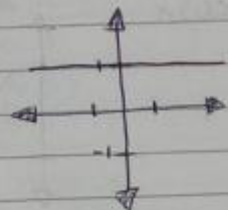
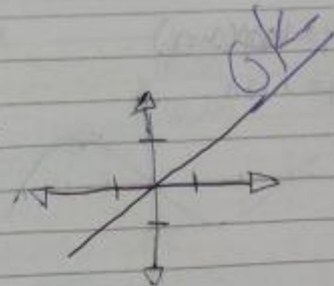
Roberto García A01570172
Fernando Ferreiro A01570336

GK

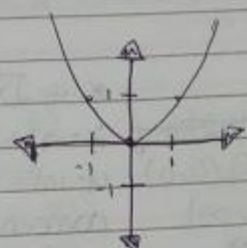
$y=C$



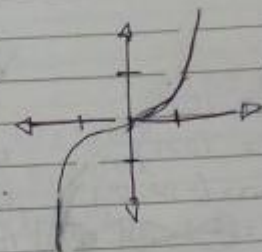
$y=X$



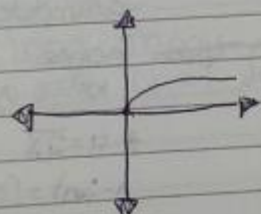
$y=x^2$



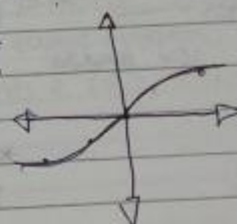
$y=x^3$



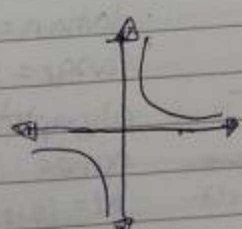
$y=\sqrt{X}$



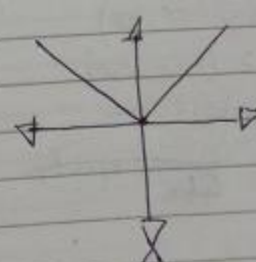
$y=\sqrt[3]{X}$



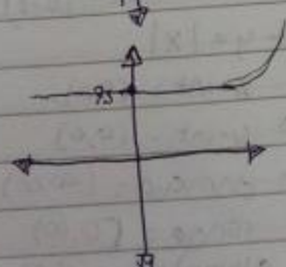
$y=\frac{1}{x}$



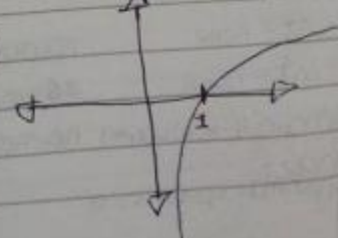
$y=|x|$



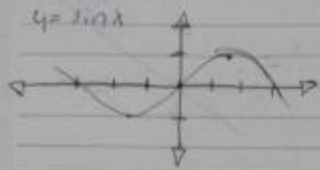
$y=e^x$



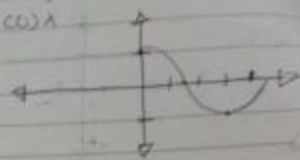
$y=Ln(x)$



$y = \sin x$



$y = \cos x$



★ $y = c$
x-int = (0,0)
y-int = (0,1)
domain = $(-\infty, \infty)$
range = [1]
asymptotes = —
name = linear equation
KP = 4

★ $y = x^2$
x-int = (0,0)
y-int = (0,0)
domain = $(-\infty, \infty)$
range = $(0, \infty)$
asymptotes = —
name = ~~linear equation~~ parabola
KP = (0,0)

★ $y = \sqrt{x}$
x-int = ~~(0,0)~~
y-int = ~~(0,0)~~
domain = $[0, \infty)$
range = $[0, \infty)$
asymptotes = x≤0
name = linear function
KP = (0,0)

★ $y = x$
x-int = 0
y-int = 0
domain = $(-\infty, \infty)$
range = $(-\infty, \infty)$
asymptotes = —
name = ~~linear equation~~ cubic
KP = 1

★ $y = x^3$
x-int = (0,0)
y-int = (0,0)
domain = [-1,1]
range = $(-\infty, \infty)$
asymptotes = —
name = ~~linear equation~~ cubic function
KP = (0,0)

