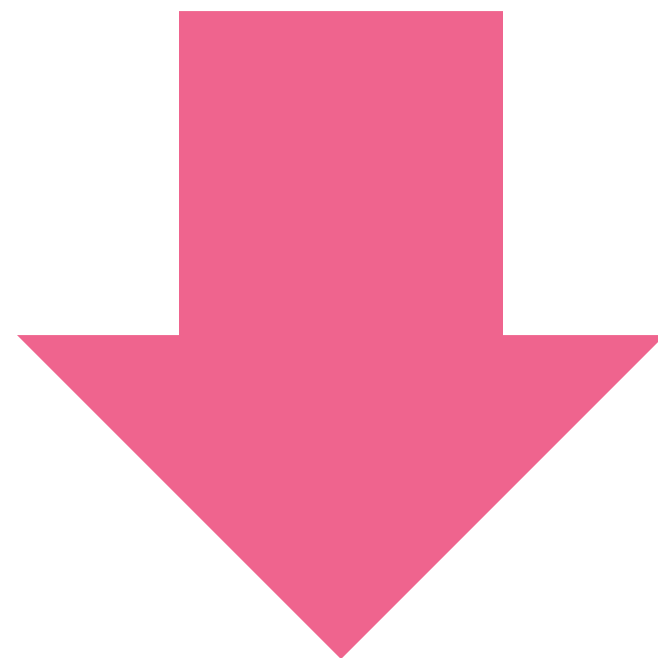


Are you searching for AP-Style Assessments?

All new editable assessments and so much more to save you time

Take a look inside!



AP[®] Calculus
Contextual Applications of the Derivative

Flamingo MATH
Jean Adams

Free Response

Calculator is REQUIRED on this portion of the test!

Weather Bots is a manufacturer of neoprene weather balloons. As the 350-gram spherical balloon is being inflated with hydrogen, the radius of the balloon, in feet, is modeled by a twice-differentiable function r , of time t , where t is measured in minutes. The table below gives selected values of the rate of change, $r'(t)$ for the radius of *Balloon A* over the time interval $0 < t < 10$.

t (minutes)	0	2	4	7	9	10
$r'(t)$ (feet per minute)	3.7	2.6	1.3	0.9	0.4	0.25

A. The radius of Balloon A is 5 feet when $t = 4$ minutes. Estimate the radius of the balloon when $t = 4.5$, using the tangent line approximation at $t = 4$. It is known that the graph of r is concave down on the time $0 < t < 10$. Is your approximation greater than or less than the true value?

Assessments 4

Completely Editable

Rigorous assessments aligned to course standards is here.

AP Calculus
Contextual Applications of Differentiation Test #4-A
Name _____
Calculator is NOT ALLOWED on this portion of the test!

1. The function C gives the cost (in dollars) to produce x gallons of fresh-squeezed lemonade. What is the best interpretation for the following statement?
The value of the derivative of C at $x = 10$ is equal to 1.15.
- A. At the time when 10 gallons of lemonade are produced, the costs increase by \$1.15.
B. When the amount of lemonade produced is 10 gallons, the cost is increasing at a rate of \$1.15 per gallon.
C. It costs \$1.15 to produce 10 gallons of lemonade.
D. The cost of producing the lemonade increases at a rate of \$1.15 per 10 gallons.

2. A manufacturer sells magnetic phone mounts for \$31,000, and the variable cost for producing x units is $P(x) = 24x + 31,000$. The function for manufacturing and selling the magnetic phone mounts is given by $P(x) = 20x - 31,000$.

3. The cost, C , of air conditioning your home, in dollars, is given by $C(T) = 0.005T^2 + 0.01T$, where T is the temperature in degrees Fahrenheit. Approximate the cost of air conditioning your home for $90^\circ\text{F} \leq T \leq 95^\circ\text{F}$, that is, $C(95)$.
- A. \$6.75 per day
C. \$2.25 per day

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Free Response
Calculator is REQUIRED on this portion of the test!

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- A. The radius of Balloon A is 5 feet when $t = 4$ minutes. Estimate the radius of the balloon when $t = 4.5$, using the tangent line approximation at $t = 4$. It is known that the graph of r is concave down for the time $0 < t < 10$. Is your approximation greater than or less than the true value?

