Tajima HS Solis AP CALC BC

Continuity RETEACH

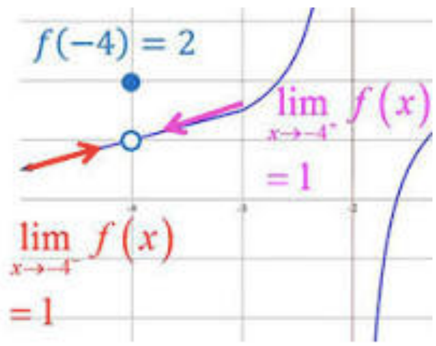
Name ______________________________ PER_____ DATE______________

DO NOW

Read the following passage about the conditions for a function to be continuous at some point, x = a. Then in your PRACTICE notebook, under the title "Continuity Reteach," restate the conditions in your own words.

In calculus, a function is continuous at x = a if - and only if - all three of the following conditions are met:

- The function is defined at x = a; that is, f(a) equals a real number.
- The limit of the function as x approaches a exists.
- The limit of the function as x approaches a is equal to the function value at x = a.



Prompt

Solve for the missing value in the problem below. Then, in at least two sentences, explain how you know that the missing value makes *f(x)* continuous.

$$f(x) = \begin{cases} \dfrac{(2x+1)(x-2)}{x-2} & \text{for } x \neq 2 \\ k & \text{for } x = 2 \end{cases}$$

9. Let f be the function defined above. For what value of k is f continuous at $x = 2$?

STUDENT A

(A) 0 (B) 1 (C) 2 (D) 3 (E) 5

① $f(2) = k$

② $\lim_{x\to 2^-} f(x) = 2(2)+1 = 5$

$\lim_{x\to 2^+} f(x) = 2(2)+1 = 5$

$\lim_{x\to 2} f(x) = 5$

③ Must be true!

$\lim_{x\to 2} f(x) = f(2)$

$5 = k$

The limit of f(x) as x approaches 2 is 5. In order for f(x) to be continuous @ x = 2, the limit found must equal f(2). Thus k = 5.

STUDENT B

$$f(x) = \begin{cases} \dfrac{(2x+1)\cancel{(x-2)}}{\cancel{x-2}} & \text{for } x \neq 2 \\ k & \text{for } x = 2 \end{cases} \rightarrow f(x) = \begin{cases} 2(2)+1 = 5 \\ \end{cases}$$

$\downarrow$

$\boxed{K=5}$

K=5 in order for f continuous at x=2 because if you plug in 2 into the first equation you get 5, which means the other expression should equal to 5.

In your PRACTICE notebook, still under 'Continuity Reteach,' answer the following questions in complete sentences. You do not have to copy the questions.

1. Which student applied the criteria for continuity in their response? What specific evidence led you to choose that student response?

2. What is the second student missing in their math work? What is the second student missing in their explanation?

3. Write a short message to Student B regarding his response to the exit slip and describe what he needs to strengthen his answer.