

Product and Quotient Rules

NAMES:

1. (3) Use the Product rule to find and simplify the derivative of $5e^{-3t}(3t^2 + 4t)$. [Your answer should be in the form of a trinomial (three terms) times e^{-3t} .]

2. (3) Use the Quotient rule to differentiate $\frac{4e^x + 2x}{3x^4 + 5x^{-2}}$. Just write the derivative as neatly and as accurately as you can. You are not required to simplify it.

3. (9) The amount (milligrams) of a certain drug in a human body x hours after it is administered is given by $f(x) = \frac{10x}{1 + .25x^2}$. Use calculus and the Quotient rule to answer the following questions.

a.) Find and simplify $f'(x)$.

b.) Find and interpret $f'(5)$.

c.) Graph $f(x) = \frac{10x}{1 + .25x^2}$ in the window $[0, 25] \times [0, 10]$. On the graph, indicate where the value $f'(5)$ is.