4. A conical-shaped reservoir has a depth of 20 feet and a radius of 10 feet. Water is leaking out so that the surface is falling at the rate of $\frac{1}{2}$ ft/hr. Find the rate, in cubic feet per hour at which water is draining when the water is 8 feet deep. $V = \frac{1}{3}\pi r^2 h$

- A. $\frac{1}{4\pi}$
B. 4π
C. 8π
D. 16π

5. Let g be a differentiable function such that $g(4) = 5$ and $g'(4) = -2$. If the tangent line to the graph of g at $x = 4$ is used to find an approximation to a zero of g , that approximation is

- A. $x = 0$
B. $x = 13$
C. $x = 7$
D. $x = 6.5$

6. Given the implicit curve, $x^2 - \ln\left(\frac{x}{y}\right) = 1$, Write the linear approximation $L(x)$ of the tangent line at $(1,1)$.

- A. $y \approx L(x) = -x - 2$
B. $y \approx L(x) = -x + 2$
C. $y \approx L(x) = -x - 1$
D. $y \approx L(x) = -x + 1$

7. Find $\lim_{x \rightarrow 0} \frac{e^x - 1}{\tan x}$

- A. 1
B. 0
C. -1
D. does not exist

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Where do you find extra time to write AP-Style assessments?



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Flamingo Math by Jean Adams

WHAT IS INCLUDED?

AP CALCULUS AB
UNIT 4 REVIEW

Name _____

Important Topics:

- Interpreting the Derivative in Context to Real-World scenarios
- Straight Line Motion Connecting Position, Velocity and Acceleration
- Other Rates of Change
- Related Rates
- Linearization and Local Linearity
- L'Hospital's Rule

Interpreting the Derivative.

1. The population P , of *Infinityville* is recorded every year to monitor growth of the community, in thousands of new residents, since 2015. Write the statement for $P'(t)$ that represents the statement, "The population increased by 1,500 residents during 2019."
2. If $C = f(T)$ gives the cost, in dollars, to mine T -tons of limestone from a quarry, what is the meaning of the statement $f'(5000) = 285$?
3. A tropical storm passing through the Gulf of Mexico increases the rainfall along the coastline of Florida. Let $R = f(t)$ be the amount of rainfall, in inches, and t is the time in hours, where midnight is $t = 0$. Interpret the following, in context to the scenario and include units.
A. $f(6) = 1.57$
B. $f'(6) = 0.7$
C. $f^{-1}(9) = 12$
D. $[f^{-1}(9)]' = .75$

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Multiple Choice.

4. The position function of an object moving along the x -axis is given by $s(t) = t^3 + t^2 - 8t$ for $0 \leq t \leq 10$. For what values of t is the particle moving to the right?
A. $t > 0$
B. $t > \frac{4}{3}$
C. $0 < t < \frac{4}{3}$
D. $t < \frac{4}{3}$
5. Find a linear approximation to $f(x) = x^2 e^x$ at $x = 1$. Use the tangent line to estimate $x = 1.1$.
A. 8.156
B. 7.055
C. 3.534
D. 3.433
6. If $\pi(x) = 3x\sqrt{900 - x}$ gives the total profit π , to manufacture x units of a new sunscreen product. What is the maximum profit potential for the manufacturer?
A. \$31,176.91
B. \$32,176.78
C. \$60,000.00
D. \$32,000.00
7. $\lim_{x \rightarrow 0} (1 - 3x)^{\csc x}$
A. e^3
B. $-e^3$
C. does not exist
D. does not exist

