

Math 201 Quiz 5A

September 23, 2019

Name: _____

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

1. Using an equation, define what it means for a function $f(x)$ to be *continuous* at $x = a$:

2. What does it mean to say $f(x)$ is *continuous*?

3. Name the six kinds of *elementary continuous functions*:

4. State where the following are continuous. Use interval notation.

(a) $f(x) = \ln(x^2 - 1)$ _____ (b) $g(x) = \frac{3x+1}{\sqrt{5+x} - \sqrt{4-x}}$ _____

5. Find the value(s) of a and b that make the function $f(x) = \begin{cases} \frac{x^2-1}{x-1} & \text{if } x < 1 \\ ax^2 + bx + 2 & \text{if } 1 \leq x < 2 \\ 2x - a + b & \text{if } x \geq 2 \end{cases}$ continuous.

$a =$ _____ $b =$ _____

If there are no such a and b , state "N/A" for each of the above two slots.

Bonus:

1. Consider the function $f(x) = x - \cos x$

(a) Compute $f(0) =$ _____ and $f(2) =$ _____

(b) Does the equation $f(x) = 0$ have at least one solution? (Yes/no) _____

(c) How do you know? _____