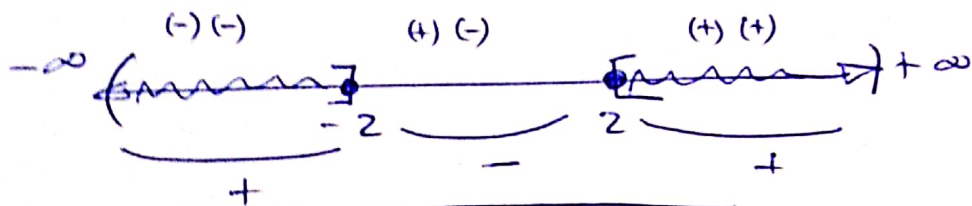


# RESPOSTAS AOS EXERCÍCIOS DE FUNÇÕES

① a)  $x^2 - 4 \geq 0 \rightarrow (x+2)(x-2) \geq 0$



$$D(f) = (-\infty, -2] \cup [2, +\infty)$$

b) Para  $\frac{1}{x-1}$ ;  $x \neq 1$

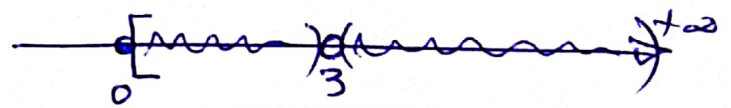
Para  $\sqrt{x}$ ;  $x \geq 0$



$$D(f) = [0, 1) \cup (1, +\infty)$$

c) Para  $\sqrt{x}$ ;  $x > 0$

Para  $\frac{1}{x-3}$ ;  $x \neq 3$



$$D(f) = [0, 3) \cup (3, +\infty)$$

d)  $\frac{x}{x-5} \geq 0$ ;  $x \neq 5$

Number line diagram for  $\frac{x}{x-5} \geq 0$ . Critical points are at  $x = 0$  and  $x = 5$ . The sign chart shows:   
 - For  $x < 0$ :  $\frac{(-)}{(-)}$  is positive (+).   
 - For  $0 < x < 5$ :  $\frac{(+)}{(-)}$  is negative (-).   
 - For  $x > 5$ :  $\frac{(+)}{(+)}$  is positive (+).   
 The solution set is  $x \in (-\infty, 0] \cup (5, +\infty)$ .

$$D(f) = (-\infty, 0] \cup (5, +\infty)$$

e)  $x^2 - 4 \neq 0 \rightarrow x \neq \pm 2$  ;  $D(f) = \mathbb{R} - \{\pm 2\}$

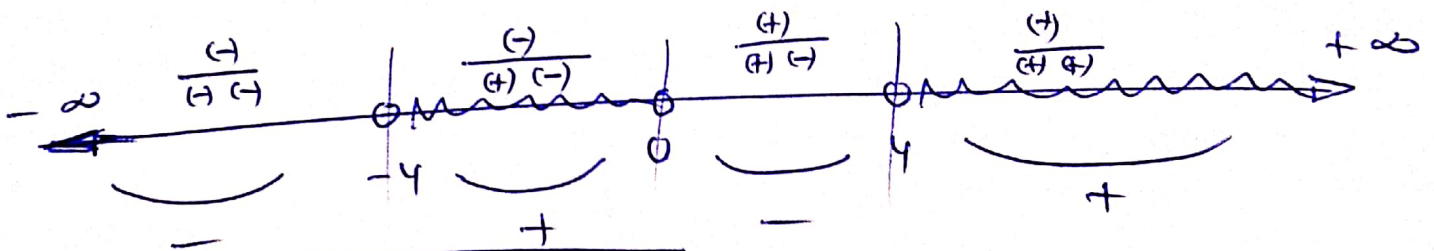
f)  $x^2 - 16 \neq 0 \rightarrow x \neq \pm 4$  ;  $D(f) = \mathbb{R} - \{\pm 4\}$

g)  $\log_3(x-1)$  ;  $x-1 > 0 \rightarrow x > 1$   
 $\log_3(1-x)$  ;  $1-x > 0 \rightarrow 1 > x$  }  $x$  non pode ser maior que 1 e menor que 1 simultaneamente

$D(f) = \emptyset$  Conjunto vazio

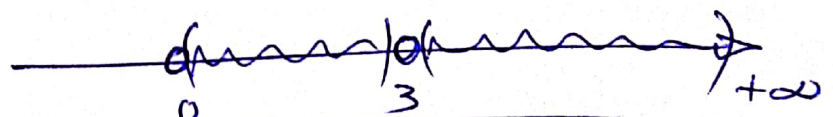
h) idêntico a b) Repetido

i)  $\frac{x}{x^2-16} > 0$  ;  $\frac{x}{(x+4)(x-4)} > 0$  ;  $x \neq \{0, 4, -4\}$