★ $y = \sqrt[3]{x}$
x-int = (0,0)
y-int = (0,0)
domain = $(-\infty, \infty)$
range = $[-\infty, \infty]$
asymptotes = —
name = linear function
KP = (0,0)

★ $y = \frac{1}{x}$
x-int = none
y-int = none
domain = $(-\infty, 0) \cup (0, \infty)$
range = $(-\infty, 0) \cup (0, \infty)$
asymptotes = VA=0 HA=0
name = ~~linear equation~~ rational funct.
key points = y=0 x=0

★ $y = |x|$
x-int = (0,0)
y-int = (0,0)
domain = $(-\infty, \infty)$
range = $[0, \infty)$
asymptotes = none
name = linear function

$y = e^x$

x-int = ~~none~~ (0,1)

y-int = e^0 (0,1)

domain = $(-\infty, \infty)$

range = $\{e^x\}$

asymptotes = none

name = ~~logarithmic~~ exponential function

* $y = \ln(x)$

x-int = (1,0)

y-int = none

domain = $(0, \infty)$

range = $(-\infty, \infty)$

asymptotes = VA=0

name = logarithmic

Keypoints = x=0 (1,0)

* $y = \sin x$

x-int = (0,0)

y-int = (0,0)

domain = $(-\infty, \infty)$

range = $[-1, 1]$

asymptotes = none

name = sine

key points =

* $y = \cos x$

x-int = $(\pi/2, 0)$

y-int = (0,1)

domain = $(-\infty, \infty)$

range = $[-1, 1]$

asymptotes = none

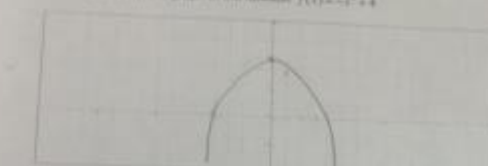
name = cosine function

key points = (0,1) $(\pi/2, 0)$

Slope of Tangent Line Using Secant Line and Concept of Limits
By: Designing Team

Name: Robelo Garcia Group: ______ Date: 09/08/17

1. a) Sketch the graph of the function $f(x) = -x^2 + 4$



ok

Find the slope of the secant line passing through the points P(1,3) and Q (given below)

b) Write the slopes in the following table:

$(x, -x^2+4)$	m
(0,4)	$-\frac{1}{3}$
(0.5, 3.75)	-1.5
(0.9, 3.19)	-1.9
(0.95, 3.0975)	-1.95
(0.99, 3.0199)	-1.99
(0.999, 3.001999)	-1.998

$\frac{y_2-y_1}{x_2-x_1}$

$(x, -x^2+4)$	m
(2,-1)	-4
(1.5, 1.75)	-2.5
(1.1, 2.79)	-2.1
(1.05, 2.8975)	-2.05
(1.01, 2.9799)	-2.01
(1.001, 2.997999)	-2.001

$m = \frac{y_2-y_1}{x_2-x_1}$

c) Which value is being approximated by the secant line when the point Q approaches the point P(1,3)?

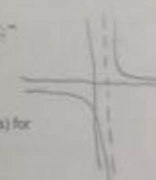
-2

d) Based on the previous information find the slope of the tangent line passing through (1, 3)

-2

e) Find the equation of the tangent line at the point (1, 3)

$y = mx + b$ $3 = (-2)(1) + b$ $5 = b$ $b = 5$ $y = -2x + 5$



2. The point (2,1) lies on the curve $f(x) = \frac{1}{x-1}$

a) If Q is the point $\left(x, \frac{1}{x-1}\right)$, find the slope of the secant line PQ (round to six decimals) for the following values of x:

i) 1.5 ii) 1.75 iii) 1.9 iv) 1.99 v) 1.999

(1.5, 2) (1.75, 1.33...) (1.9, 1.11...) (1.99, 1.0101) (1.999, 1.001001)

$m = -2$ $m = -1.3333$ $m = -1.1111$ $m = -1.0101$ $m = -1.001$

b) Use the results of part (a) to find an estimation of the slope of the tangent line to the curve at (2,1)

