

AP Calculus AB - Product Rule, Quotient Rule and Trig Derivatives - Test

Common Core AP CALC AB 2.8, AP CALC AB 2.9, AP CALC AB 2.10 · maths-pdf.fr/en/

Name: _____ Class: _____ Date: ____/____/____

This test checks the product rule, the quotient rule and the derivatives of $\tan x$, $\cot x$, $\sec x$ and $\csc x$ (AP Calculus AB, 2.8, 2.9, 2.10). It has 8 questions worth 20 points in total. Allow 45 minutes, work without notes, and show all work, since justification earns points on the AP exam.

About this test

- Grade: AP Calculus AB
- Chapter: Product Rule, Quotient Rule and Trig Derivatives
- Standards: AP CALC AB 2.8, AP CALC AB 2.9, AP CALC AB 2.10
- Time: 45 minutes
- Total: 20 points

Question 1 - Product rule [2 pts]

Find $f'(x)$ for $f(x) = (x^2 + 3)e^x$.

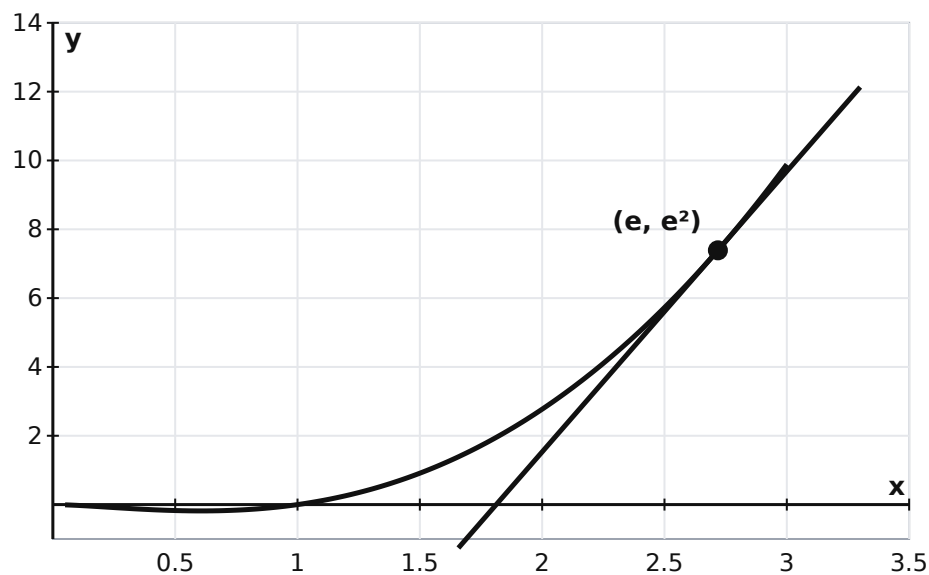
Question 2 - Quotient rule [3 pts]

Find $f'(x)$ for $f(x) = \frac{2x-1}{x+4}$.

Question 3 - Trig and product [2 pts]

Differentiate $g(x) = x \cos x + 3 \tan x$.

Question 4 - Tangent line [3 pts]



Graph of $f(x) = x^2 \ln x$.

Find the tangent line to $f(x) = x^2 \ln x$ at $x = e$.

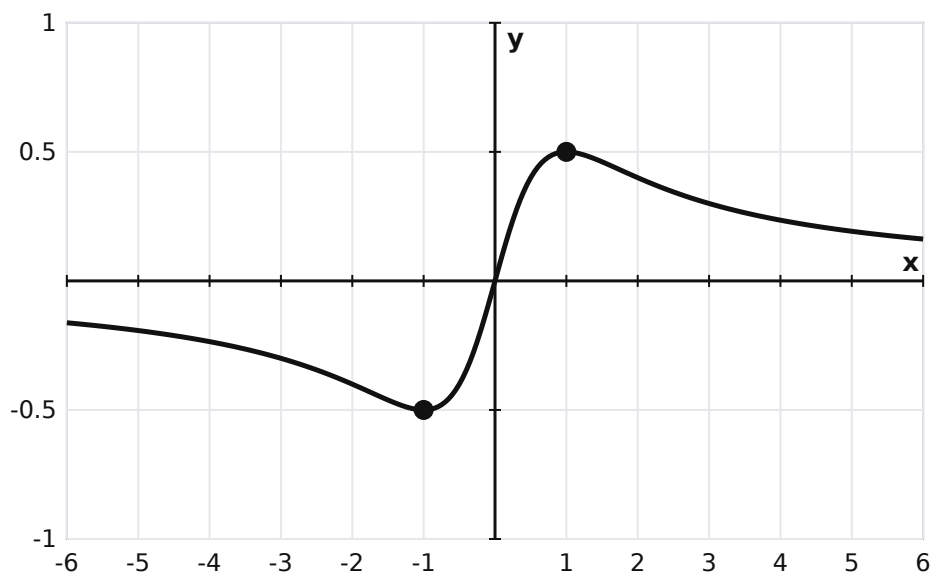
Question 5 - Table of values [2 pts]

$x = 1$	f	f'	g	g'
value	2	3	-1	4

Values at $x = 1$.

Given $f(1)=2$, $f'(1)=3$, $g(1)=-1$ and $g'(1)=4$, find $(fg)'(1)$ and $\left(\frac{f}{g}\right)'(1)$.

Question 6 - Horizontal tangents [3 pts]



Graph of $h(x) = x/(x^2 + 1)$.

Find the points where $h(x) = \frac{x}{x^2+1}$ has a horizontal tangent.

Question 7 - Rate of sales [3 pts]

A bakery sells $n(t) = 120 - 2t$ muffins a day at a price of $p(t) = 2 + 0.1t$ dollars, where t is days since a promotion began. (a) Write the revenue $R(t) = p(t)n(t)$. (1 point) (b) Find $R'(10)$. (2 points)

Question 8 - Secant and cosecant [2 pts]

Differentiate $k(x) = \sec x - 2\csc x$ and find $k'(\frac{\pi}{4})$.