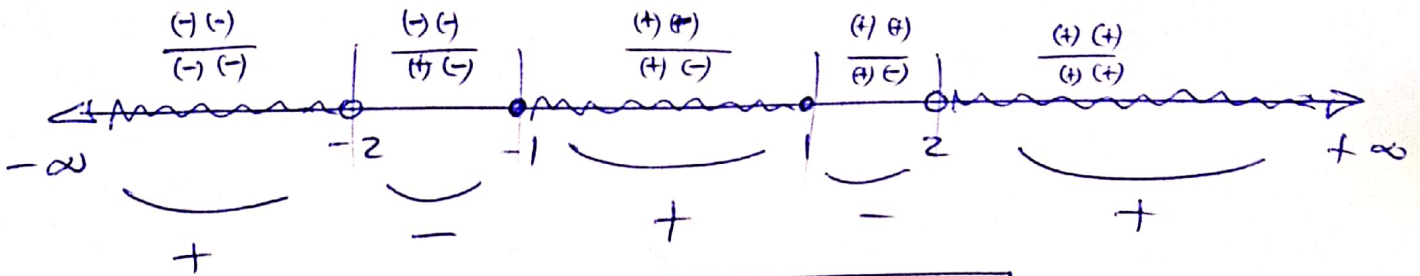
$D(f) = (-4, 0) \cup (4, +\infty)$

j)  $\log x$  ;  $x > 0$   
 $x-3$  ;  $x \neq 3$

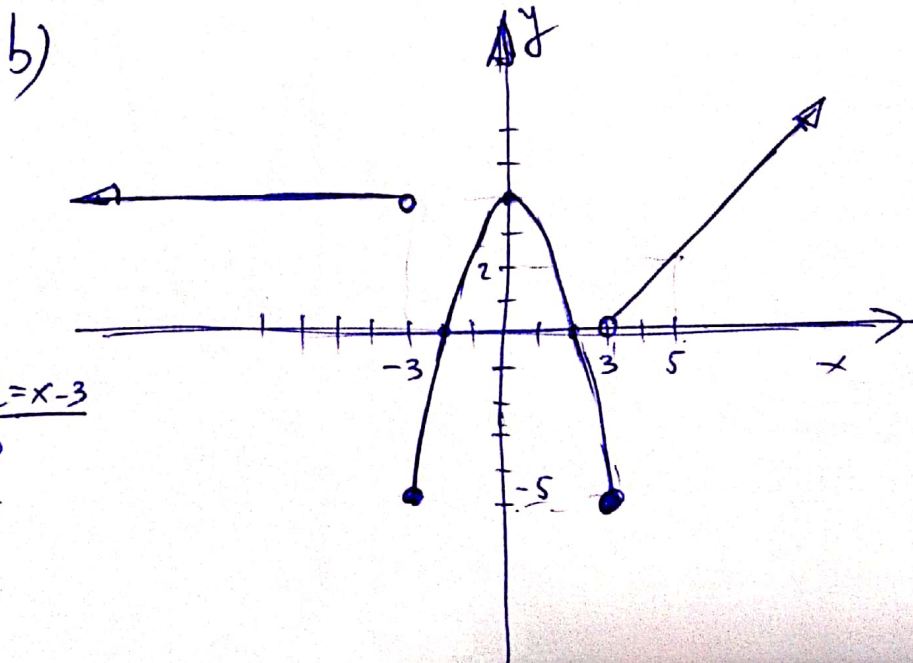
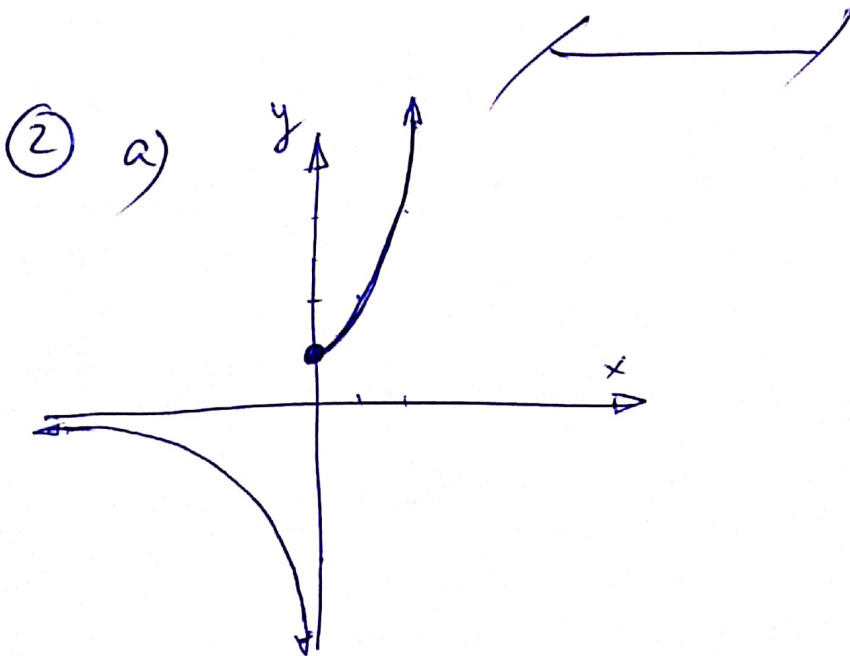


$D(f) = (0, 3) \cup (3, +\infty)$

k)  $\frac{x^2-1}{x^2-4} \geq 0$ ;  $\frac{(x+1)(x-1)}{(x+2)(x-2)} \geq 0$ ;  $x \neq \pm 2$  Por estar no denominador.



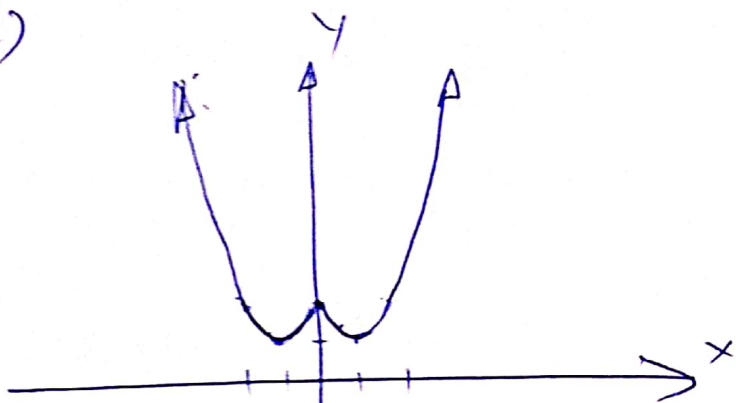
$$D(f) = (-\infty, -2) \cup [-1, 1] \cup (2, +\infty)$$



x	y = -x <sup>2</sup> + 4	
0	4	Vértice
-2	0	Cortes con X
2	0	
-3	-5	
3	-5	

x	y = x - 3
3	0
5	2

c)



$$y = x^2 + 2x + 2$$

$$D = b^2 - 4ac = -4$$

$$x_v = -\frac{b}{2a} = \frac{-2}{2 \cdot 1} = -1$$

$$y_v = -\frac{D}{4a} = \frac{-(-4)}{4 \cdot 1} = 1$$

$$V(-1, 1)$$

$D < 0 \Rightarrow$  Non write a X  
 $a = 1 \Rightarrow \cup$

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

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

$$y = x^2 - 2x + 2$$

$$D = b^2 - 4ac = -4$$

$$x_v = -\frac{b}{2a} = \frac{-(-2)}{2 \cdot 1} = 1$$

$$y_v = -\frac{D}{4a} = \frac{-(-4)}{4 \cdot 1} = 1$$

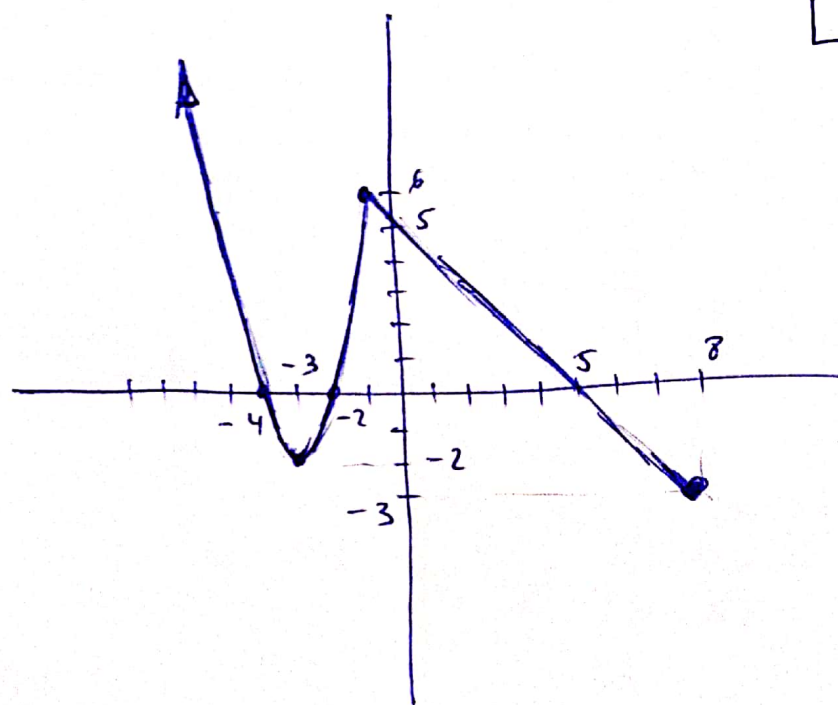
$$V(1, 1); D < 0 \Rightarrow$$
 Non write a X  
 $a = 1 > 0 \cup$

d)  $y = 2x^2 + 12x + 16$ ;  $D = b^2 - 4ac = 16$ ;  $\left\{ \begin{array}{l} x_v = -\frac{b}{2a} = -3 \\ y_v = -\frac{D}{4a} = -2 \end{array} \right\} V = (-3, -2)$

