Asignatura: Cálculo Diferencial CAD941

Docente: Gerver Alonso Castro Morales

Integrantes

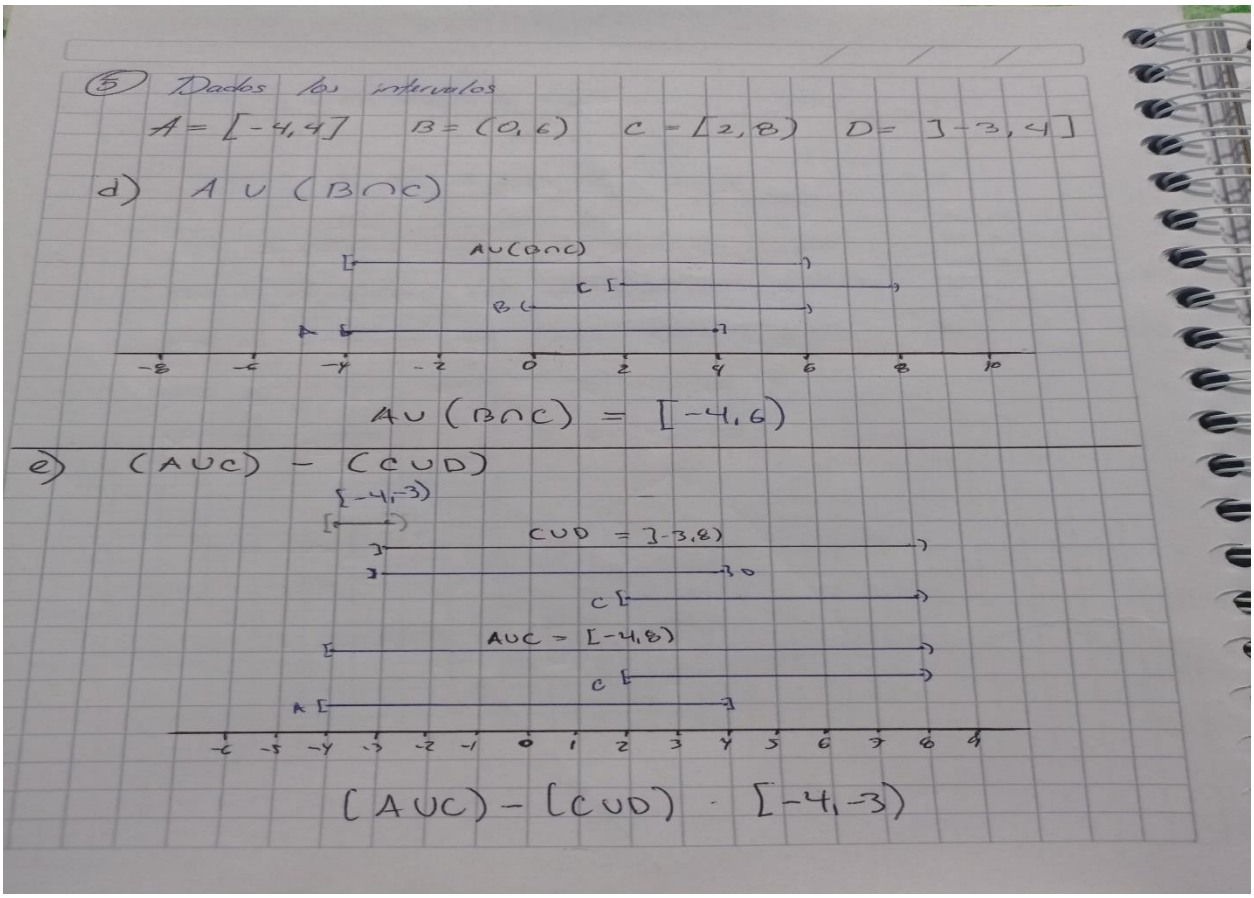
1) Abdías de Jesús Martínez Hernández - MH240120

