

Calculus Test

Instructions

Answer all questions. Show all work clearly and neatly.

Part A: Derivatives

1. Compute the derivative of each of the following functions:
 - (a) $f(x) = 3x^2 - 2x + 1$
 - (b) $g(x) = \ln(x)$
 - (c) $h(x) = e^{2x} \ln(x)$
2. Find the equation of the tangent line to the curve $y = 2x^3 - x^2 + 3$ at the point where $x = 1$.
3. Determine the derivative of $y = \sin(2x) \cdot e^x$.
4. If $f(x) = \sqrt{x^2 + 1}$, find $f'(x)$ using the chain rule.