the Fundamental Theorem of Calculus

Take a 25-minute test covering the area under a curve, definite integrals, antiderivatives, and the fundamental theorems of calculus.

Duration: 0 hrs 25 mins Scoring: 20 points

### Test (TS): The Integral and the Fundamental Theorem of Calculus

Take a 35-minute test covering the area under a curve, definite integrals, antiderivatives, and the fundamental theorems of calculus.

Duration: 0 hrs 35 mins Scoring: 30 points

## UNIT 7: APPLICATIONS OF THE INTEGRAL

### LESSON 1: AREA

#### Study: Area Between Curves

See how to use the definite integral to determine the area of just about any shape that can be defined with equations in terms of x and y.

Duration: 0 hrs 30 mins

#### Practice: Area Between Curves

See how to use the definite integral to determine the area of just about any shape that can be defined with equations in terms of x and y.

Duration: 0 hrs 30 mins

#### Quiz: Practice Finding Area Between Curves

Practice finding area between curves.

Duration: 0 hrs 45 mins Scoring: 8 points

#### Study: More About Areas

See what else you can do with finding areas. Find areas in cases where there is no formula for the function, and analyze functions in cases where you're given an integral but not the original formula for the function.

Duration: 0 hrs 30 mins

#### Practice: More About Areas

See what else you can do with finding areas. Find areas in cases where there is no formula for the function, and analyze functions in cases where you're given an integral but not the original formula for the function.

Duration: 0 hrs 30 mins

#### Quiz: Practice Finding Domains for Given Areas

Work with the idea of the average value of a function. Some of the techniques will be the same as in the previous activity, where you found areas between curves.

Duration: 1 hr Scoring: 10 points

#### Practice: More Practice with Areas

Practice applying definite integrals. Work with qualitative questions (not heavy on numbers and calculation).

Duration: 1 hr 15 mins Scoring: 25 points

### LESSON 2: VOLUME

#### Discuss: Making a Solid

In this activity, construct a three-dimensional solid out of cardboard.

Duration: 1 hr Scoring: 10 points

#### Study: Volumes of Revolution

Examine three-dimensional shapes formed by rotating a curve and how to use the integral to find their volumes.

Duration: 0 hrs 30 mins

#### Practice: Volumes of Revolution

Examine three-dimensional shapes formed by rotating a curve and how to use the integral to find their volumes.

Duration: 0 hrs 30 mins

**Practice: Practice Working With Volumes of Revolution**

Find the volume of solids formed by rotating given regions around a certain line.

Duration: 1 hr

**Study: Other Cross Sections**

Investigate cross sections of solids.

Duration: 0 hrs 30 mins

**Practice: Other Cross Sections**

Investigate cross sections of solids.

Duration: 0 hrs 30 mins

**Practice: Practice With Many Kinds of Volumes**

Practice computing the volumes of solids whose cross sections are not circular or annular (washer-shaped).

Duration: 1 hr 30 mins Scoring: 25 points

## LESSON 3: OTHER APPLICATIONS OF THE DEFINITE INTEGRAL

**Practice: Rectilinear Motion**

Apply your knowledge of position, distance, velocity, speed, and acceleration in preparation for applying the definite integral to rectilinear motion (motion in a straight line).

Duration: 0 hrs 30 mins

**Study: Rectilinear Motion Revisited**

Use integrals to find net and total distances. Look at the distinction between speed and velocity, and see how these relate to the distinction between net and total distance.

Duration: 0 hrs 30 mins

**Practice: Rectilinear Motion Revisited**

Use integrals to find net and total distances. Look at the distinction between speed and velocity, and see how these relate to the distinction between net and total distance.

Duration: 0 hrs 30 mins

**Practice: Practice Finding Distances, Velocities, and Other Aspects of Rectilinear Motion**

Answer questions about the relationships between distance, velocity, and other aspects of rectilinear motion.

Duration: 1 hr

**Study: Other Applications of the Definite Integral**

Learn how these applications work in situations such as calculating arc length, work (force over a distance), and fluid pressure. Study about the connections between these applications.

Duration: 0 hrs 30 mins

**Practice: Other Applications of the Definite Integral**

Learn how these applications work in situations such as calculating arc length, work (force over a distance), and fluid pressure. Study about the connections between these applications.

Duration: 0 hrs 30 mins

**Quiz: Practice Using Definite Integrals**

Practice applying the definite integral. Underlying all these applications is the principle of accumulation.

Duration: 1 hr 15 mins Scoring: 9 points

**Practice: Practice Using Definite Integrals**

Practice applying the definite integral to situations involving accumulation of quantities.

Duration: 1 hr 30 mins Scoring: 30 points

**Quiz: Important Concepts From This Unit**

Review the meanings of some of the important terms and concepts in a series of qualitative (no math calculations) questions.