2) Carlos Mauricio Medrano Ortega - MO241705

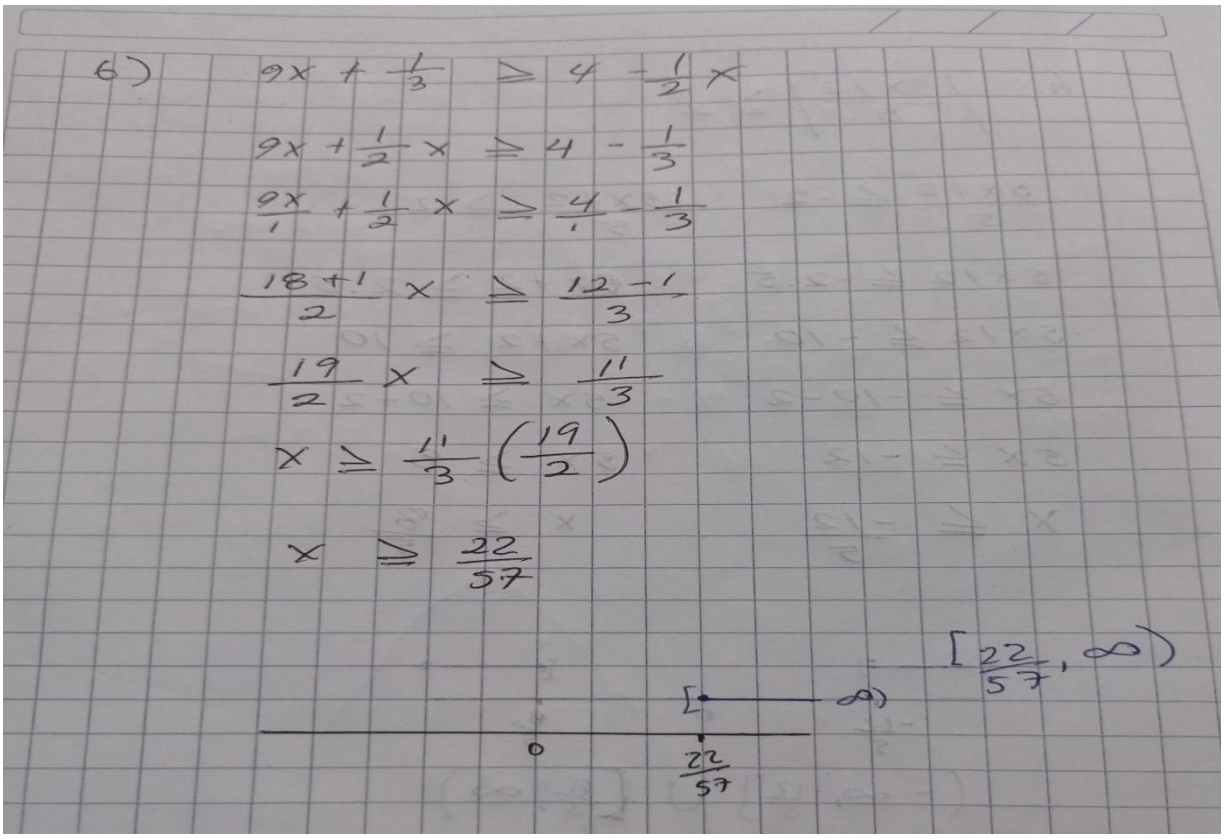
3)Cesar Caleb Martinez Machado – MM213127