7. If $f(x) = 2x^3 + 7$, then $\lim_{x \rightarrow 0} \frac{f(x) - f(0)}{x^3}$ is

- A. 0
C. 2



Editable Review assignments



Editable assessments



Full solution sets



Extra Practice Topics



Scope and Sequence

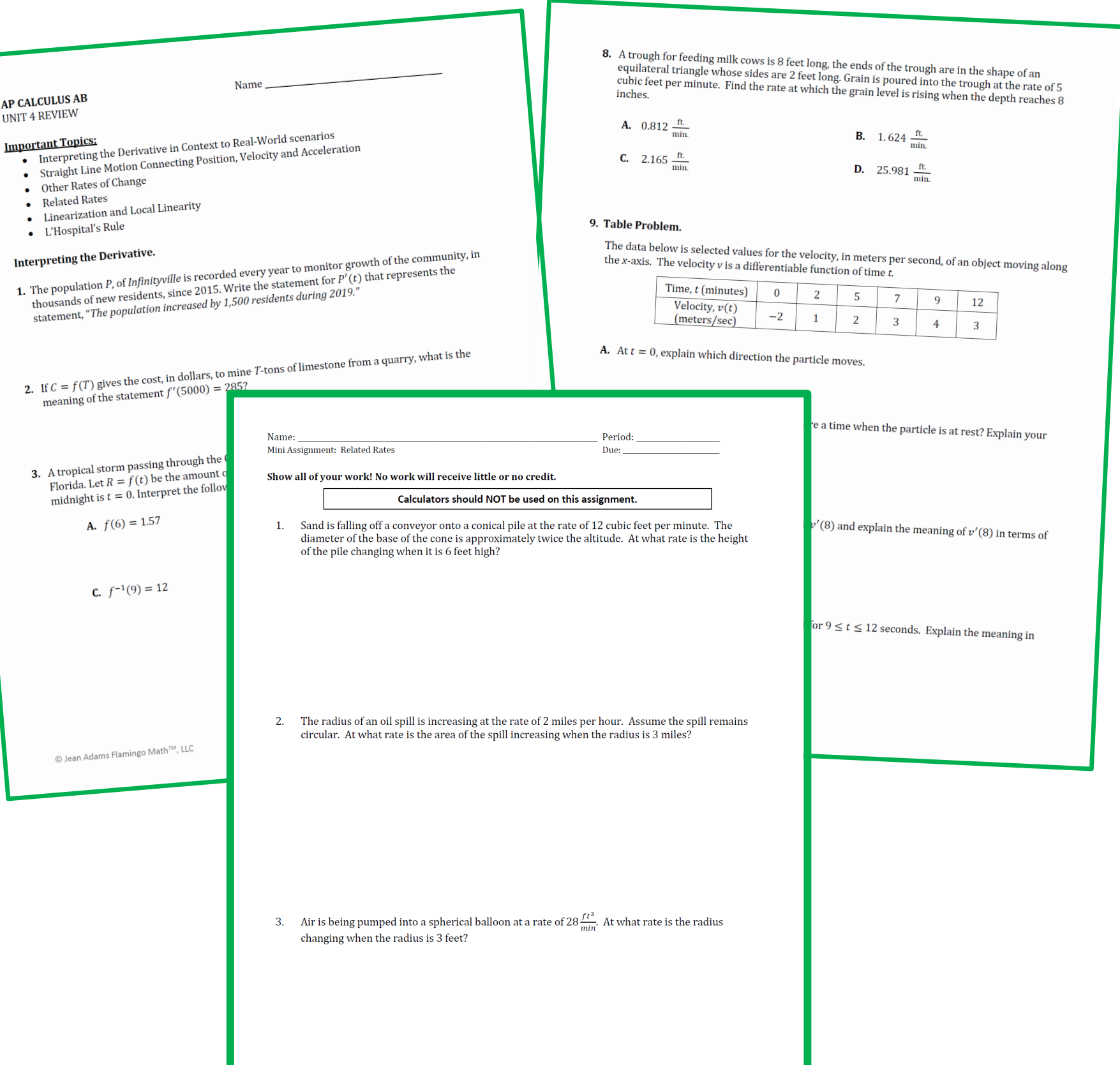
Cover the Standards

Each assessment will provide you and your students with the skills and learning objectives necessary for success in the AP Environment.

- ❑ You will find a scope and sequence document to track the learning objectives for the unit.
- ❑ Each quiz and test is available in two unique forms.
- ❑ You will also have a **fully-editable version** for every review, quiz and test to create extra assessment tools.
- ❑ A pacing guide for both AB and BC lessons and testing schedule.

AP CALCULUS CURRICULUM	
Scope and Sequence	
Unit 4: Contextual Applications of Differentiation	
Lesson	Skills & Learning Objectives
[4.1] Interpretations of the Derivative in Context	☐ Determine the meaning of a derivative as it relates to real-world scenarios
[4.2] Straight Line Motion: Connecting Position, Velocity & Acceleration	☐ Solve rectilinear motion problems involving speed, velocity and acceleration
[4.3] Rates of Change in Other Applications	☐ Apply the derivative to solve problems involving rates of change in applied contexts.
[4.4] Related Rates	☐ Calculate related rates in applied contexts ☐ Find a rate at which one quantity is changing by relating it to other quantities whose rates of change are known. ☐ Interpret related rates in applied contexts
[4.5] Local Linearity and Linearization	☐ Use tangent lines to approximate values near a point of tangency ☐ Determine whether a tangent line approximation overestimates or underestimates the corresponding function value
[4.6] L'Hospital's Rule	☐ Determine limits of functions that result in indeterminate forms.
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Early Reviews from Happy Teachers!



