

Quiz 7

September 21, 2016

Show all work and circle your final answer.

1. Find the derivative of $f(x) = e + ex + e^x + \frac{x}{e} + \frac{e}{x} + xe^x + x^e$

$$f(x) = e + ex + e^x + \frac{1}{e}(x) + ex^{-1} + xe^x + x^e$$

$$f'(x) = 0 + e + e^x + \frac{1}{e} - ex^{-2} + (xe^x + e^x) + ex^{e-1}$$

(Remember: e is a constant!)

2. Find $\frac{d}{dx} \left(\frac{1-x^3}{x^2+x} \right)$ using quotient rule. Do not simplify.

$$= \frac{(x^2+x) \left(\frac{d}{dx} (1-x^3) \right) - (1-x^3) \left(\frac{d}{dx} (x^2+x) \right)}{(x^2+x)^2} = \frac{(x^2+x)(-3x^2) - (1-x^3)(2x+1)}{(x^2+x)^2}$$

3. Find the point(s) on the curve $y = 9 + 2e^x + 3x$ where the tangent line is horizontal. $\rightarrow$ slope = 0

$$y' = 2e^x + 3 \stackrel{\text{set}}{=} 0$$

$$e^x = -3/2$$

$$\cancel{x = \ln(-3/2)} \quad \boxed{\text{DNE}}$$

(can't take $\ln$ of a number ≤ 0)