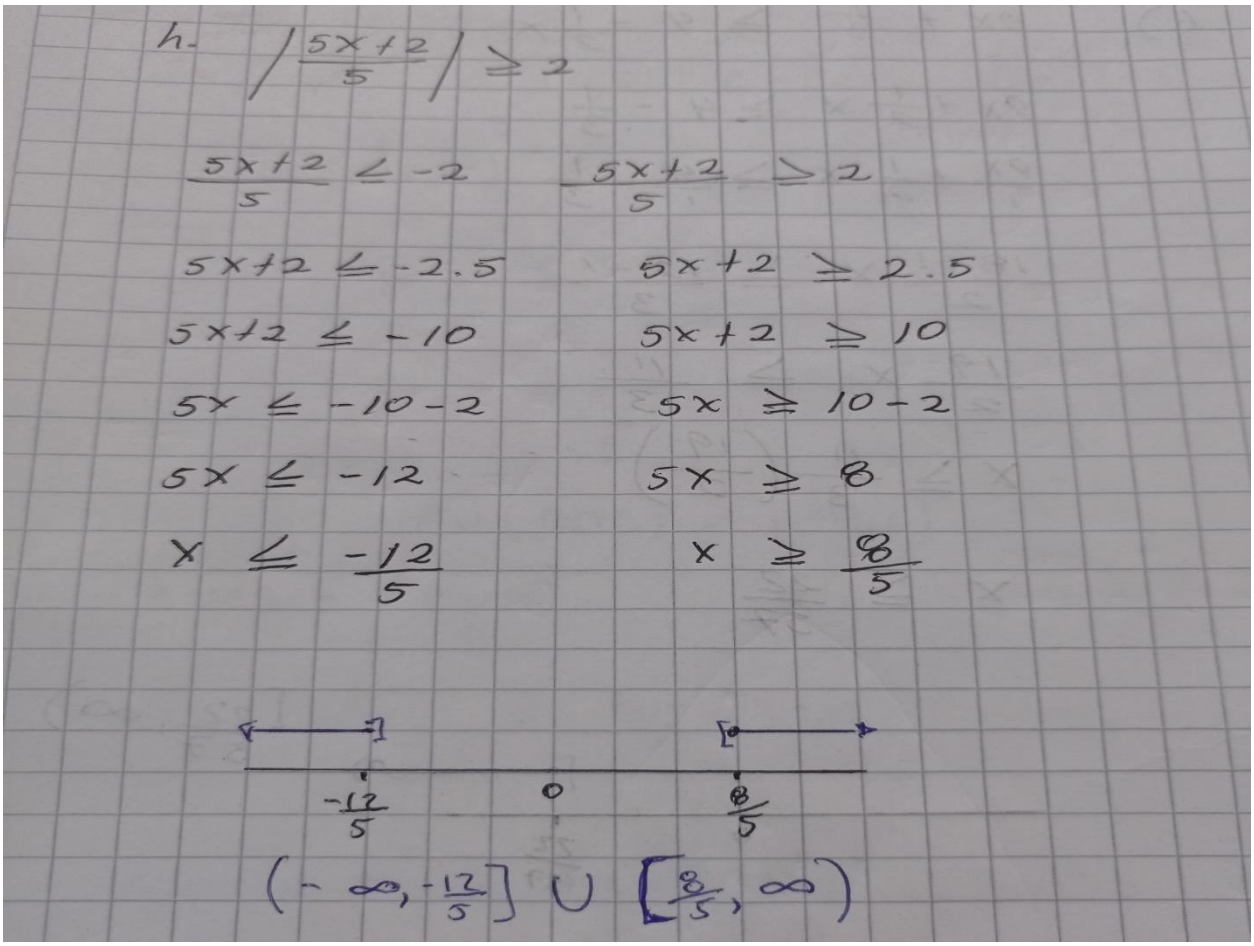
Actividad: Guia #1

Apartado 5


5 Dados los intervalos
A = [-4, 4] B = (0, 6) C = [2, 8) D =]-3, 4]
d) A ∪ (B ∩ C)
A∪(B∩C)
C
B
A
-8 -6 -4 -2 0 2 4 6 8 10
A∪(B∩C) = [-4, 6)
e) (A∪C) − (C∪D)
[-4, -3)
C∪D =]-3, 8)
C
A∪C = [-4, 8)
C
A
-6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8 9
(A∪C) − (C∪D) = [-4, -3)