$D = 16 > 0 \Rightarrow$  write a X en

$$\rightarrow x_1 = \frac{-b + \sqrt{D}}{2a} = -2$$

$$\rightarrow x_2 = \frac{-b - \sqrt{D}}{2a} = -4$$



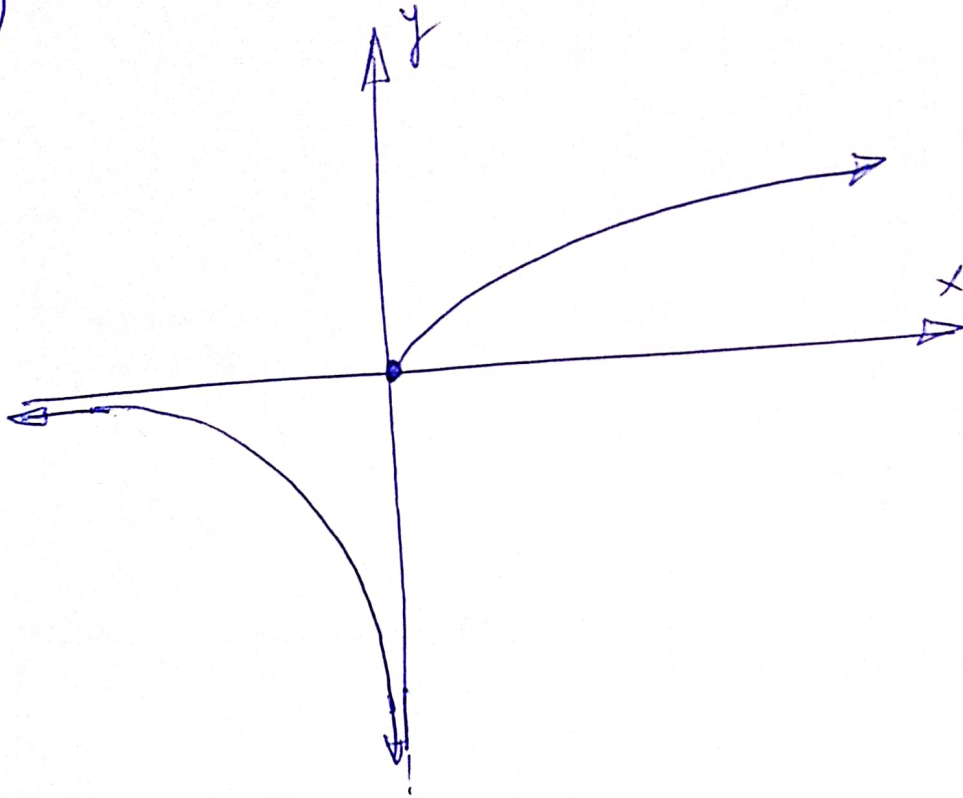
Recta  $y = -x + 5$

x	y = -x + 5
-1	6
0	5
5	0
8	-3

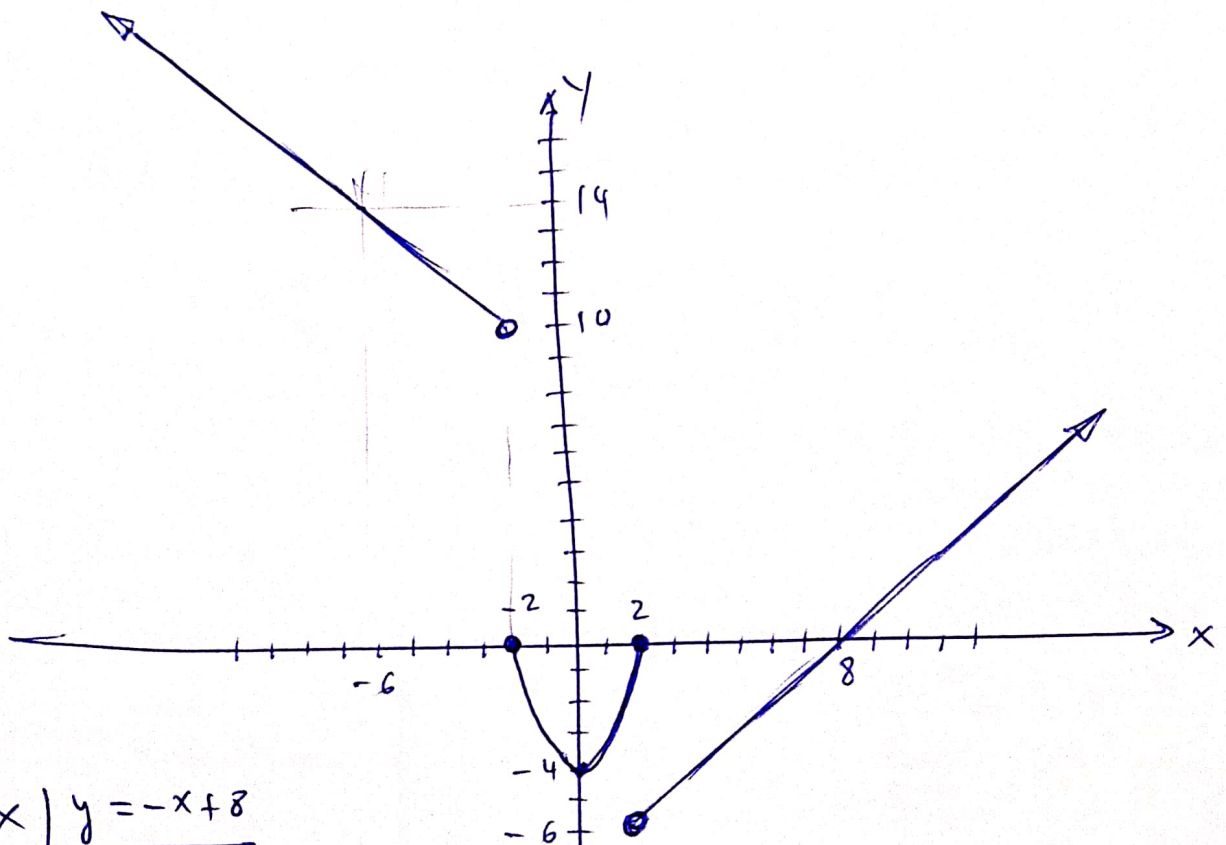
x	y = 2x^2 + 12x + 16
-1	6
-2	0
-3	-2
-4	0
-5	6

Parabola

e)



f)



x	y = -x + 8
-2	10
-6	14

x	y = x <sup>2</sup> - 4	
0	-4	Vertice
-2	0	Corte con X
2	0	Corte con X

x	y = x - 8	
2	-6	
8	0	Corte con X

g)

