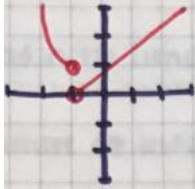


22/Agosto

# Corrections



a)  $\lim_{x \rightarrow -1^+} f(x) = 0$

c)  $\lim_{x \rightarrow -1} f(x) = \cancel{x}$

a)  $\lim_{x \rightarrow -4^+} f(x) = -2$

a)  $\lim_{x \rightarrow 4} f(x) = 2$

a)  $f(4) = \cancel{x}$

a)  $\lim_{x \rightarrow 25} \frac{(x-25)}{(\sqrt{x}-5)} = \frac{(\cancel{\sqrt{x}-5})(\sqrt{x}+5)}{\cancel{\sqrt{x}-5}}$   $y = \sqrt{25} + 5$   $\lim = 10$   
 $y = 5 + 5$   $x \rightarrow 25$   
 $y = 10$

b)  $\lim_{x \rightarrow 6} \frac{(x^2-36)}{(x-6)} = \frac{(x+6)(\cancel{x-6})}{\cancel{x-6}}$   $y = x+6$   $\lim = 12$   
 $y = 6+6$   $x \rightarrow 6$   
 $y = 12$

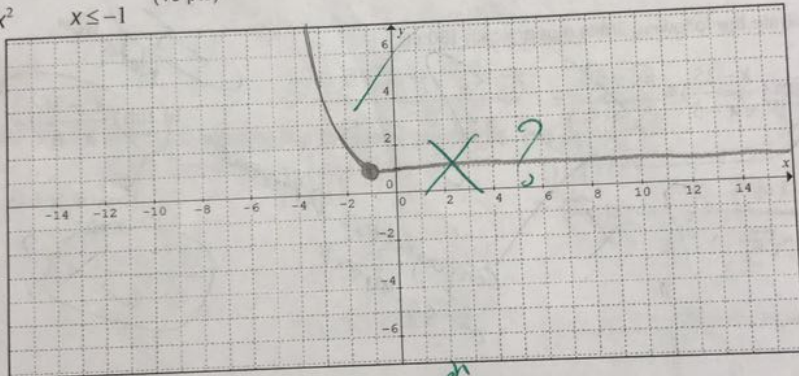
1. Estimate the given limit using a numerical approximation (15 pts)

|        |        |        |        |        |        |        |        |
|--------|--------|--------|--------|--------|--------|--------|--------|
| $x$    | -0.1   | -0.01  | -0.001 | 0      | 0.001  | 0.01   | 0.1    |
| $f(x)$ | .51316 | .50125 | .50012 | undef. | .49987 | .49875 | .48808 |

$\lim_{x \rightarrow 0} \frac{\sqrt{x+1}-1}{x} = .50$

2. Graph the following functions and find their limits. (15 pts)

$$f(x) = \begin{cases} x+1 & x > -1 \\ x^2 & x \leq -1 \end{cases}$$



Find (20 pts)

- a)  $\lim_{x \rightarrow 1^+} f(x) = \underline{2}$  ✓ *ok according to your graph.*  
 b)  $\lim_{x \rightarrow 1^-} f(x) = \underline{1}$  ✓  
 c)  $\lim_{x \rightarrow 1} f(x) = \underline{2}$  ✓  
 d)  $f(-1) = \underline{1}$  ✓

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Name CAROLINA SALAZAR G ID. A01530190

I. Write the letter of the correct answer on the line. (10 points each)

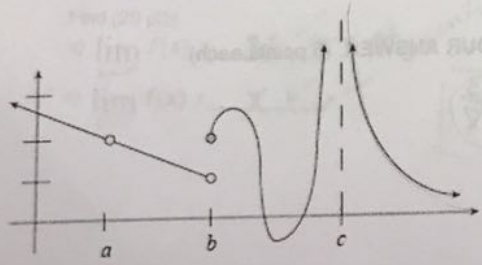
1. ~~A~~ <sup>C</sup> Find  $\lim_{x \rightarrow \infty} (6 + \frac{1}{x^2})$   
 A) 0 B)  $\infty$  C) 6 D) 1

2. ~~A~~ Use the following graph to determine  $\lim_{x \rightarrow \infty} f(x)$

A) 2 B) 1 C) 1.8  $\infty$  D) 0

3. ~~B~~ Find  $\lim_{x \rightarrow 3} \frac{1}{(x-3)^2}$   
 A)  $-\infty$  B)  $+\infty$  C) 0 D)  $\frac{1}{9}$

II. For the function  $f(x)$  whose graph is given, find the following limits (20 points)



a)  $\lim_{x \rightarrow +\infty} f(x) = \infty$

b)  $\lim_{x \rightarrow -\infty} f(x) = \infty$

c)  $\lim_{x \rightarrow c} f(x) = \infty$

d)  $\lim_{x \rightarrow b^-} f(x) = 1$

-15

**Instructions:** Solve the following exercises. Remember to write your solution procedure in an orderly fashion. (10 points each)

I. Find the following limits

1.  $\lim_{x \rightarrow -2} \frac{3x^2 + 4x - 4}{2x^2 + 3x - 2} =$

~~$\lim_{x \rightarrow -2} f(x) = \frac{3}{2}$~~  ? Procedure?

