

AP[®] Calculus

Derivatives & More



Thanksgiving Derivatives & More Name: _____

Circuit Style: Start your brain training in Cell #1, search for your answer. Label that block as Cell #2 and continue to work until you complete the entire exercise for your Derivatives Brain Training.

Cell #1: Answer: -150
 $\lim_{\theta \rightarrow 0} \frac{1 - \cos \theta}{2 \sin^2 \theta}$

Cell #2: Answer: $\frac{2x-3}{2x\sqrt{x}}$
 Find $\frac{dy}{dx}$ given: $y = \frac{3x+4}{4x+3}$

Cell #3: Answer: -4
 $f(x) = \begin{cases} \frac{\sqrt{2x+5} - \sqrt{x+7}}{x-2} & \text{for } x \neq 2, \\ f(2) = k \end{cases}$
 and if f is continuous at $x = 2$, then $k =$

Cell #4: Answer: $\frac{3}{4\sqrt{x}}$
 If $h(x) = (3f(x) + 4)(g(x) - 2)$, find the value for $h'(1)$.

x	f(x)	f'(x)	g(x)	g'(x)
1	5	-3	-2	3

Cell #5: Answer: $\frac{1}{8}$
 The function $h(x)$ is an increasing function. Use the table to find $[h^{-1}(4)]'$

x	h(x)	h'(x)
0	2	1/3
2	4	2/5
4	5	7/8

Cell #6: Answer: 216
 Find $\lim_{x \rightarrow 1} f(g(x+1))$

Cell #7: Answer: 93
 Find $\frac{dy}{dx}$ and simplify completely. given: $y^2 = x \cos y$

Cell #8: Answer: $-\frac{2}{9}$
 Given $f(x) = x^3 + 5x - 2$ and $g(x) = f^{-1}(x)$, find $g'(4)$.

Cell #9: Answer: $\frac{5}{2}$
 Let $f(x) = x \cdot \sqrt[3]{x}$. If $g(x)$ is the inverse of $f(x)$ find $g'(x)$.

Cell #10: Answer: 2
 $\lim_{x \rightarrow \infty} \frac{8x^2 - 3x + 4}{5x - 2x^2 + 7} =$

Cell #11: Answer: $\frac{-7}{(4x+3)^2}$
 Consider the curve in the xy -plane given by $x^2 + 6x + y^3 - 3y = -6$. Find the slope of the line tangent to the curve at $(-2, 2)$.

Cell #12: Answer: $\frac{3}{2}$
 If $k(x) = (2f(x) - 3)^3$, find $k'(3)$

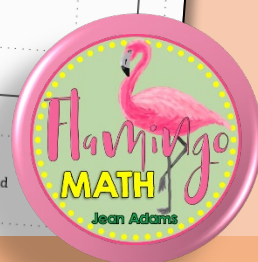
x	f(x)	f'(x)
3	4	-1

Cell #13: Answer: $\frac{1}{4}$
 If $f(x) = (2x + 1)^4$, then the 4th derivative of $f(x)$ at $x = 1$ is

Cell #14: Answer: $\frac{1}{6}$
 Find the derivative of $g(x) = \frac{2x+3}{\sqrt{x}}$

Cell #15: Answer: 93
 Find $\frac{dy}{dx}$ and simplify completely. given: $y^2 = x \cos y$

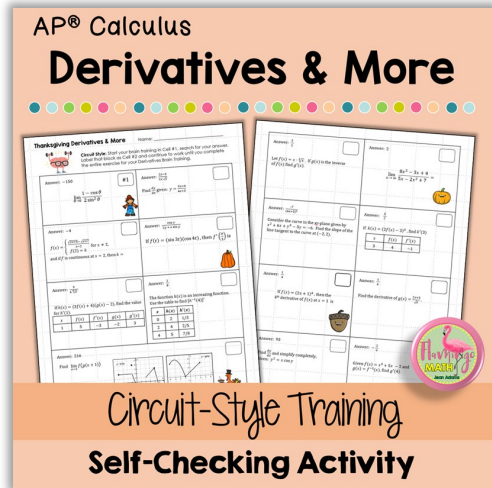
Cell #16: Answer: $-\frac{2}{9}$
 Given $f(x) = x^3 + 5x - 2$ and $g(x) = f^{-1}(x)$, find $g'(4)$.