“ I love these assessments! They are rigorous and have multiple versions to use. *Michelle P.* ”

“ Very comprehensive! I like having the option of AP and non-AP assessments. *Abby M.* ”

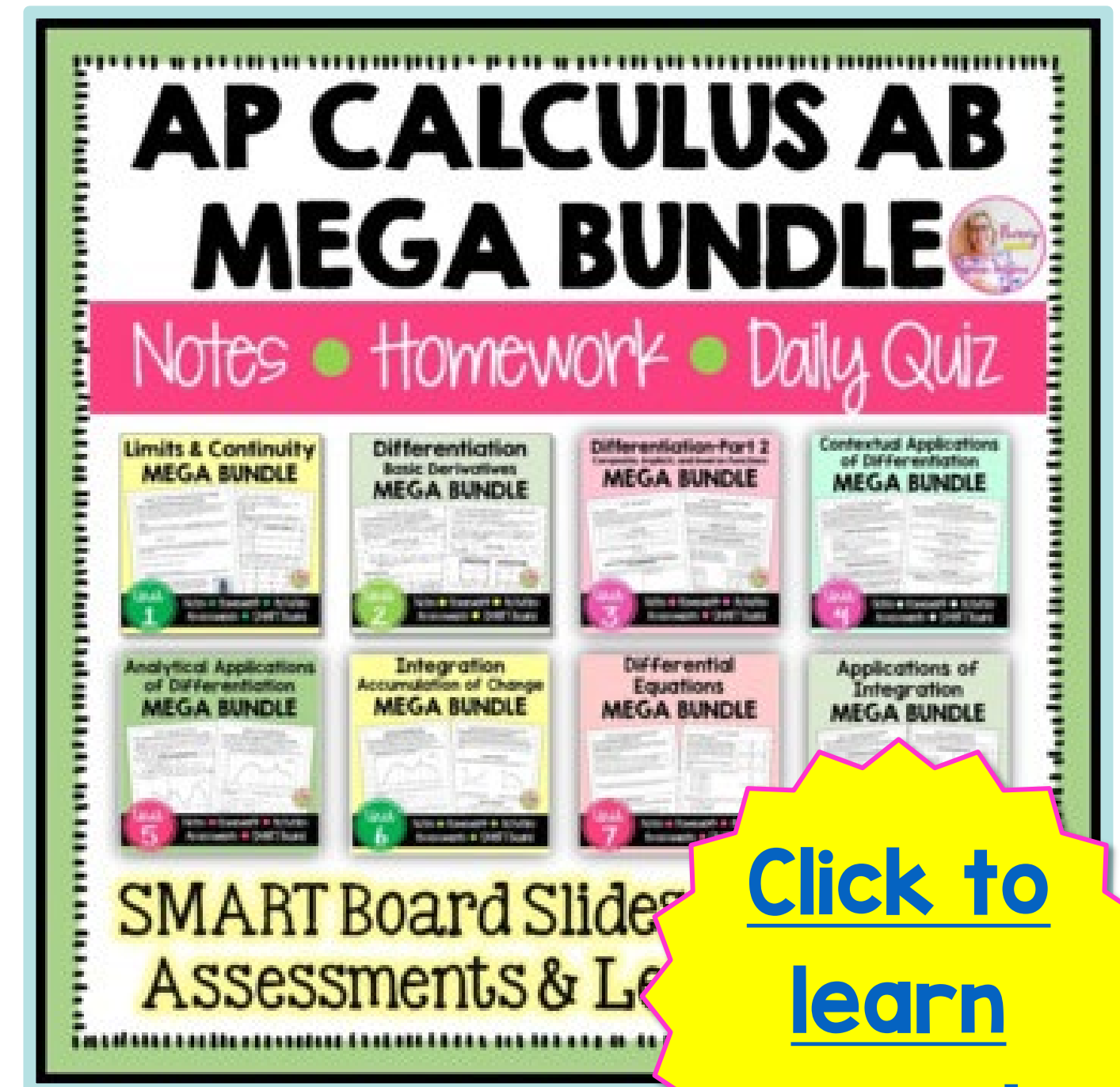
“ I love the way that you set up the test (AP Style) It is hard to find good assessments for the students. Your tests are a big help! *Monica B.* ”

Full Year Curriculum

The MEGA Bundle provides eight units for the entire AP Calculus AB course, including activities, video lessons, presentation tools, and so much more.

- Save over 20% when you purchase the full year curriculum bundle.
- Let Flamingo Math help you teach!

“Excellent resource to prepare for the AP Calc Exam. Just finished an AP workshop and am really impressed how aligned this bundle is for getting the Calculus taught. Thank you for all the hard work put into it. It's a fabulous resource. *Linda A.*”



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