3. The point (6,2) lies on the curve $f(x)=\sqrt{x-2}$

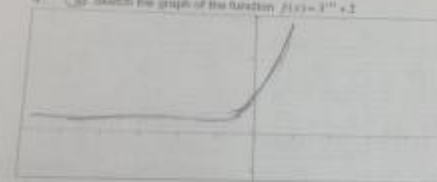
a) If Q is the point $\left(x,\sqrt{x-2}\right)$, find the slope of the secant line PQ (round to six decimals) for the following values of x:

i) 5.5, ... ii) 5.9 ... iii) 5.99 ... iv) 6.001 ... v) 6.01 ... vi) 6.1 ...

b) Use the results of part (a) to find an estimation of the slope of the tangent line to the curve at (6,2)

m= 0.2

4. (a) Sketch the graph of the function $f(x)=3^{x+1}+2$



(b) Find the slope of the secant line passing through the points P(0,5) and Q (given below)

m=0.3

(a) Write the slopes in the following table:

$(x, 3^{x+1}+2)$	m
(0,5)	0
(0.5, 7.196)	4.392
(0.25,5.948)	3.76
(0.15, 5.537)	3.58
(0.1, 5.348)	3.48
(0.01, 5.033)	3.3

$(x, 3^{x+1}+2)$	m
(-0.5,3.732)	2.536
(-0.25, 4.280)	2.88
(-0.15, 4.544)	3.04
(-0.1, 4.688)	3.12
(-0.01, 4.997)	0.3

(b) Which value is being approximated by the secant lines when the point Q approaches the point P(0,5)?

m = 0.3

c) Based on the previous information find the slope of the tangent line passing through (0,5)

d) Find the equation of the tangent line at the point (0, 5)

Finding Limits numerically
By: Ziad Najjar

10/10

Name: Roberto Garcia Flores Group: 403 Date: 15/08/17

Evaluate the following limits numerically:

1) $\lim_{x\to 6}\left(\frac{x^2-36}{x-6}\right) = \frac{(x+6)\cancel{(x-6)}}{\cancel{x-6}} = (6+6) = \boxed{12}$

2) $\lim_{x\to 0}\left(\frac{x^2-2x}{x}\right) = \frac{\cancel{x}(x-2)}{\cancel{x}} = x-2 = \boxed{-2}$

3) $\lim_{x\to -2}\left(\frac{x^3+8}{x+2}\right) = \frac{\cancel{(x+2)}(x^2-2x+4)}{\cancel{(x+2)}}\ (-2)^2-2(-2)+4 = 4+4+4 = \boxed{12}$

4) $\lim_{x\to 2}\left(\frac{x^2+3x-10}{x-2}\right) = \boxed{7}$

5) $\lim_{x\to 3}\left(\frac{\sqrt{x+1}-2}{x-3}\right) = \frac{\sqrt{x+1}+2}{\sqrt{x+1}+2}$ $\boxed{\frac{1}{4}}$

6) $\lim_{x\to 10}\left(\frac{100-x^2}{x-10}\right) = \frac{-(x+10)\cancel{(x-10)}}{\cancel{x-10}} = -(x+10) = -(10+10)$ $\boxed{=-20}$

7) $\lim_{x\to -3}\left(\frac{x^2+14x+33}{2x+6}\right) = \boxed{4}$

8) $\lim_{x\to -1}\left(\frac{2+2x^3}{x+1}\right) = \boxed{6}$

9) $\lim_{x\to 25}\left(\frac{x-25}{\sqrt{x}-5}\right) = \frac{(\sqrt{x}+5)\cancel{(\sqrt{x}-5)}}{\cancel{\sqrt{x}-5}}$

$\sqrt{x}+5 = \sqrt{25}+5 = \boxed{10}$

10) $\lim_{x\to -6}\left(\frac{x^3-36x}{18+3x}\right) = \frac{x(x^2-36)}{3(x+6)} = \frac{x\cancel{(x+6)}(x-6)}{3\cancel{(x+6)}} = \frac{x(x-6)}{3}$

$\frac{-6(-12)}{3} = \frac{72}{3}$ $\boxed{=24}$

Answers:

1) $\lim_{x\to 6}\left(\frac{x^2-36}{x-6}\right) = 12$

2) $\lim_{x\to 0}\left(\frac{x^2-2x}{x}\right) = -2$

3) $\lim\left(\frac{x^3+8}{\ }\right) = 12$

4) $\lim\left(\frac{x^2+3x-10}{\ }\right) = 7$

#7 $\frac{\cancel{(x+3)}(x+11)}{2\cancel{(x+3)}} = \frac{x+11}{2} = \frac{-3+11}{2} = \frac{8}{2} = 4$