Circuit-Style Training

Self-Checking Activity

Derivatives and More



KEY CONCEPTS/TOPICS:

1. Using Derivative Rules
2. Continuity and more

GENERAL DIRECTIONS:

Your AP Calculus students will have 15 self-checking question stems in a circuit-style training for derivative rules, continuity of functions, and more. Or choose an optional set of 16 Scavenger Hunt Task Cards.

About The Product

Derivatives & More

This resource is designed to help your students gain proficiency in their ability to find derivatives for units 2 and 3 in AP Calculus.

There are 15 or 16 question stems in two different formats:

1. As a self-checking circuit-style training there are 15 questions
2. As a Scavenger Hunt Task Card Set there are 16 questions

College Board® Topics:

Topic 2.4: Connecting Differentiability and Continuity

Topic 2.5: Applying the Power Rule

Topic 2.6 Derivative Rules: Constant, Sum, Difference, and Constant Multiple

Topic 2.7 Derivative Rules of cosine, sine, e^x and $\ln x$.

Topic 2.8: The Product Rule

Topic 2.9 The Quotient Rule

Topic 2.10 Derivatives of Tangent, Cotangent, Secant and/or Cosecant

Topic 3.1 The Chain Rule

Topic 3.2 Implicit Differentiation

Topic 3.3 Differentiating Invers Functions

Product Pages

www.FlamingoMath.com

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Answer: -150

#1 Answer: $\frac{2x-3}{2x\sqrt{x}}$

Find $\frac{dy}{dx}$ given: $y = \frac{3x^2-4}{4x^2+5}$

Answer: $\frac{\cos y}{2y + x \sin y}$

If $f(t) = (\sin 3t)(\cos 4t)$, then $f'(\frac{\pi}{3})$ is

Answer: $\frac{3}{4\sqrt{x}}$

If $h(x) = (3f(x) + 4)g(x) - 2$, find the value for $h'(1)$.

x	f(x)	f'(x)	g(x)	g'(x)
1	5	-3	3	9

Answer: 210

Find $\lim_{x \rightarrow 1} f(g(x+1))$

Answer: 93

Find $\frac{dy}{dx}$ and simplify completely. Given: $y^2 = x \cos y$

Answer: $\frac{1}{6}$

Find the derivative of $g(x) = \frac{2x+3}{\sqrt{x}}$

Answer: $-\frac{2}{9}$

Given $f(x) = x^3 + 5x - 2$ and $g(x) = f^{-1}(x)$, find $g'(4)$.

Derivatives and More Scavenger Hunt Name: _____ Date: _____ Period: _____

Pick any card to begin your Scavenger Hunt, find the solution on another card. This is your second question. Continue in the fashion until you complete the activity.

Answer: 2

Find $\lim_{x \rightarrow \infty} \frac{8x^2 - 3x + 4}{5x - 2x^2 + 7}$

Answer: $\frac{1}{2}$

If $k(x) = (2f(x) - 3)^3$, find $k'(3)$

x	f(x)	f'(x)
3	4	-1

Answer: $\frac{1}{6}$

Find the derivative of $g(x) = \frac{2x+3}{\sqrt{x}}$

Answer: $-\frac{2}{9}$

Given $f(x) = x^3 + 5x - 2$ and $g(x) = f^{-1}(x)$, find $g'(4)$.

Answer: 4

Find $\lim_{\theta \rightarrow 0} \frac{1 - \cos \theta}{2 \sin^2 \theta}$

Answer: $\frac{2x-3}{2x\sqrt{x}}$

Find $\frac{dy}{dx}$ given: $y = \frac{3x^2-4}{4x^2+5}$

Answer: $\frac{\cos y}{2y + x \sin y}$

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Answer: $-\frac{7}{(4x+3)^2}$

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Answer: $\frac{1}{4}$

If $f(x) = (2x+1)^4$, then the 4th derivative of $f(x)$ at $x = 1$ is

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Flamingo MATH Jean Adams