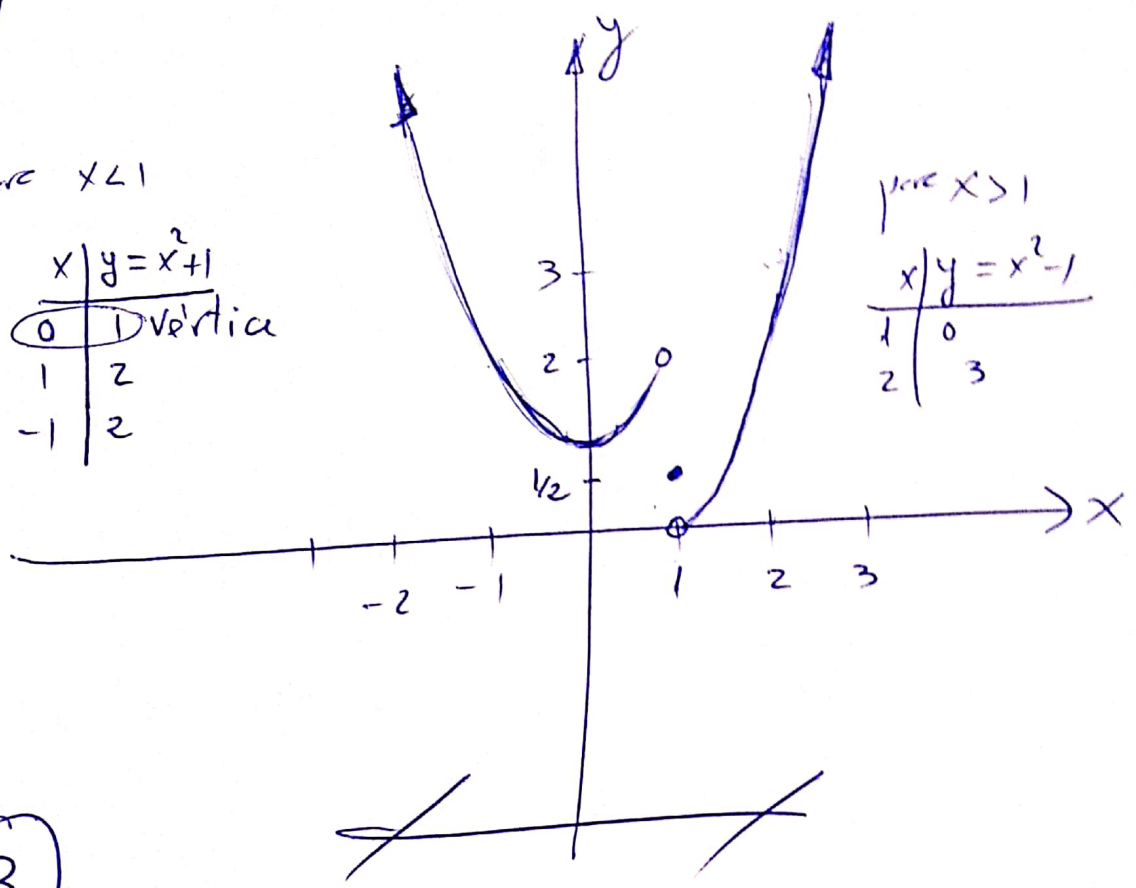
para  $x < 1$

x	y = x <sup>2</sup> + 1
0	1
1	2
-1	2

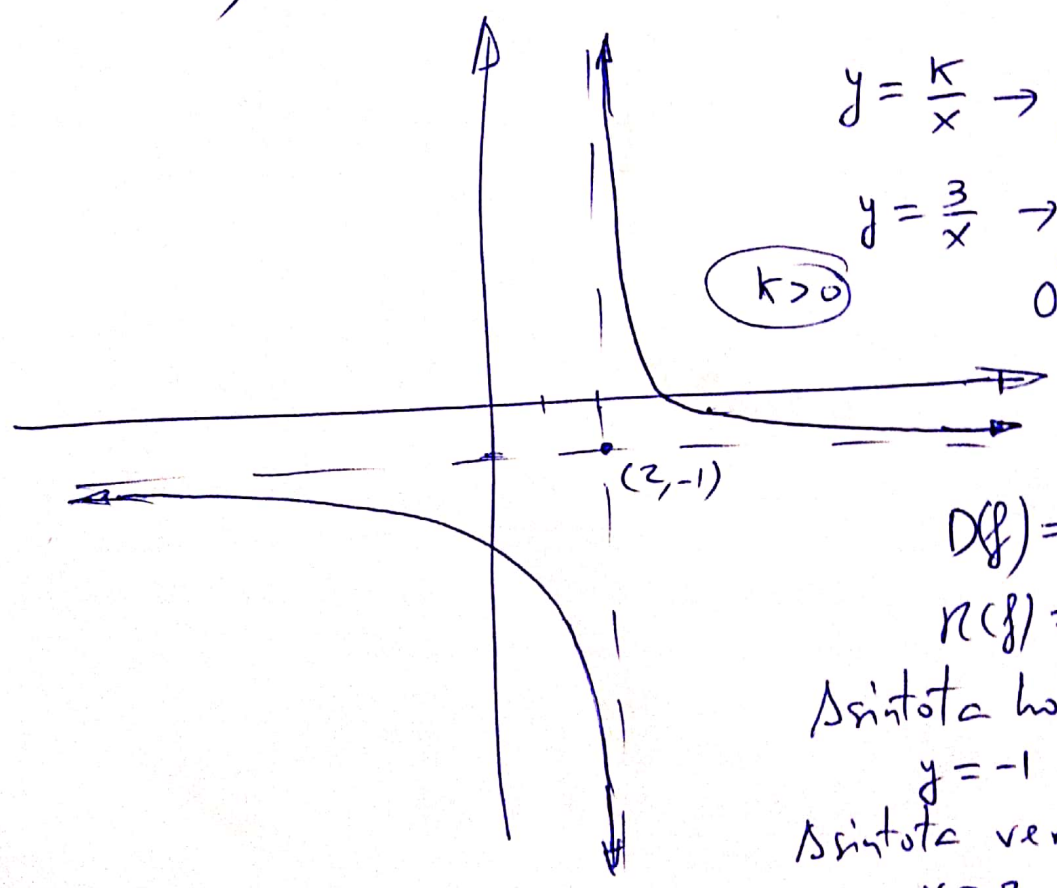
vertical

para  $x > 1$

x	y = x <sup>2</sup> - 1
1	0
2	3



3 a)