Duration: 1 hr 30 mins Scoring: 8 points

## LESSON 4: APPLICATIONS OF THE INTEGRAL WRAP-UP

### Review: Applications of the Integral

Review concepts of area, volume, and other applications of the definite integral.

Duration: 5 hrs

### Test (CS): Applications of the Integral

Take a 25-minute test covering various applications of the definite integral, including finding areas of regions and volume for solids and use the definite integral to solve problems of accumulation of change.

Duration: 0 hrs 25 mins  Scoring: 20 points

### Test (TS): Applications of the Integral

Take a 35-minute test covering various applications of the definite integral, including finding areas of regions and volume for solids and use the definite integral to solve problems of accumulation of change.

Duration: 0 hrs 35 mins  Scoring: 30 points

# UNIT 8: INVERSE AND TRANSCENDENTAL FUNCTIONS

## LESSON 1: INVERSE FUNCTIONS

### Study: Inverse Functions and Their Derivatives

Re-visit derivatives. Just as you may want to know how fast $y$ changes with respect to $x$, you may want to know how fast $x$ changes with respect to $y$.

Duration: 0 hrs 30 mins

### Practice: Inverse Functions and Their Derivatives

Re-visit derivatives. Just as you may want to know how fast $y$ changes with respect to $x$, you may want to know how fast $x$ changes with respect to $y$.

Duration: 0 hrs 30 mins

### Quiz: Derivatives of Inverse Functions

Practice finding derivatives of inverse functions.

Duration: 0 hrs 45 mins  Scoring: 10 points

### Study: Inverse Trigonometric Functions

Use implicit differentiation to find the derivatives of arctan($x$) and arccos($y$).

Duration: 0 hrs 30 mins

### Practice: Inverse Trigonometric Functions

Use implicit differentiation to find the derivatives of arctan($x$) and arccos($y$).

Duration: 0 hrs 30 mins

### Quiz: Use Inverse Trig Functions and Identify Their Domain Restrictions

Use inverse trigonometric functions, identify their domain restrictions, and find their derivatives.

Duration: 1 hr 30 mins  Scoring: 16 points

### Practice: Determine and Use Derivatives of Inverse Trig Functions

Determine and use derivatives of inverse trig functions.

Duration: 1 hr

## LESSON 2: REVIEW OF LOGARITHMIC AND EXPONENTIAL FUNCTIONS

### Discuss: What Makes Logarithms So Scary?

Discuss what makes logarithms so scary.

Duration: 0 hrs 30 mins  Scoring: 10 points

### Practice: Derivatives of Exponential Functions

In this activity, find the derivatives of some specific exponential functions by numerical exploration with your calculator.

Duration: 1 hr

### Study: Review of Exponential and Logarithmic Functions

Review some precalculus. It is important to understand the properties of these functions before working with

derivatives and integrals that involve them.

Duration: 0 hrs 30 mins

### Practice: Review of Exponential and Logarithmic Functions

Review some precalculus. It is important to understand the properties of these functions before working with derivatives and integrals that involve them.

Duration: 0 hrs 30 mins

### Quiz: Exponential and Logarithmic Functions

Practice with exponential and logarithmic functions.

Duration: 0 hrs 45 mins   Scoring: 16 points

## LESSON 3: COMPUTATION OF DERIVATIVES FOR SOME TRANSCENDENTAL FUNCTIONS

### Practice: What Is the Area Under 1/x?

In this activity, use your calculator as a tool to find the exact area under the curve $y = 1/x$.

Duration: 0 hrs 45 mins

### Study: Derivatives of Logarithmic and Exponential Functions

Learn how to take the derivatives of logs and exponentials, and learn a new technique for taking messy derivatives.

Duration: 0 hrs 30 mins

### Practice: Derivatives of Logarithmic and Exponential Functions

Learn how to take the derivatives of logs and exponentials, and learn a new technique for taking messy derivatives.

Duration: 0 hrs 30 mins

### Quiz: Derivatives of Logarithmic and Exponential Functions

Determine derivatives of logarithmic and exponential functions.

Duration: 0 hrs 45 mins   Scoring: 15 points

### Practice: Determine Derivatives of Logarithmic and Exponential Functions

Practice determining derivatives of logarithmic and exponential functions.

Duration: 1 hr

### Study: Analysis of Curves Involving Transcendental Functions

Revisit some applications of derivatives.

Duration: 0 hrs 30 mins

### Practice: Analysis of Curves Involving Transcendental Functions

Revisit some applications of derivatives.

Duration: 0 hrs 30 mins

### Quiz: Practicing Curve Analysis

Work on problems involving related rates, rectilinear motion, optimization, and curve analysis. Use multiple functions to describe the relationships in the problems.

