

Math 131 - Quiz 9

October 30, 2025

Name _____

Score _____

Show all work to receive credit. Supply explanations where necessary.

1. (3 points) Let $F(x) = \ln \left(\frac{x^4 e^{2x}}{(2x+5)^3} \right)$. Use the logarithm laws to expand $F(x)$. Then determine $F'(x)$.

2. (4 points) Determine each derivative.

(a) $\frac{d}{dx} e^{4x} \sin(2x)$

(b) $\frac{d}{dx} \ln(x + \sqrt{x})$

3. (3 points) Use logarithmic differentiation to find dy/dx when $y = x^{\sin x}$.