$$y = \frac{k}{x} \rightarrow y = v + \frac{k}{x+h}$$

$$y = \frac{3}{x} \rightarrow y = -1 + \frac{3}{x-2}$$

$k > 0$

$$O' = (-h, v) = (2, -1)$$

$$D(f) = \mathbb{R} - \{2\}$$

$$R(f) = \mathbb{R} - \{-1\}$$

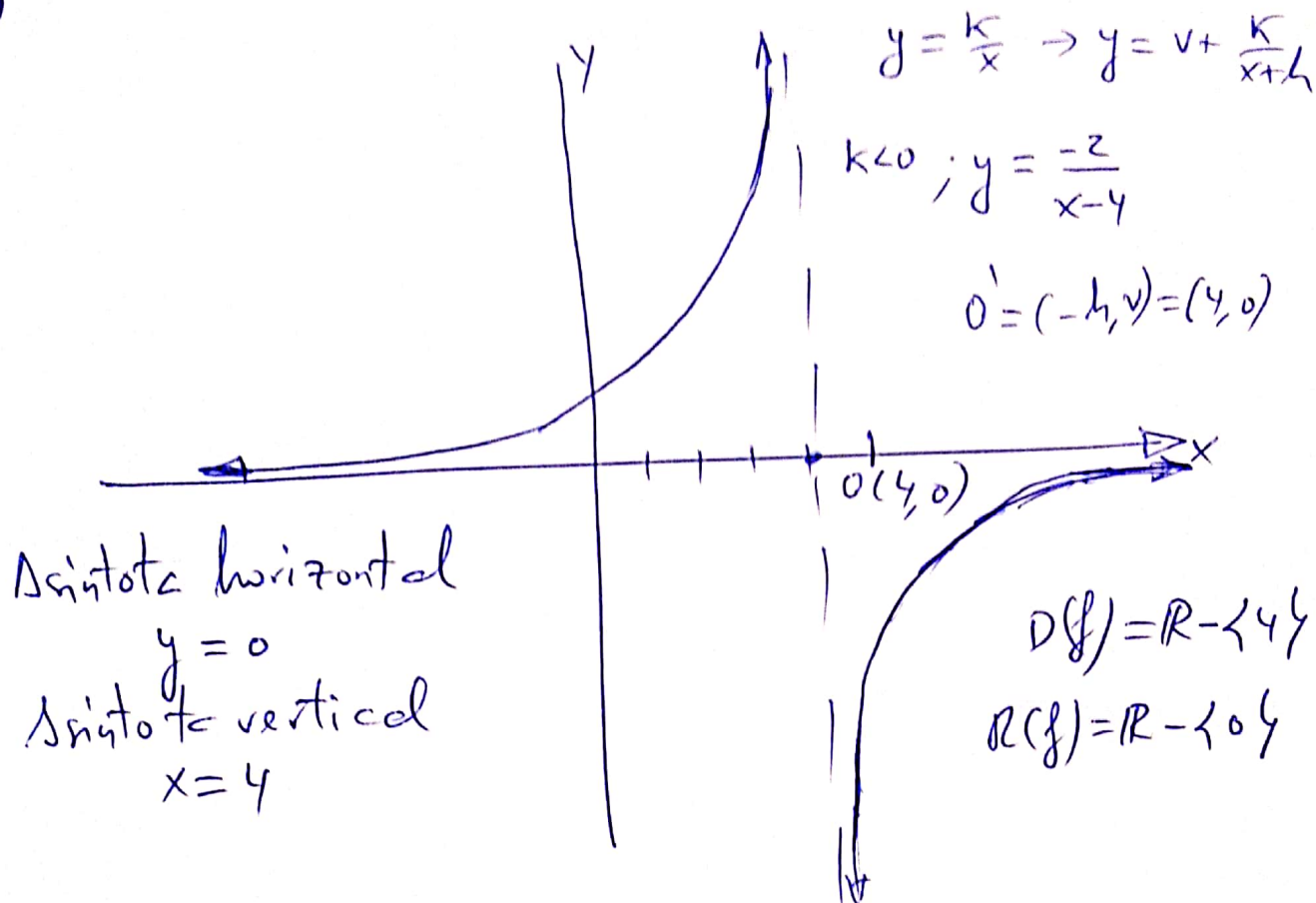
Asintota horizontal

$$y = -1$$

Asintota vertical

$$x = 2$$

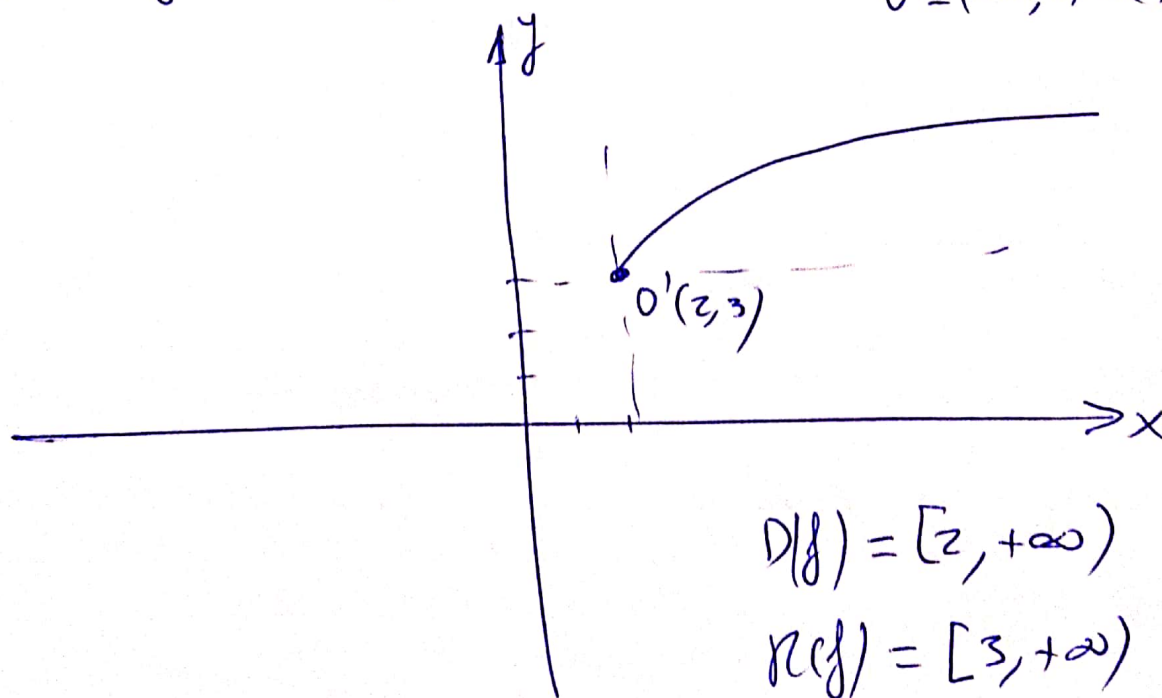
b)



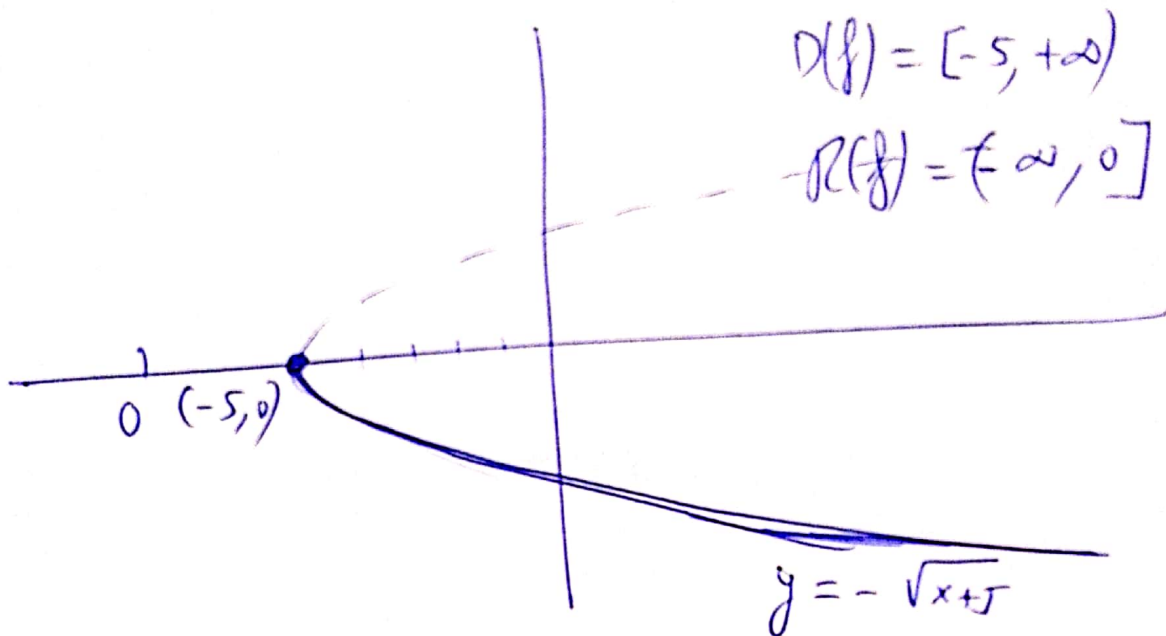
c)

