Name: Solutions

Math 1300-005 - Spring 2017

Quiz 2 - 1/27/17

On my honor, as a University of Colorado at Boulder student, I have neither given nor received unauthorized assistance on this work.

Signature: ______________________________

Guidelines: You are permitted to use notes, the book, in-class worksheets, and your classmates on this quiz. Computers and graphing technology of any kind, including calculators, are not allowed (exceptions made for those who have an e-book). Please show all work and clearly denote your answer.

1. Evaluate the following limits. Show all of your work to get credit. (Hint: simplify first)

(a) $\lim_{x\to -1} \frac{x^2-4x-5}{x+1} = \lim_{x\to -1} \frac{\cancel{(x+1)}(x-5)}{\cancel{(x+1)}}$

$= \lim_{x\to -1} (x-5)$

$= -1-5$

$\boxed{= -6}$

do not drop your limits!

(b) $\lim_{x\to 2} \frac{\sqrt{7+x}-3}{x-2} = \lim_{x\to 2} \frac{\sqrt{7+x}-3}{(x-2)} \cdot \frac{\sqrt{7+x}+3}{\sqrt{7+x}+3}$

$= \lim_{x\to 2} \frac{7+x-9}{(x-2)(\sqrt{7+x}+3)}$

$= \lim_{x\to 2} \frac{\cancel{x-2}}{\cancel{(x-2)}(\sqrt{7+x}+3)}$

$= \lim_{x\to 2} \frac{1}{\sqrt{7+x}+3}$

$= \frac{1}{\sqrt{9}+3} = \boxed{\frac{1}{6}}$

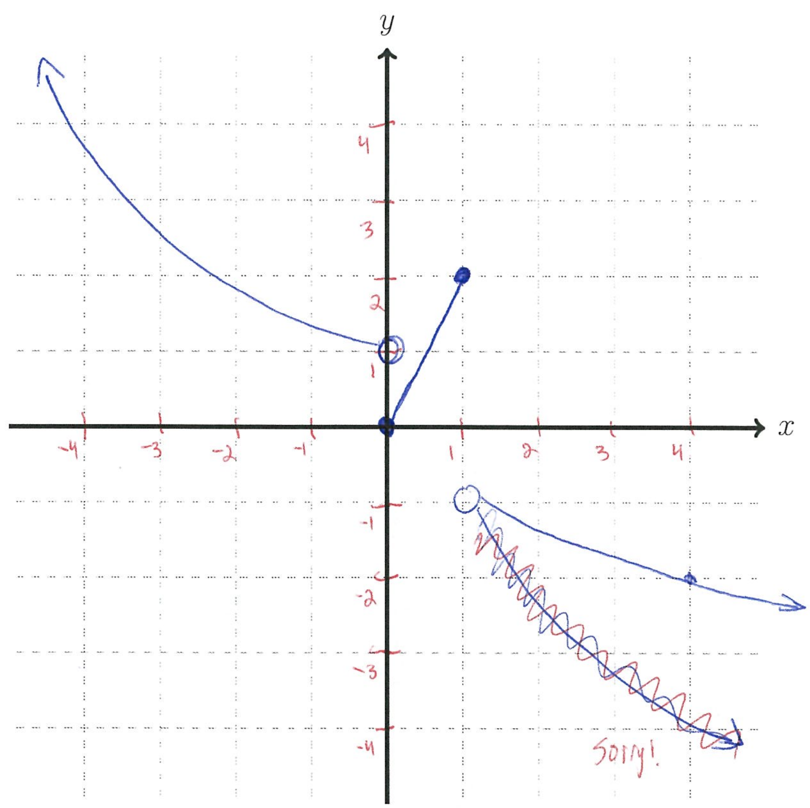
~~do~~ do not drop your limits!

2. Sketch the graph of the function and use it to determine the values of a for which

$$\lim_{x \to a} f(x)$$

does not exist.

$$f(x) = \begin{cases} e^{-x} & \text{if } x < 0 \\ 2x & \text{if } 0 \le x \le 1 \\ -\sqrt{x} & \text{if } x > 1. \end{cases}$$



At $a=0$, $\lim_{x \to 0^-} f(x) \neq \lim_{x \to 0^+} f(x)$, so $\lim_{x \to 0} f(x)$ DNE.

At $a=1$, $\lim_{x \to 1^-} f(x) \neq \lim_{x \to 1^+} f(x)$, so $\lim_{x \to 1} f(x)$ DNE.