Duration: 1 hr   Scoring: 8 points

### Practice: Analysis of Curves

Practice applying differentiation to problems involving transcendental functions.

Duration: 1 hr   Scoring: 25 points

### Study: L'Hospital's Rule

See how to use L'Hospital's rule to find limits of quotients.

Duration: 0 hrs 30 mins   Scoring: 0 points

### Practice: L'Hospital's Rule

Practice using L'Hospital's rule to find limits of quotients.

Duration: 0 hrs 30 mins   Scoring: 0 points

## LESSON 4: INTEGRALS OF SOME TRANSCENDENTAL FUNCTIONS

### Study: Integrating Transcendental Functions
Review the antiderivative rules for transcendental functions, and start using them to work with integrals.
Duration: 0 hrs 30 mins

### Practice: Integrating Transcendental Functions
Review the antiderivative rules for transcendental functions, and start using them to work with integrals.
Duration: 0 hrs 30 mins

### Quiz: Antiderivatives of Transcendental Functions
Practice finding antiderivatives involving transcendental functions.
Duration: 0 hrs 45 mins   Scoring: 11 points

### Practice: More Definite and Indefinite Integrals
Practice finding antiderivatives and definite integrals for the many types of functions covered in this course.
Duration: 1 hr

### Study: Applications of Integrals Using Transcendental Functions
Examine why the applications for the definite integral are valid.
Duration: 0 hrs 30 mins

### Practice: Applications of Integrals Using Transcendental Functions
Examine why the applications for the definite integral are valid.
Duration: 0 hrs 30 mins

### Practice: More Applications of Integrals
Find and use integrals for situations that include transcendental functions.
Duration: 1 hr   Scoring: 25 points

## LESSON 5: INVERSE AND TRANSCENDENTAL FUNCTIONS WRAP-UP

### Review: Inverse and Transcendental Functions
Review concepts of logarithmic, exponential, inverse and transcendental functions, and computation of some transcendental functions.
Duration: 5 hrs

### Test (CS): Inverse and Transcendental Functions
Take a 25-minute test covering inverse and transcendental functions, including inverse trigonometric, exponential, and logarithmic functions, their derivatives and antiderivatives, and applications involving transcendental functions.
Duration: 0 hrs 25 mins   Scoring: 20 points

### Test (TS): Inverse and Transcendental Functions
Take a 35-minute test covering inverse and transcendental functions, including inverse trigonometric, exponential, and logarithmic functions, their derivatives and antiderivatives, and applications involving transcendental functions.
Duration: 0 hrs 35 mins   Scoring: 30 points

# UNIT 9: SEPARABLE DIFFERENTIAL EQUATIONS AND SLOPE FIELDS

## LESSON 1: SEPARABLE DIFFERENTIAL EQUATIONS

### Study: Differential Equations and Slope Fields
See how to graph a differential equation by visualizing a whole family of functions at once, using a slope field.
Duration: 0 hrs 30 mins

### Practice: Differential Equations and Slope Fields
See how to graph a differential equation by visualizing a whole family of functions at once, using a slope field.
Duration: 0 hrs 30 mins

### Quiz: Important Concepts From This Unit
Answer questions about differential equations, using a slope field, and prepare for a more in-depth treatment of differential equations.
Duration: 1 hr   Scoring: 9 points

### Study: Separable Differential Equations Used in Modeling

Study how to recognize a differential equation and how to solve some really simple differential equations used in modeling "real life" situations.

Duration: 0 hrs 30 mins

### Practice: Separable Differential Equations Used in Modeling

Study how to recognize a differential equation and how to solve some really simple differential equations used in modeling "real life" situations.

Duration: 1 hr 45 mins

### Quiz: Setting up and Solving Separable Differential Equations

Look at some of the steps involved in setting up and solving these equations.

Duration: 1 hr Scoring: 11 points

### Practice: Applications of Differential Equations

Practice modeling situations as differential equations, and solve those equations.

Duration: 1 hr 45 mins Scoring: 30 points

## LESSON 2: EXPONENTIAL GROWTH AND DECAY AND RELATED APPLICATIONS

### Study: Exponential Growth and Decay

Look closely at $dy/dt = ky$, one of the most important differential equations used in modeling where the rate of change depends upon the amount.

Duration: 0 hrs 30 mins

### Practice: Exponential Growth and Decay

Look closely at $dy/dt = ky$, one of the most important differential equations used in modeling where the rate of change depends upon the amount.

Duration: 0 hrs 30 mins

### Quiz: Solving Growth and Decay Problems

Practice recognizing and solving differential equations that lead to exponential growth and decay.

