MATH-241 Calculus I
Midterm 01

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Spring 02/17/2022

Last name: Solution

First name: _____

Question:	1	2	3	4	5	6	7	8	Total
Points:	6	15	15	20	10	10	15	9	100
Score:									

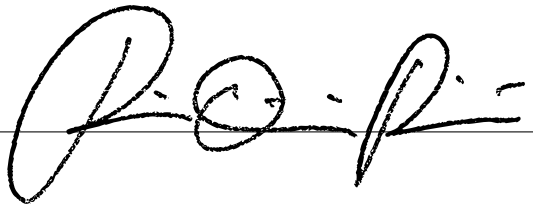
Instructions: Make sure to write your complete name on your copy. You must answer all the questions below and write your answers directly on the questionnaire. At the end of the 75 minutes, hand out your copy.

No devices such as a smart phone, cell phone, laptop, or tablet can be used during the exam. You are not allowed to use the lecture notes, the textbook, or any other notes. You may use a digital calculator (no graphical calculator or symbolic calculator will be allowed).

You must show ALL your work to have full credit. An answer without justification worth no point.

Good luck!

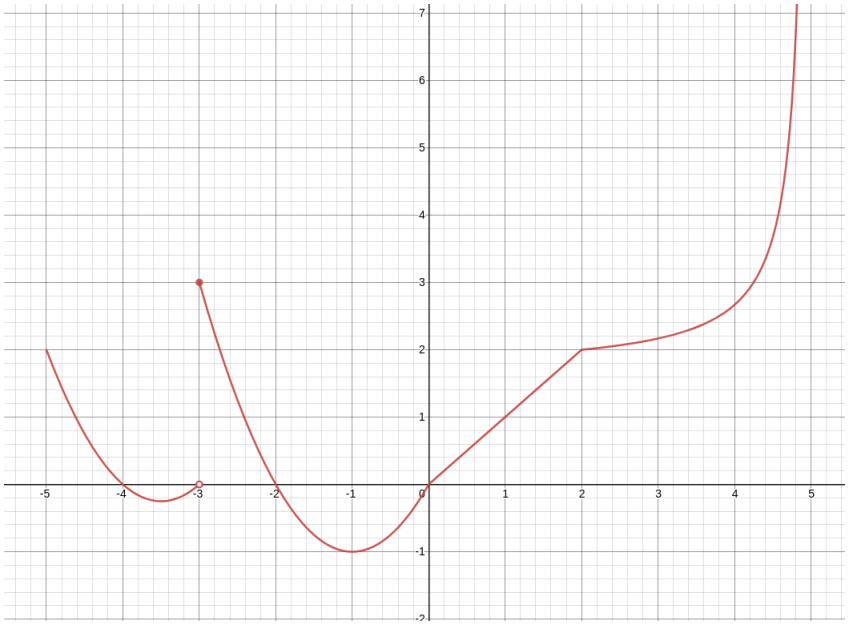
Pierre-Olivier Parisé

Your Signature: 

University of Hawai'i

Question 1 **(6 pts)**

Consider the function $f(x)$ with the graph $y = f(x)$ pictured below. The domain of f is $[-5, 5]$.



(a) (1 point) On which interval(s) (if any) is the function decreasing? (no justification needed)

$[-5, -3.5] \cup [-3, -1]$.

(b) (1 point) Where (if anywhere) is the function not continuous?

At $x = -3$ & $x = 5$

(c) (1 point) Where (if anywhere) is the function not differentiable?

at $x = -5$, $x = -3$, $x = 0$, $x = 2$ & $x = 5$.

(d) (1 point) What is $\lim_{x \to -3^-} f(x)$?

it is 0 .

(e) (1 point) What is $\lim_{x \to 5^-} f(x)$?

It is $+\infty$.

(f) (1 point) What is $\lim_{x \to 2^-} \dfrac{f(x) - f(2)}{x - 2}$? $\rightarrow \lim_{x \to 2^-} \dfrac{f(x) - f(2)}{x - 2} = 1$.

$\dfrac{f(x) - f(2)}{x - 2}$ is the slope of the line segment which is 1 for any x .