

Name: ANSWERS

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MAT175 (Spring 2019)
Quiz 3

1. (10 pts) Compute the first derivative of the following function:

$$f(x) = \left(7 \tan(2x) + \frac{x+1}{e^x} + \sqrt{7} \right)^3$$

$$f'(x) = 3 \left(7 \tan(2x) + \frac{x+1}{e^x} + \sqrt{7} \right)^2 \left(7 \cdot \sec^2(2x) \cdot 2 + \frac{1 \cdot e^{-x} - (x+1)e^{-x}}{e^{2x}} \right)$$

$$= 3 \left(7 \tan(2x) + \frac{x+1}{e^x} + \sqrt{7} \right)^2 \left(14 \sec^2(2x) - \frac{x}{e^x} \right)$$

Extra details:

$$\uparrow$$

 $g(x)$

$$\uparrow$$

 $g'(x)$

Here we used the chain rule: $f(x) = g(x)^3$

where $g(x) = 7 \tan(2x) + \frac{x+1}{e^x} + \sqrt{7}$

So $\frac{d}{dx} f(g(x)) = f'(g(x)) \cdot g'(x) = 3g(x)^2 \cdot g'(x)$