#4 $\frac{\cancel{(x-2)}(x+5)}{\cancel{x-2}}$ $= x+5 = 2+5$ $= 7$

#8 $\frac{2(x^3+1)}{x+1} = \frac{2\cancel{(x+1)}(x^2-x+1)}{\cancel{(x+1)}} = 2(x^2-x+1)$

$2((-1)^2-(-1)+1)$

$2(3) = 6$

~~38~~/40
40
OK

Estimating a Limit Numerically
By: Lic. Lucy Solis

Name Roberto Garcia Flores Group 403

Link: http://www.rootmath.org/calculus/estimating-limits-numerically

I. Instructions: Estimate the given limit using a numerical approximation

1. $\lim_{x \to 2} \frac{x-2}{x^2-4} =$

x	1.9	1.99	1.999	2	2.001	2.01	2.1
$f(x)$	0.256	0.251	0.25	[illegible]	0.2499	[illegible]	0.2439

2. Use the table to approximate $\lim_{x \to 5} \frac{2-\sqrt{x-1}}{5-x} =$

x	4.9	4.99	4.999	5.001	5.01	5.1
$f(x)$	0.251	0.250	0.25	0.249	0.249	0.248

x approaches 5 from left

x approaches 5 form the right

3. Use the table to approximate $\lim_{x \to -3} \frac{x+3}{2x^2-18} =$

x	−3.1	−3.01	−3.001	-3	−2.999	−2.99	−2.9
$f(x)$	-0.081	-0.0831	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

4. Use the table to approximate $\lim_{h \to 0} \frac{(5+h)^2-25}{h} =$

x	−0.1	−0.01	−0.001	0	0.001	0.01	0.1
$f(x)$	9.9	[illegible]	[illegible]	[illegible]	10.001	10.01	10.1

5. $\lim_{x \to 0} \frac{\sin(x)}{x} =$

x	−0.1	−0.01	−0.001	0	0.001	0.01	0.1
$f(x)$	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

6. $\lim_{x \to 0} \frac{\sqrt{x+1}-1}{x}$

x	−0.1	−0.01	−0.001	0	0.001	0.01	0.1
$f(x)$	0.513	0.501	0.50	[illegible]	[illegible]	0.498	[illegible]

7. Find $\lim_{x \to 0} f(x)$ if $f(x) = \begin{cases} x-1 & x < 0 \\ x^3 & x \geq 0 \end{cases}$

x	-0.1	-0.01	-0.001	0	0.001	0.01	0.1
$f(x)$	-1.1	-1.01	-1.001	∄	0.000001	0.0001	0.01

8. Find $\lim_{x \to 2} f(x)$ if $f(x) = \begin{cases} x^2+1 & x < 2 \\ 2x-3 & x \geq 2 \end{cases}$

x	1.9	1.99	1.999	2	2.001	2.01	2.1
$f(x)$	4.61	4.9601	4.9960	∄	1.002	1.02	1.2

∄

0.4 0.96 0.996

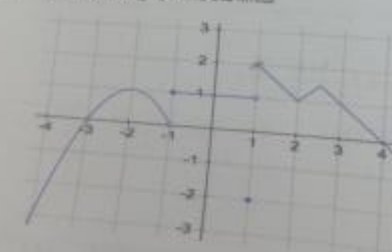
9. Find $\lim_{x \to 2} \frac{x+1}{x-2}$