Apartado 6


6)
$9x + \frac{1}{3} \geq 4 - \frac{1}{2}x$
$9x + \frac{1}{2}x \geq 4 - \frac{1}{3}$
$\frac{9x}{1} + \frac{1}{2}x \geq \frac{4}{1} - \frac{1}{3}$
$\frac{18+1}{2}x \geq \frac{12-1}{3}$
$\frac{19}{2}x \geq \frac{11}{3}$
$x \geq \frac{11}{3}\left(\frac{19}{2}\right)$
$x \geq \frac{22}{57}$
$\left[\frac{22}{57}, \infty\right)$
$\frac{22}{57}$


h. $\left|\frac{5x+2}{5}\right| \geq 2$
$\frac{5x+2}{5} \leq -2$
$5x+2 \leq -2.5$
$5x+2 \leq -10$
$5x \leq -10-2$
$5x \leq -12$
$x \leq \frac{-12}{5}$
$\frac{5x+2}{5} \geq 2$
$5x+2 \geq 2.5$
$5x+2 \geq 10$
$5x \geq 10-2$
$5x \geq 8$
$x \geq \frac{8}{5}$
$\frac{-12}{5}$
$\frac{8}{5}$
$\left(-\infty, -\frac{12}{5}\right] \cup \left[\frac{8}{5}, \infty\right)$