$$y = \sqrt{x} \rightarrow y = v + \sqrt{x+h} ; y = 3 + \sqrt{x-2}$$

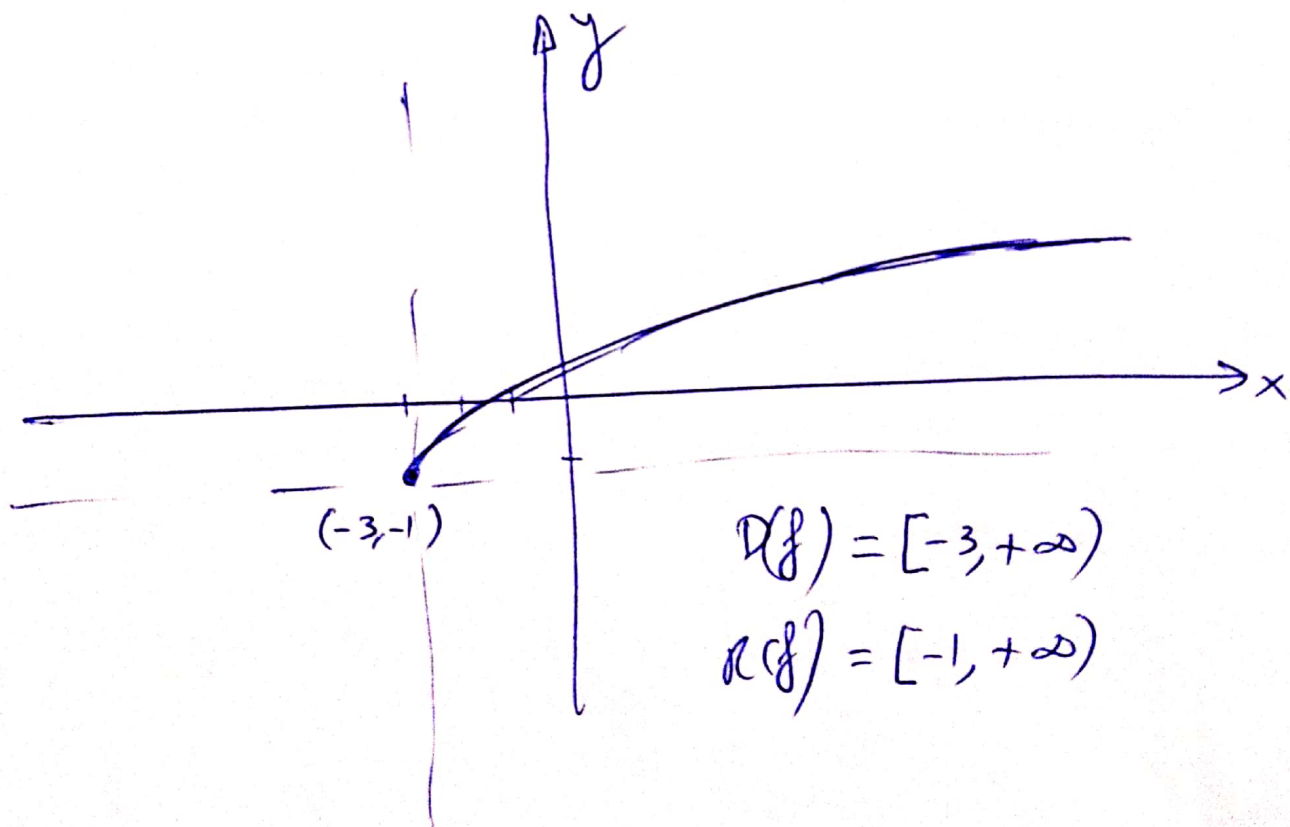
$$O' = (-h, v) = (2, 3)$$



d)  $y = -\sqrt{x+5} \rightarrow f(x) = \sqrt{x+5} ; -f(x)$



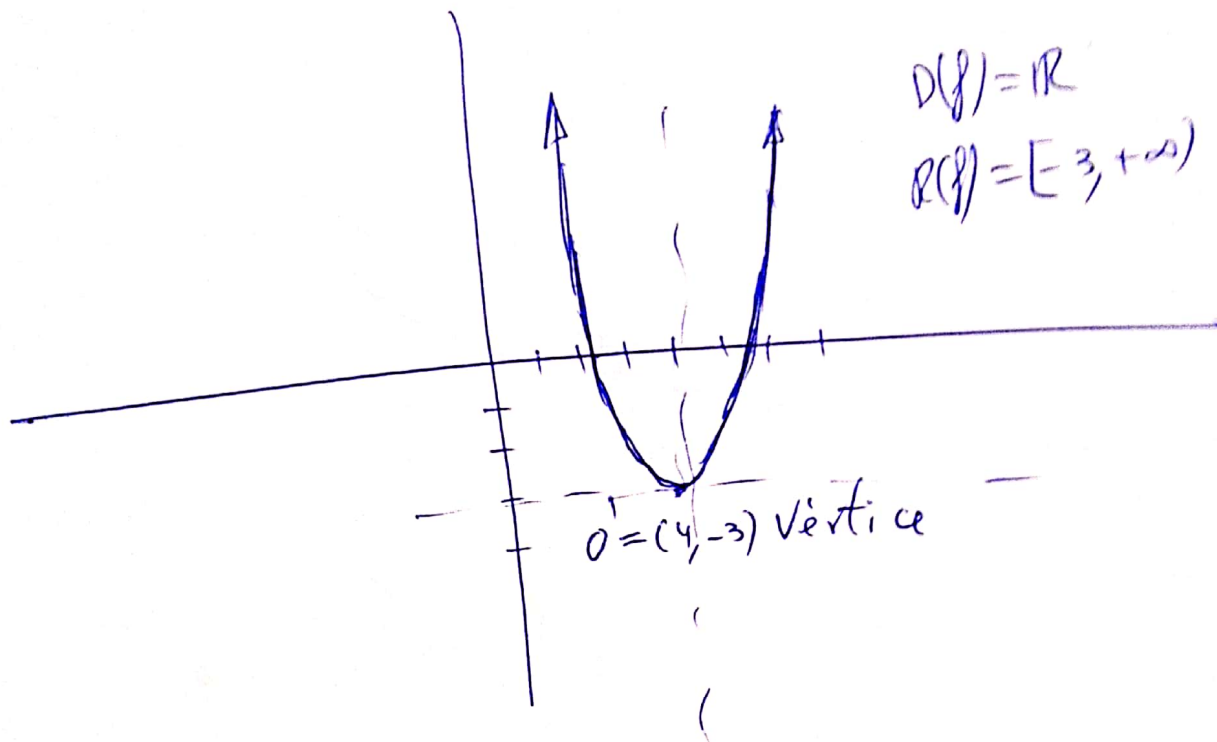
e)  $y = -1 + \sqrt{x+3} \rightarrow O' = (-3, -1)$





$$f) \quad y = x^2 \rightarrow y = (x+h)^2 + v \quad o' = (-h, v)$$

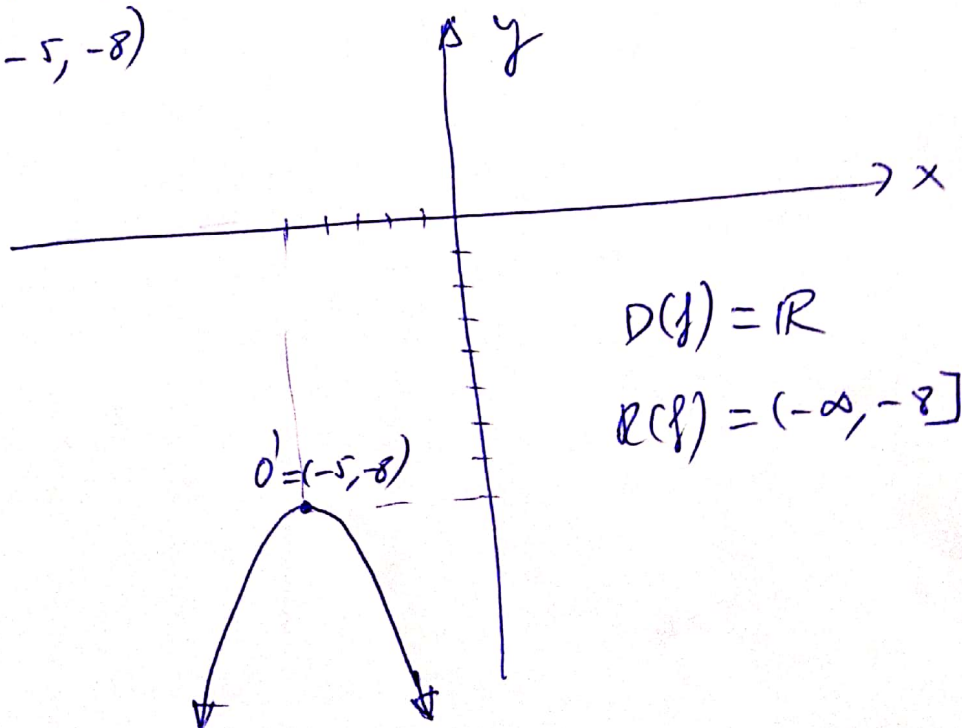
$$y = (x-4)^2 - 3 \rightarrow o' = (4, -3)$$