x	1.9	1.99	1.999	2	2.001	2.01	2.1
$f(x)$	-29	-299	-2999	∄	3001	301	31

10. Find $\lim_{x \to 1} \frac{x^2}{(x-1)^2}$ $\quad \frac{x^2}{(x-1)(x+1)}$

x	0.9	0.99	0.999	1	1.001	1.01	1.1
$f(x)$	81	9801	998001	∄	1002001	10201	121

II. Based on the graph find the limits



a) $\lim f(x) = 1$

b) $\lim f(x) = 0$

c) $\lim f(x) = ∄$

d) $\lim f(x) = 2$

e) $\lim f(x) = 1$

f) $\lim f(x) = ∄$

g) $\lim f(x) = 1$

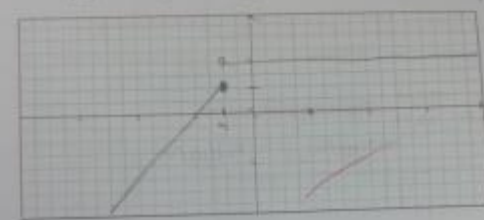
h) $\lim f(x) = 1$

i) $\lim f(x) = 1$

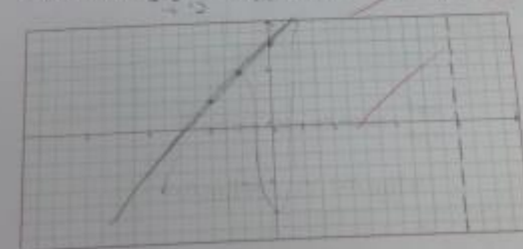
III. Graph the following functions and find their limits

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

Find i) $\lim\limits_{x \to -1^-} f(x) = 2$ ii) $\lim\limits_{x \to -1^+} f(x) = 1$ iii) $\lim\limits_{x \to -1} f(x) = \nexists$



2. Graph $f(x) = \dfrac{x^2-9}{x-3}$ find i) $\lim\limits_{x \to 3^-} \dfrac{x^2-9}{x-3} = 6$ ii) $\lim\limits_{x \to 3^+} \dfrac{x^2-9}{x-3} = 6$ iii) $\lim\limits_{x \to 3} \dfrac{x^2-9}{x-3} = 6$



Quiz # 1A

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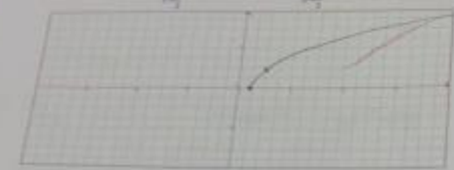
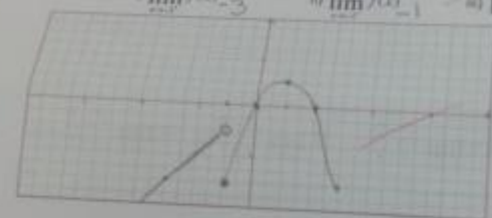
3. Graph $f(x)=\sqrt{2x-1}$ find
 a) Domain $[\frac{1}{2}, \infty)$
 b) i) $\lim \sqrt{2x-1} = 0$ ii) $\lim \sqrt{2x-1} = 0$



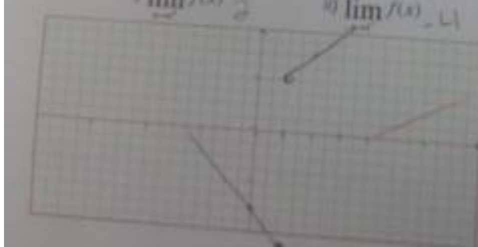
4. If $f(x)=\begin{cases} x & x<-1 \\ -x^2+2x & x\geq -1 \end{cases}$ Sketch the graph and find

i) $\lim f(x)$ -3 ii) $\lim f(x)$ -1 iii) $\lim f(x)$ ∄



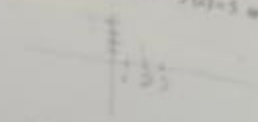
5. If $f(x)=\begin{cases} -x-3 & x\leq 1 \\ x+1 & x>1 \end{cases}$ sketch the graph and find

i) $\lim f(x)$ 2 ii) $\lim f(x)$ -4 iii) $\lim f(x)$ ∄



6. Give an example of a two-sided limit of a piecewise function where the limit does not exit.

7. Sketch a graph so that $f(2)=5$ and $\lim f(x)=1$ $\lim f(x)=3$



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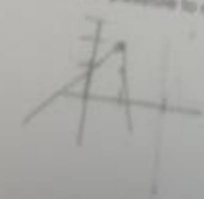
8. Explain the meaning of $\lim f(x)=2$

Is it possible to obtain $\lim f(x)=2$ and $f(2)=4$? Justify the answer.



It's not possible because the 2 function are going to be very close.