Apartado 11

11. Trace la gráfica de cada función, indicando su dominio y rango.

$y = -(x-2)^2 + 3$

Vertice $(2, 3)$

$x - 2 = 0$

$x = 2$

x	y
0	-1
1	2
2	3
3	2
4	-1

$y = -(0-2)^2 + 3$

$y(0) = -(2)^2 + 3$

$y(0) = -4 + 3$

$y(0) = -1$

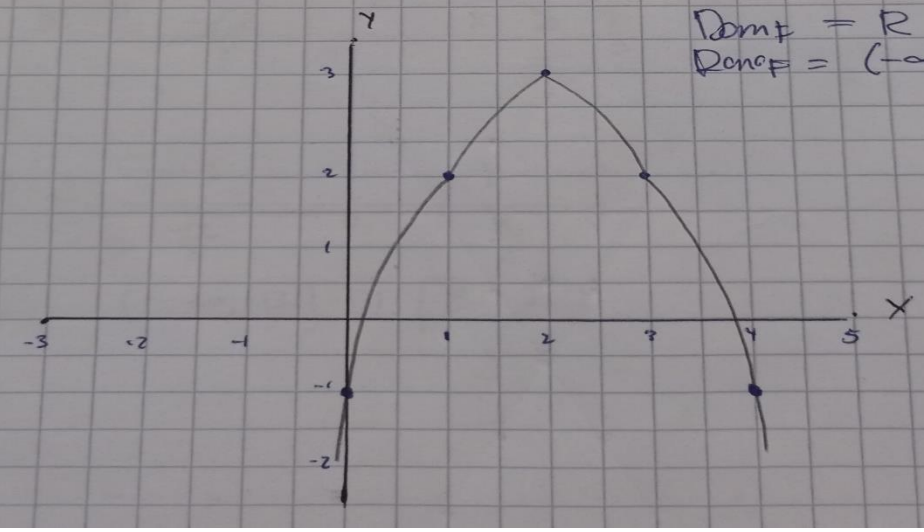
$y = -(2-2)^2 + 3$

$y = -(2-2)^2 + 3$

$y = 3$

$Dom_f = R$

$Rango_f = (-\infty, 3]$



h) $y = \sqrt{x^2 - 9x + 20}$

$D_f = x^2 - 9x + 20$

$(x-5)(x-4) \geq 0$

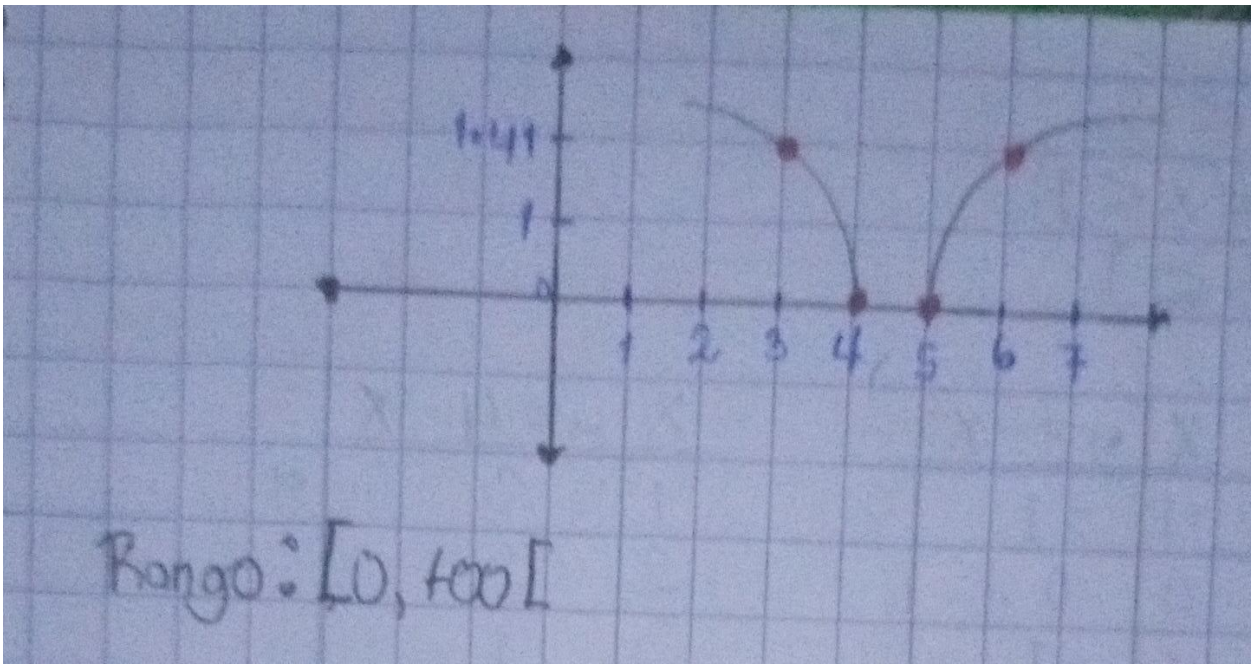
$x - 5 = 0 \quad x - 4 = 0$

$x = 5 \quad x = 4$

	$-\infty$	3	4	4,5	5	6	∞
$x-5$		−		−		+	
$x-4$		−		+		+	
$(x-5)(x-4)$		+		−		+	

x	y
3	1.414
4	0
5	0
6	1.414

Dominio: $]-\infty, 4] \cup [5, \infty[$



Rango: $[0, +\infty[$

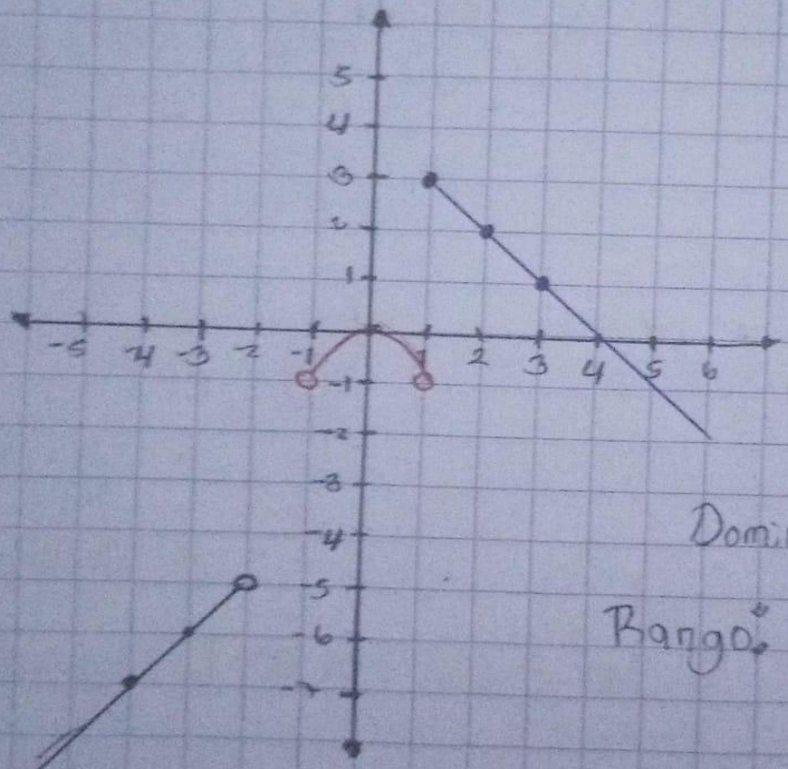
Apartado 12

12 b) $f(x)\begin{cases} x-3, & x \leq -2 \\ -x^2, & -1 < x < 1 \\ 4-x, & x \geq 1 \end{cases}$