Duration: 1 hr Scoring: 10 points

### Study: More Applications of Differential Equations

Look at Newton's law of cooling, mixing problems, falling bodies with air resistance, and logistic growth curves.

Duration: 0 hrs 30 mins

### Practice: More Applications of Differential Equations

Look at Newton's law of cooling, mixing problems, falling bodies with air resistance, and logistic growth curves.

Duration: 0 hrs 30 mins

### Practice: More Applications of Exponential and Logarithmic Differential Equations

Practice using applications of exponential and logarithmic differential equations.

Duration: 1 hr 15 mins Scoring: 30 points

## LESSON 3: SEPARABLE DIFFERENTIAL EQUATIONS AND SLOPE FIELDS WRAP-UP

### Review: Separable Differential Equations

Review the concepts of separable differential equations and exponential growth and decay.

Duration: 5 hrs

### Test (CS): Separable Differential Equations and Slope Fields

Take a 25-minute test covering real-world problems with differential equations, differential equations leading to exponential growth and decay and solve separable differential equations.

Duration: 0 hrs 25 mins Scoring: 20 points

### Test (TS): Separable Differential Equations and Slope Fields

Take a 35-minute test covering real-world problems with differential equations, differential equations leading to exponential growth and decay and solve separable differential equations.

Duration: 0 hrs 35 mins Scoring: 30 points

# UNIT 10: AP EXAM REVIEW AND FINAL EXAM

## LESSON 1: CALCULUS AS A COHESIVE WHOLE

### Study: Strategies for Taking the AP Exam

What to do between now and the Exam, and how to handle yourself during the Exam. Study how AP Exam scores are calculated, and explore some additional strategies for answering Free-response questions.

Duration: 0 hrs 30 mins

### Practice: Strategies for Taking the AP Exam

What to do between now and the Exam, and how to handle yourself during the Exam. Study how AP Exam scores are calculated, and explore some additional strategies for answering Free-response questions.

Duration: 0 hrs 30 mins

### Practice: Calculus as a Cohesive Whole

Using the Fundamental Theorems of Calculus as a focus, complete a "Concept Map" and take notice of what's helped you see calculus as a cohesive whole.

Duration: 0 hrs 30 mins

### Discuss: Calculus as a Cohesive Whole

Write a short question in which the solution requires the test taker to tie concepts from different parts of the Calculus AB course. Also answer a question that has been provided.

Duration: 0 hrs 30 mins  Scoring: 10 points

### Practice: Goals for the AP Exam

Review the nine goals stated by the College Board for AP Calculus, using the goals as a framework for reviewing the course and reviewing for the Final Exam and for the AP Exam.

Duration: 0 hrs 40 mins  Scoring: 27 points

## LESSON 2: REVIEW OF TOPICS

### Quiz: AP-Style Multiple-Choice Questions, Part 1

Following an outline of the course, answer questions that review and combine concepts tested on the AP Exam.

Duration: 2 hrs  Scoring: 18 points

### Quiz: AP-Style Multiple-Choice Questions, Part 2

Following an outline of the course, answer questions that review and combine concepts tested on the AP Exam.

Duration: 2 hrs  Scoring: 22 points

### Practice: AP-Style Free-Response Questions

Answer AP-style Free-Response Questions.

Duration: 6 hrs  Scoring: 30 points

## LESSON 3: PRACTICE FINAL EXAMS

### Practice: Full Final Practice Exam

Time yourself as you practice for the Final Exam and the AP Exam by taking this ungraded test.

Duration: 3 hrs 20 mins

### Study: AP Free-Response Questions

Learn general strategies for answering AP free-response questions by learning to score the practice test that you did in the previous activity.

Duration: 0 hrs 30 mins

### Practice: AP Free-Response Questions

Learn general strategies for answering AP free-response questions by learning to score the practice test that you did in the previous activity.

Duration: 0 hrs 30 mins

### Practice: Scoring Your Practice Exam

Review calculus problem-solving techniques and review AP Exam-taking strategies by applying the AP scoring techniques.

Duration: 2 hrs Scoring: 30 points

### Practice: Self-Scored Practice Exam

Grade yourself on how well you did the scoring work, as well as how you did on the practice exam.

Duration: 4 hrs

### Discuss: Should You Take the AP Exam?

With your teacher and with other students in your class, discuss the pros and cons of taking the AP Exam.

Duration: 0 hrs 30 mins Scoring: 10 points

## LESSON 4: FINAL EXAM

### Exam: Final Exam

Take a simulation of an AP Exam.

Duration: 1 hr 40 mins Scoring: 45 points

### Final Exam: Final Exam

Take a simulation of an AP Exam.

Duration: 1 hr 30 mins Scoring: 55 points