-10

2.  $\lim_{x \rightarrow 5} \frac{x^2 - 25}{x - 5} =$

~~$\frac{(x-5)(x+5)}{(x-5)}$~~   $f(x) = x+5$   $\lim_{x \rightarrow 5} f(x) = 10$

3.  $\lim_{x \rightarrow 3} \frac{x^2 + 14x + 33}{2x + 6} =$

~~$\frac{(x+3)(x+11)}{2(x+3)} = \frac{x+11}{2}$~~   $\lim_{x \rightarrow 3} f(x) = 7$

II. Graph an example of a function that satisfies the following conditions: (10 points)

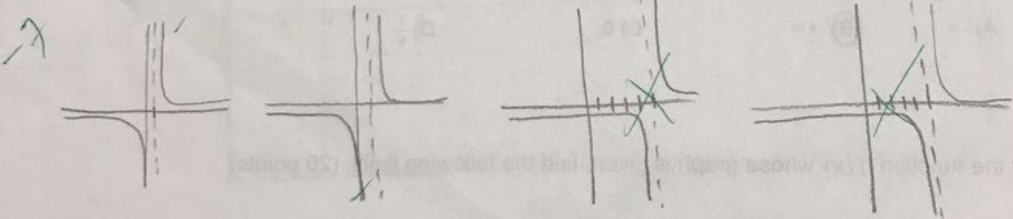
a)  $\lim_{x \rightarrow 1^+} f(x) = +\infty$

$\lim_{x \rightarrow 1^-} f(x) = -\infty$

$\lim_{x \rightarrow \infty} f(x) = 5$

$\lim_{x \rightarrow -\infty} f(x) = 5$

One graph with all.



III. Evaluate the following limits. JUSTIFY or EXPLAIN YOUR ANSWER. (5 points each)

a)  $\lim_{x \rightarrow \infty} \frac{5x - 3}{2x + 3} =$

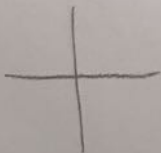
~~$\frac{2x-3}{x-2} = \lim_{x \rightarrow \infty} f(x) = -\frac{3}{2}$~~

3

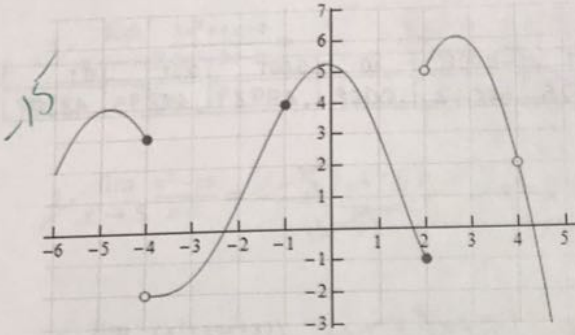
b)  $\lim_{x \rightarrow \infty} \frac{4x - 2}{x^2 + 5x} =$

why?

3



3. Based on the graph find the limits (20 pts)



a)  $\lim_{x \rightarrow 4^-} f(x) = -2$  ✓  
 b)  $\lim_{x \rightarrow 2} f(x) = -1$  ✓  
 c)  $\lim_{x \rightarrow 4} f(x) = \frac{1}{2}$  ✗  
 d)  $f(4) = 7$  ✗

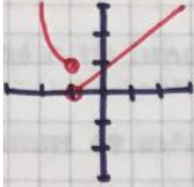
4. Evaluate the following limits algebraically (30 pts):

a)  $\lim_{x \rightarrow 25} \left( \frac{x-25}{\sqrt{x}-5} \right) = \frac{(x-25)}{(\sqrt{x}+5)} = \frac{x - \sqrt{25} + 125}{x - \sqrt{5x} - 25}$   
 $\frac{145}{\sqrt{5}} = 29\sqrt{5}$   
 Conjugates = Difference of squares

b)  $\lim_{x \rightarrow 6} \left( \frac{x^2-36}{x-6} \right) = \frac{(x-6)(x+6)}{x-6}$   
 $\lim_{x \rightarrow 6} x+6 = 6+6 = 12$   
 $\frac{12^2-36}{12-6} = 18$  ✗  
 $f(x) = 12$  ✓

22/Agosto

# Corrections



a)  $\lim_{x \rightarrow -1^+} f(x) = 0$

c)  $\lim_{x \rightarrow -1} f(x) = \exists$

a)  $\lim_{x \rightarrow -4^+} f(x) = -2$

c)  $\lim_{x \rightarrow 4} f(x) = 2$

a)  $f(4) = \exists$

a)  $\lim_{x \rightarrow 25} \left( \frac{x-25}{\sqrt{x}-5} \right) = \frac{(\sqrt{x}-5)(\sqrt{x}+5)}{\sqrt{x}-5}$

$y = \sqrt{25} + 5$   $\lim = 10$   
 $y = 5 + 5$   $x \rightarrow 25$   
 $y = 10$

b)  $\lim_{x \rightarrow 6} \left( \frac{x^2-36}{x-6} \right) = \frac{(x+6)(x-6)}{x-6}$

$y = x+6$   $\lim = 12$   
 $y = 6+6$   $x \rightarrow 6$   
 $y = 12$