x	$y = x-3$
-2	-5
-3	-6
-4	-7

x	$y = -x^2$
-1	-1
0	0
1	-1

x	$y = 4-x$
1	3
2	2
3	1



Dominio: $x \in \mathbb{R}$

Rango: $]-\infty, 3]$

Apartado 13

13.) $f(x) = \frac{1}{x+1}$ $g(x) = \frac{x}{x+1}$

$F+g = \frac{1}{x+1} + \frac{x}{x+1} = \frac{1+x}{x+1} =$ $D_f = \mathbb{R} - \{-1\}$ $R_F = \mathbb{R}$

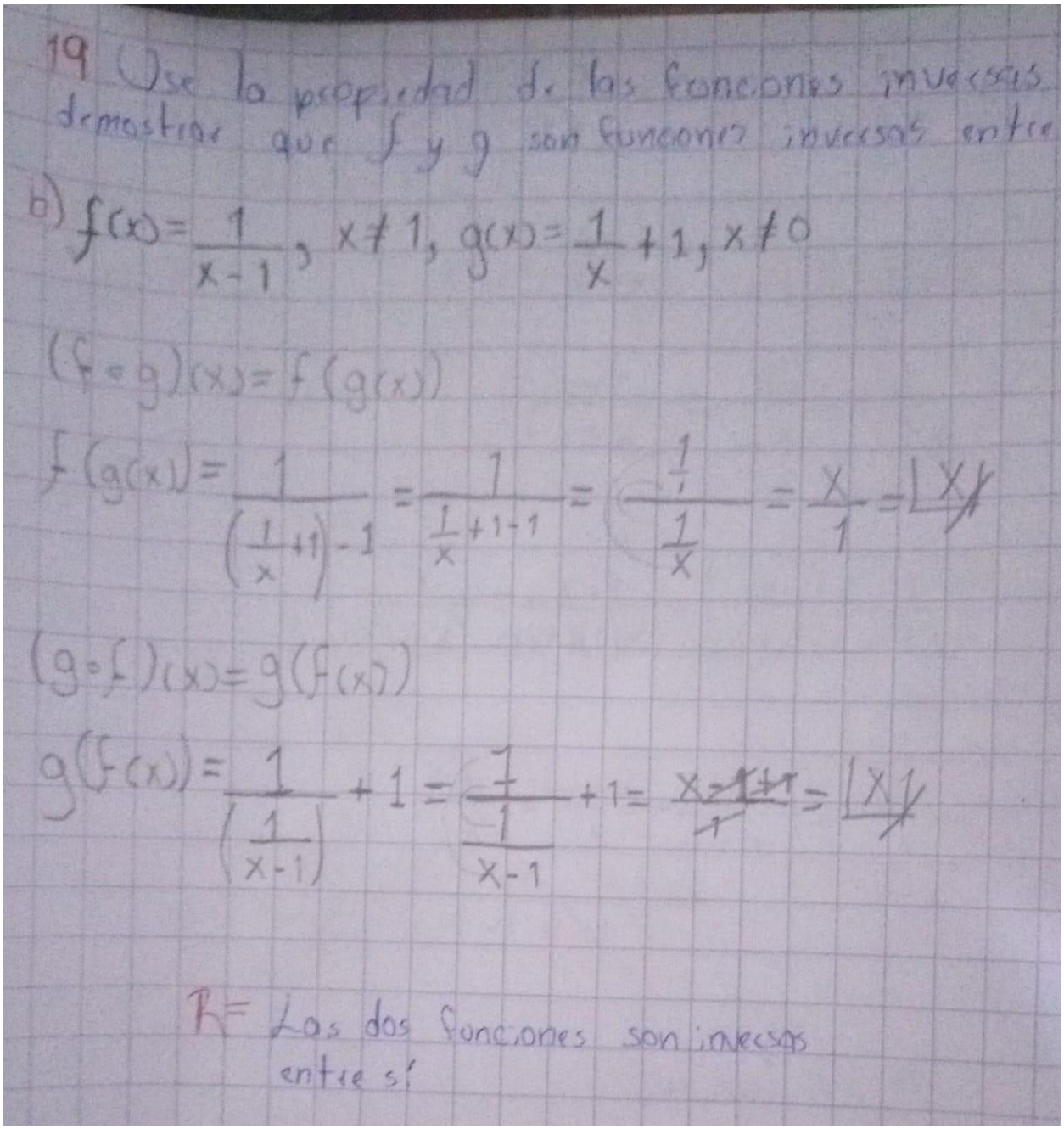
$F-g = \frac{1}{x+1} - \frac{x}{x+1} = \frac{1-x}{x+1} =$ $D_f = \mathbb{R} - \{-1\}$ $= R_f = \mathbb{R}$

