

Question 1

2024 | Prof. Stress

Calculate the derivative of the following function:

$$f(x) = \frac{\sqrt{x^2 + 1}}{e^{2x}}$$

“Strategy / Key Concepts”

Question 2

2024 | Dr. Scope

Given the equation $x^2 + y^2 = 25$, find

$$\frac{d}{dx}y$$

.

Instructions:

- Treat y as a function of x .
- Isolate y' .

“Strategy / Key Concepts”

Question 3

2023 | Prof. Long

Consider the following three statements:

1. If it rains, the ground is wet.
2. The ground is not wet.
3. Therefore, it did not rain.

Construct a truth table to determine if this argument is valid. Explain the difference between **Modus Ponens** and **Modus Tollens**.

“Strategy / Key Concepts”

Question 4

2020 | Old Professor

This question is from 2020. It should NOT appear if you filter for year: 2024.

“Strategy / Key Concepts”

Hints & Techniques

Question	Technique	Hint
1	Chain Rule	<p>Don't forget to use the Quotient Rule:</p> $\left(\frac{u}{v}\right)' = \frac{u'v - uv'}{v^2}$
2	Implicit Differentiation	<p>Remember that</p> $\frac{d}{dx}y^2$ <p>is $2yy'$.</p>
3	Truth Tables	This is an example of Modus Tollens .
4	Memorization	No hint needed.