$$g) \quad y = -(x+5)^2 - 8 = -[(x+5)^2 + 8]$$

$$o' \quad f(x) = (x+5)^2 + 8 \rightarrow -f(x) = -(x+5)^2 - 8$$

$$o' = (-5, -8)$$

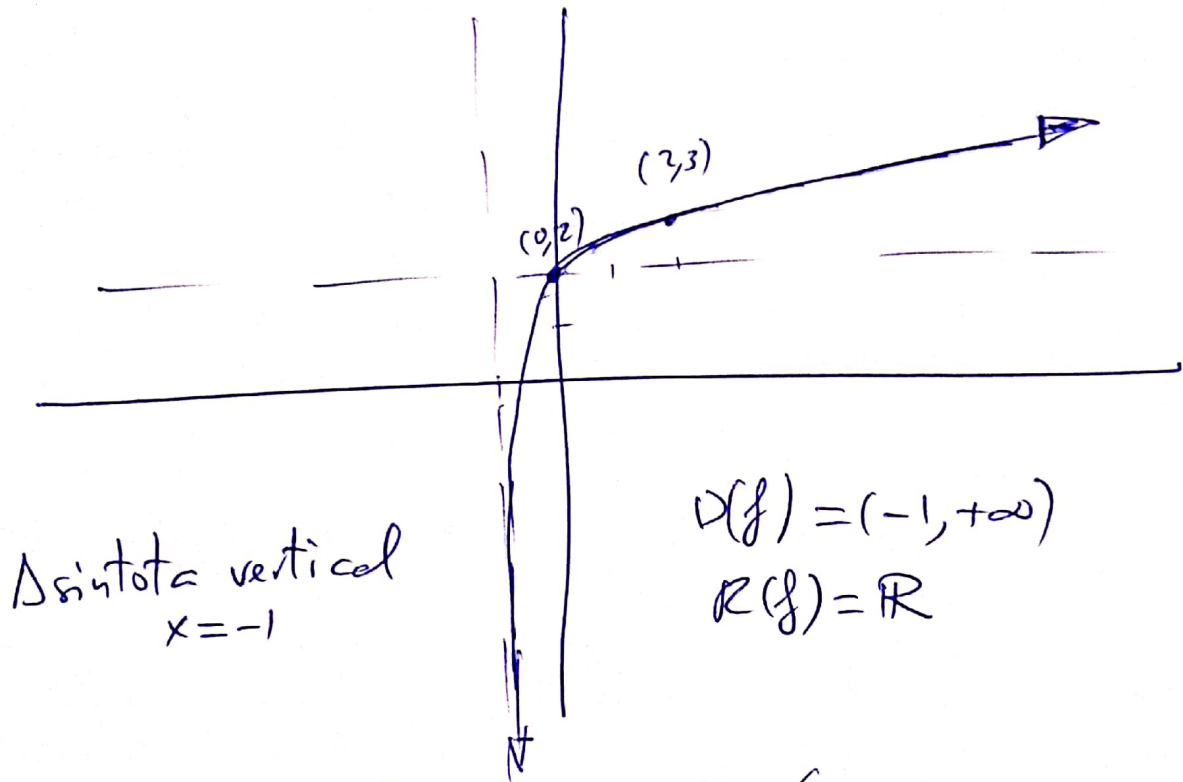


$$h) \quad y = 2 + \log_3(x+1) \rightarrow y = v + \log_3(x+h)$$

$$y = \log_3 x$$

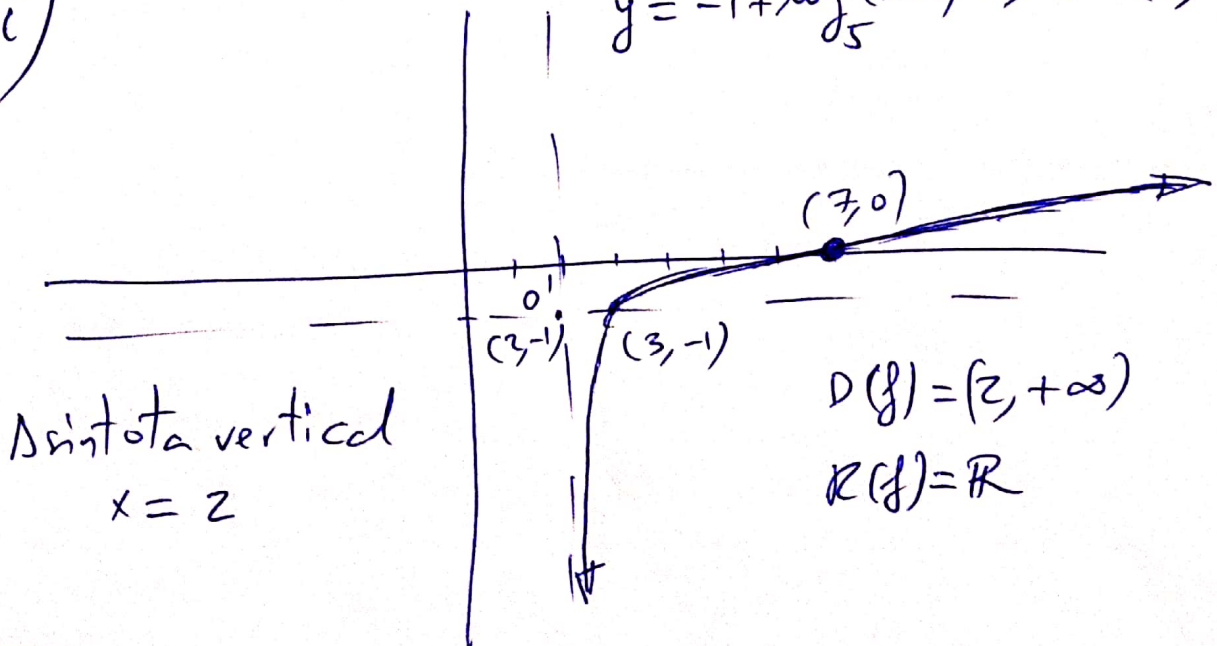
$$y = \log_b x$$

$$O' = (-h, v) = (-1, 2)$$



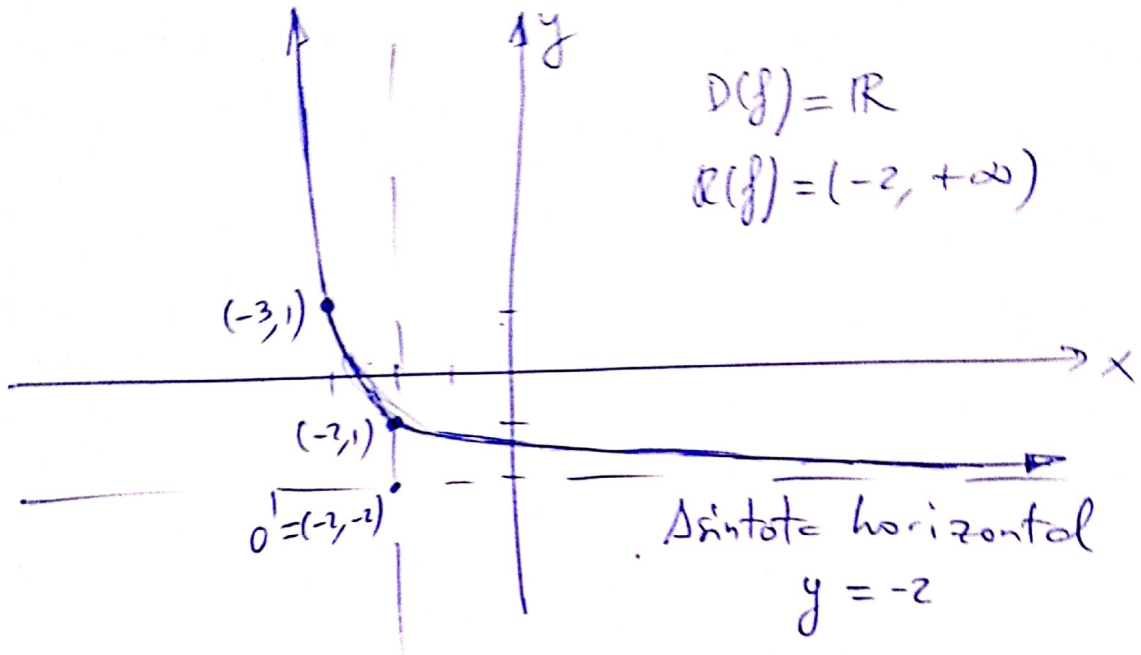
i)

