0.1. “Question “, counter(“worksheet-q”).step()

#{q.year} | #{lecturer}

Calculate the derivative of the following function:

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

“Strategy / Key Concepts”

0.2. “Question “, counter(“worksheet-q”).step()

#{q.year} | #{lecturer}

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

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

.

Instructions:

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

“Strategy / Key Concepts”

0.3. “Question “, counter(“worksheet-q”).step()

#{q.year} | #{lecturer}

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”

0.4. “Question “, counter(“worksheet-q”).step()

#{q.year} | #{lecturer}

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