$F \cdot g = \frac{1}{x+1} \cdot \frac{x}{x+1} = \frac{x}{(x+1)^2} =$ $D_F = \mathbb{R}$ $= R_f = \mathbb{R}$

$F/g = \frac{1}{x+1} \div \frac{x}{x+1} =$

$\frac{1}{x+1} \cdot \frac{x+1}{x} = \frac{1}{x} =$ $D_f = \mathbb{R} - \{0\}$ $R_f = \mathbb{R} - \{0\}$

Apartado 19.



19 Use la propiedad de las funciones inversas demostrar que f y g son funciones inversas entre

b) $f(x)=\frac{1}{x-1}, x\neq 1, g(x)=\frac{1}{x}+1, x\neq 0$

$(f\circ g)(x)=f(g(x))$

$f(g(x))=\frac{1}{\left(\frac{1}{x}+1\right)-1}=\frac{1}{\frac{1}{x}+1-1}=\frac{1}{\frac{1}{x}}=\frac{x}{1}=x$

$(g\circ f)(x)=g(f(x))$

$g(f(x))=\frac{1}{\left(\frac{1}{x-1}\right)}+1=\frac{1}{\frac{1}{x-1}}+1=\frac{x-1+1}{1}=x$

R= Las dos funciones son inversas entre sí

II F) $y = -2|x-3|-4$

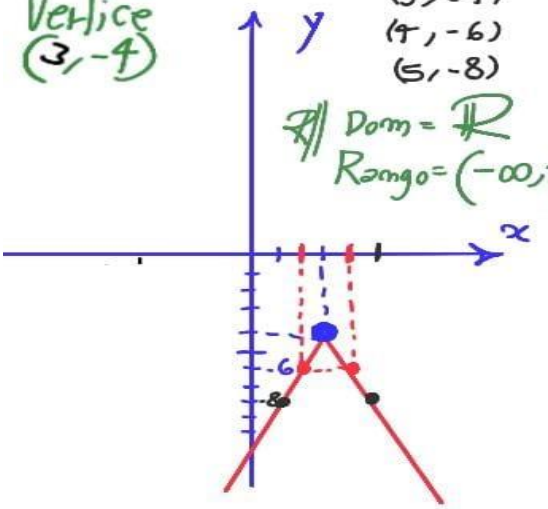
$a|x-h|+K$

(h, K) son las coordenadas de la Función h(horizontal) y K(vertical)

Vertice $(3, -4)$

x	1	2	3	4	5
y	-8	-6	-4	-6	-8

$(1, -8)$
$(2, -6)$
$(3, -4)$
$(4, -6)$
$(5, -8)$



Dom = $\mathbb{R}$

Rango = $(-\infty, 3]$

$= -2|1-3|-4$
$= -2|-2|-4$
$= -2(2)-4$
$= -4-4$
$= -8$

$= -2|2-3|-4$
$= -2|-1|-4$
$= -2(1)-4$
$= -2-4$
$= -6$

$= -2|x-3|-4$
$= -2|3-3|-4$
$= -2|0|-4$
$= -4$

$= -2|4-3|-4$
$= -2|1|-4$
$= -2-4$
$= -6$

$= -2|5-3|-4$
$= -2|2|-4$
$= -4-4$
$= -8$