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) $\lim_{x\to -1} \dfrac{x^2-4x-5}{x+1}$

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

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

$= -1-5$

$= -6$

do not drop your limits!

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

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

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

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

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

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

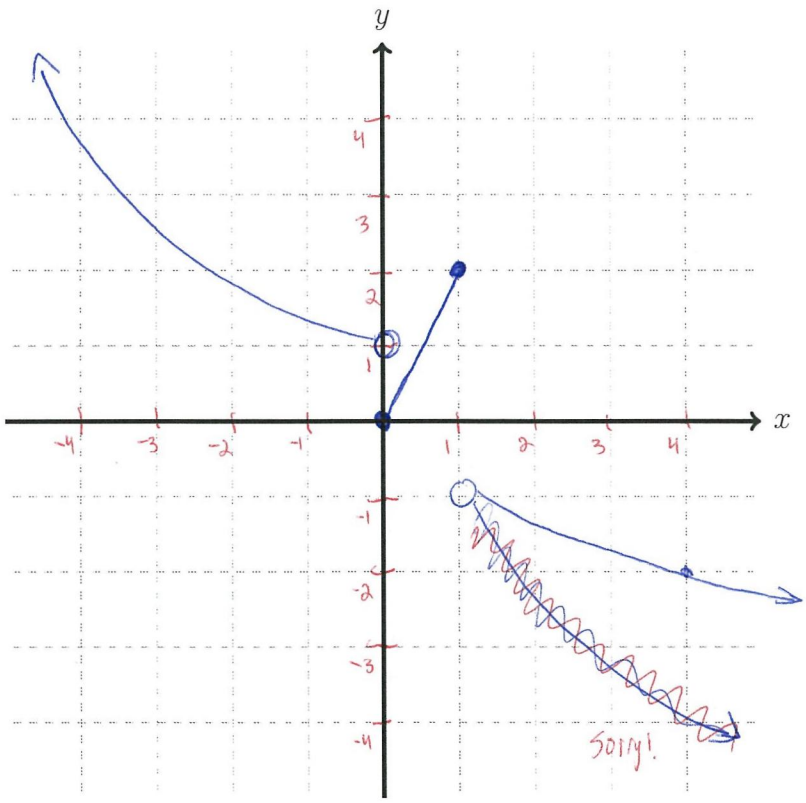
do not drop your limits!

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.

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




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.