

# Math 201 Quiz 3B

September 9, 2019

Name: ANSWERS

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

1. Complete the following rules:

(a)  $x^a \cdot x^b = x^{a+b}$  (b)  $(x^a)^b = x^{ab}$  (c)  $\log_a(x^n) = n \log_a x$   
 (d)  $\log_a(xy) = \log_a x + \log_a y$  (e)  $\log_a 0 = \text{undefined}$  (f)  $\log_a 1 = 0$   
 (g)  $x^{a/b} = \sqrt[b]{x^a}$  or  $\sqrt[b]{x^a}$  (h)  $\log_a b = c$  means  $a^c = b$   
 (i)  $a^{-x} = \frac{1}{a^x}$  (j)  $\log_a a^x = x$

2. True or false:  $\log_a(x - y) = \log_a x - \log_a y$  F

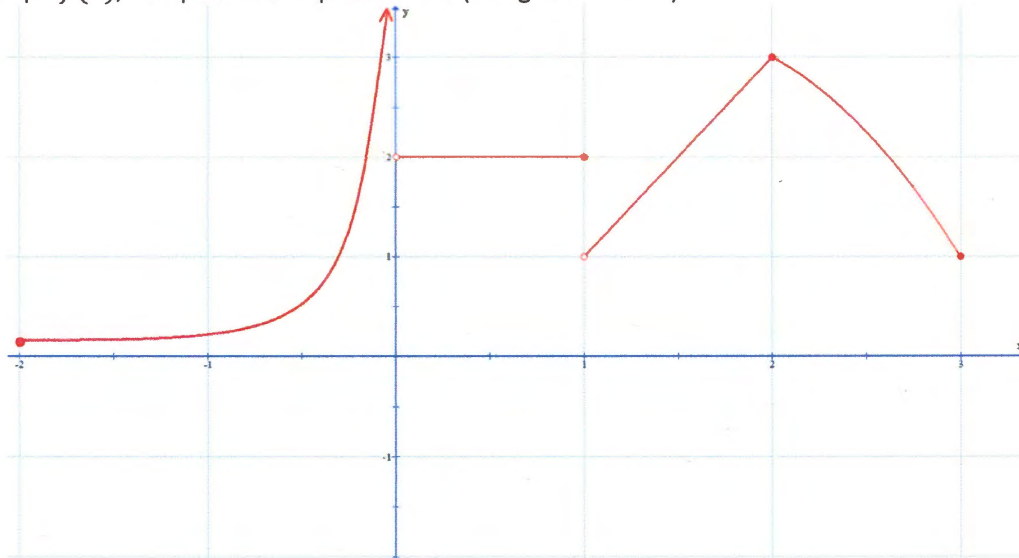
3. Expand and simplify:  $\ln\left(\frac{e^7 \sqrt{ab^3}}{c^5}\right) = 7 + \frac{1}{2} \ln a + \frac{3}{2} \ln b - 5 \ln c$

4. Simplify:  $e^{3 \ln \sqrt{9} - 2 \ln x} = \frac{27}{x^2}$

5. Solve the following equations:

(a)  $2e^{4x+1} = 6 \Rightarrow x = \frac{1}{4}(\ln 3 - 1)$  (b)  $\ln \sqrt{x-1} = 2 \Rightarrow x = e^4 + 1$

6. Given the graph  $f(x)$ , compute the required limits (1x1 grid is shown):



(a)  $\lim_{x \rightarrow -1/2} f(x) = 2$  (b)  $\lim_{x \rightarrow 1} f(x) = \text{DNE}$  (c)  $\lim_{x \rightarrow 2} f(x) = 3$

Bonus: (You must attempt all problems above to be eligible)

1. Compute: (a)  $\lim_{x \rightarrow -1} \frac{x-1}{x^2+1} = -1$  (b)  $\lim_{x \rightarrow 0} \frac{\tan x}{x} = 1$  (c)  $\lim_{x \rightarrow 3} \frac{x+3}{9-x^2} = \text{DNE}$