Math 1203 Quiz 8
March 12, 2019

Name: _____

Instructions: No calculators! Answer <u>all</u> problems in the space provided! Do your rough work on scrap paper.

1. Complete the following rules, where they appear, c is a constant, f, g, u are differentiable functions:

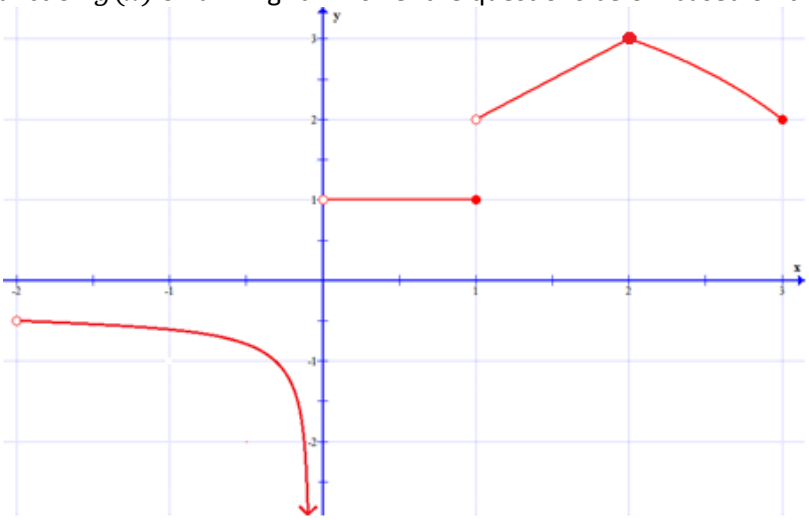
   (a) Define $f'(x) =$ _____ (using limits)

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

   (e) $\frac{d}{dx}(f \cdot g) =$ _____ (f) $\frac{d}{dx}\frac{f}{g} =$ _____

   (g) $\frac{d}{dx}f(g(x)) =$ _____

2. Below is the graph of a function $g(x)$ on a 1x1 grid. Answer the questions below based on the graph.



   (a) State the x-values for which the function is not continuous: $x =$ _____

   (b) State the x-values for where the derivative does not exist: $x =$ _____

3. Compute:

   (a) $\frac{d}{dx}\frac{3\sqrt{x}+2+x}{\sqrt{x}} =$ _____ (b) $\frac{d}{dx}x\ln x =$ _____

   (c) $\frac{d}{dx}\frac{e^x}{\ln x} =$ _____

Bonus:

1. Find $y' = \frac{dy}{dx}$:

(a) $x^2 + y^2 + 3xy = \ln y \quad \Rightarrow y' =$ _____

(b) $y = x^x \quad \Rightarrow y' =$ _____