Worksheet # 8 **Name:** _____
Date: 20/10/2021
Math 1A: Fall 2021

Problem 1

Find the linear approximation of the function $f(x) = \sqrt{1} - x,\ a = 0$ and use it to approximate the numbers $\sqrt{0.9}$ and $\sqrt{0.99}$.

Problem 2

Find the differential dy and evaluate dy for the given values of x and dx

1. $y = \cos \pi x,\ x = \frac{1}{3},\ dx = -0.02$
2. $y = \frac{x+1}{x-1},\ x == 2,\ dx = 0.05$

Problem 3

Use a linear approximation (or differentials) to estimate the given numbers

1. 1/4.002
2. $e^{0.1}$

Problem 4

Find the domain of the following functions and find their critical points

1. $f(x) = x^2 e^{-3x}$
2. $g(t) = |3t - 4|$
3. $h(p) = \frac{p^2}{p^2-4}$

Problem 5

Find the critical points of the following on their domains

1. $f(x) = x^{-2} \ln x,\ x \in [\frac{1}{2}, 4]$
2. $f(x) = x - 2\tan^{-1}(x),\ x \in [0, 4]$
3. $f(t) = t + \cot(\frac{t}{2}),\ x \in [\frac{\pi}{4}, \frac{7\pi}{4}]$