

Quiz 5 Solution

February 9, 2018

1. (4 points) Find the derivative of $f(t) = \frac{t^2 + 3t - 1}{t \cot t}$. You do not need to simplify your answer.

Solution: We use quotient rule:

$$\begin{aligned} f'(t) &= \frac{t \cot t \cdot \frac{d}{dt} [t^2 + 3t - 1] - (t^2 + 3t - 1) \cdot \frac{d}{dt} [t \cot t]}{(t \cot t)^2} \\ &= \frac{t \cot t \cdot (2t + 3) - (t^2 + 3t - 1) \cdot [1 \cdot \cot t + t \cdot \frac{d}{dt} [\cot t]]}{(t \cot t)^2} \\ &= \frac{t \cot t \cdot (2t + 3) - (t^2 + 3t - 1) (\cot t + t \cdot (-\csc^2 t))}{(t \cot t)^2} \end{aligned}$$

$$\textbf{Answer: } f'(t) = \frac{t \cot t (2t + 3) - (t^2 + 3t - 1) (\cot t - t \csc^2 t)}{(t \cot t)^2}$$

2. (1 point) What did you feel least prepared for on Exam 1?

Answer: Answers will vary.