9. Explain the meaning of $\lim f(x)=2$ and $\lim f(x)=5$

Is it possible that $\lim f(x)$ exists? Justify the answer.

It's not possible that $\lim f(x)$ is not because you have a different values in the same x-axis value.

Calculus I — Quiz

Name: ______________________

Find the following limits (8 pts each)

a) $\lim 8 = 8$

b) $\lim \ln x = 1$

c) $\lim_{x \to \pi/2} \frac{\operatorname{sen} x}{2} = 0.35$

d) $\lim \frac{x^2 - x + 12}{x + 3} = -7$

$\frac{(x+3)(x-4)}{x-3}$ $x \cdot 4$

e) $\lim \frac{x-2}{x^2+4x-3} = \frac{-2}{-6} = \boxed{\frac{1}{3}}$

f) $\lim \frac{(h-3)^2-9}{h}$ $h - 6 = -6$

g) $\lim \frac{4-x}{2-\sqrt{x}}$ $\frac{(2+\sqrt{x})\cancel{(2-\sqrt{x})}}{\cancel{2-\sqrt{x}}} = 2+\sqrt{x} = 2+2 = 4$

Based on the given graphs of functions determine the limits (4 pts each)

Function 1

a) $\lim f(x) = \nexists$

b) $\lim f(x) = 6$

Function 2

a) $\lim f(x) = 4$

b) $\lim f(x) = \nexists$

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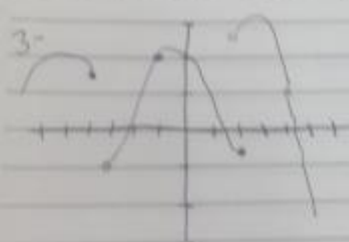
Correcciones Quiz #1

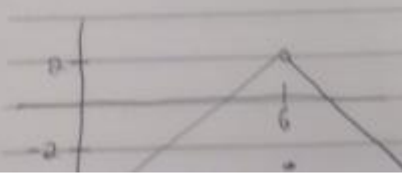
3-



[illegible] $f(4) = \nexists$

Correcciones Quiz #2

Funcion 2



$\lim_{x \to 6} f(x) = 2$

PrepaTec

CALCULUS I

Quiz # 10

Name Roberto Garcia Flores   ID A01590??

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very good!! :)

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

$$\lim_{x \to 0} \frac{\sqrt{x+1}-1}{x}$$

x	-0.1	-0.01	-0.001	0	0.001	0.01	0.1
$f(x)$	0.5131	0.5012	0.5001	∄	[illegible]	[illegible]	[illegible]

≈ 0.5

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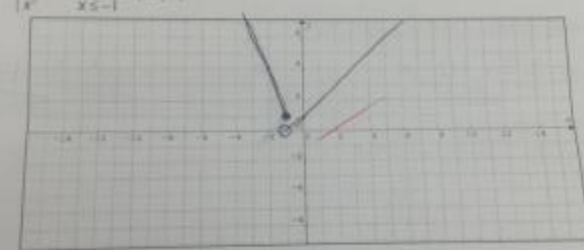
2. Graph the following functions and find their limits.

$$f(x) = \begin{cases} x+1 & x > -1 \\ x^2 & x \le -1 \end{cases}$$ (15 pts)



15

Find (20 pts)

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

b) $\lim_{x \to -1^-} f(x)$ 1

c) $\lim_{x \to -1} f(x)$ ∄

d) $f(-1)$ 1

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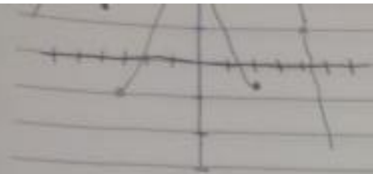
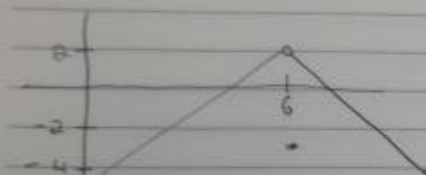


Correcciones Quiz #2

Funcion 2



$$\lim_{x \to 6} f(x) = 2$$

1- $\lim_{x \to -1^+} \frac{x-2}{x+1}$ c: $\lim f(x) = -\infty$

2- $\lim_{x \to -3^-} \frac{4x}{9-x^2}$