Math 201 Quiz 8A

October 16, 2019

Name: _____

Instructions: No calculators. Use your own scrap. Write your fully simplified answers in the space provided.

1. State the equations in the following rules:

   (a) Power rule: _____ (b) Product rule: _____

   (c) Quotient rule: _____ (d) Chain rule: _____

2. Assuming existence, state the equation that defines the derivative of $f(x)$: _____

3. Complete the following formulas, assume u is a function of x:

   (a) $\frac{d}{dx}a^u =$ _____ (b) $\frac{d}{dx}\ln u =$ _____ (c) $\frac{d}{dx}e^u =$ _____

   (d) $\frac{d}{dx}\sin x =$ _____ (e) $\frac{d}{dx}\cos x =$ _____ (f) $\frac{d}{dx}\log_a x =$ _____

4. Differentiate:

   (a) $\frac{d}{dx}xe^x =$ _____ (b) $\frac{d}{dx}\frac{x}{\ln x} =$ _____

   (c) $\frac{d}{dx}\cos(x^5 + e^x) =$ _____

   (d) $\frac{d}{dx}\left(e^{\ln\sqrt{5}} + \sin^2 x + \cos^2 x\right) =$ _____

Bonus:

1. Differentiate: $\frac{d}{dx}\tan x =$ _____

2. Differentiate: $\frac{d}{dx}\sin^2 x =$ _____

3. Differentiate: $\frac{d}{dx}\ln\sqrt{\frac{e^x x^3}{(x+1)^3}} =$ _____

4. If $x^2y^3 - 3x + 2y = \ln x + 1$, find $\frac{dy}{dx} =$ _____