$$y = -1 + \log_5(x-2) \rightarrow O' = (2, -1)$$



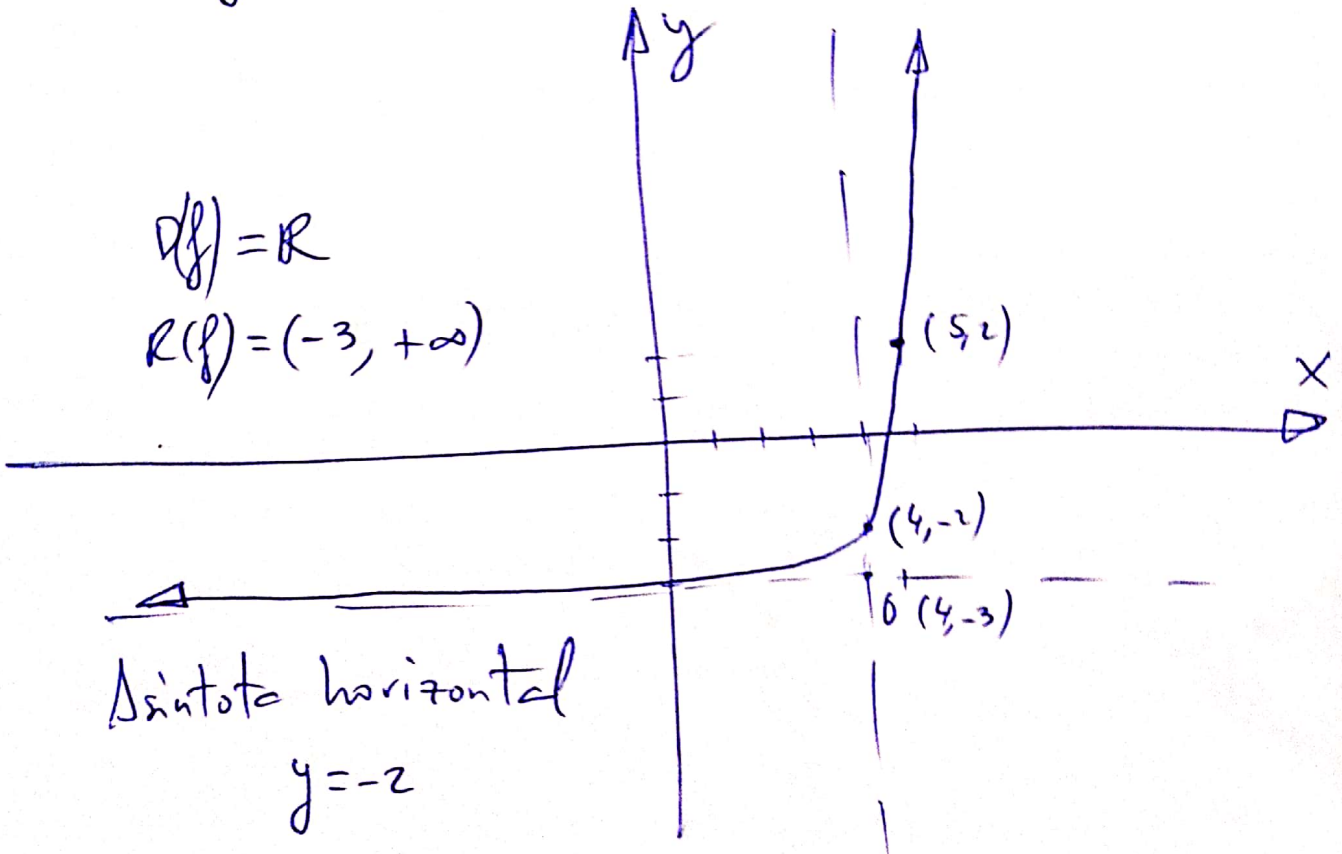
j)

$$y = -2 + \left(\frac{1}{3}\right)^{x+2} \rightarrow O' = (-2, -2)$$



k)

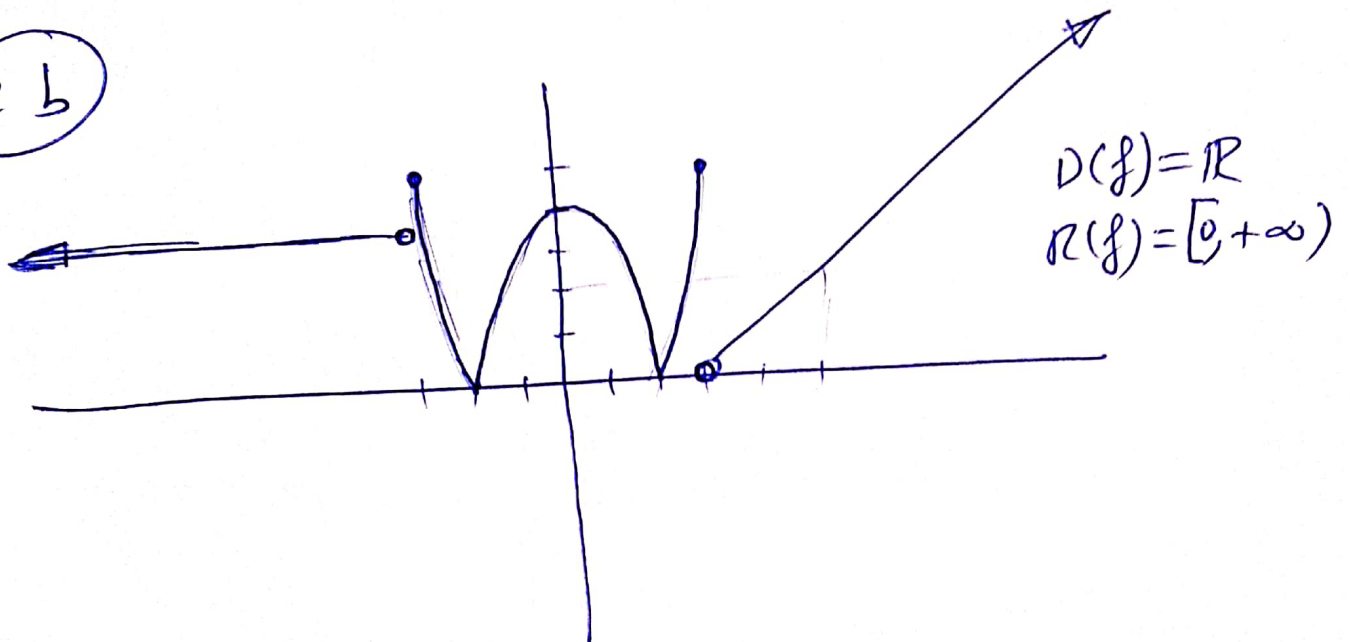
$$y = -3 + 5^{x-4} \rightarrow O' = (4, -3)$$



④ Definición de módulo ou valor absoluto dunha función  $y = f(x)$

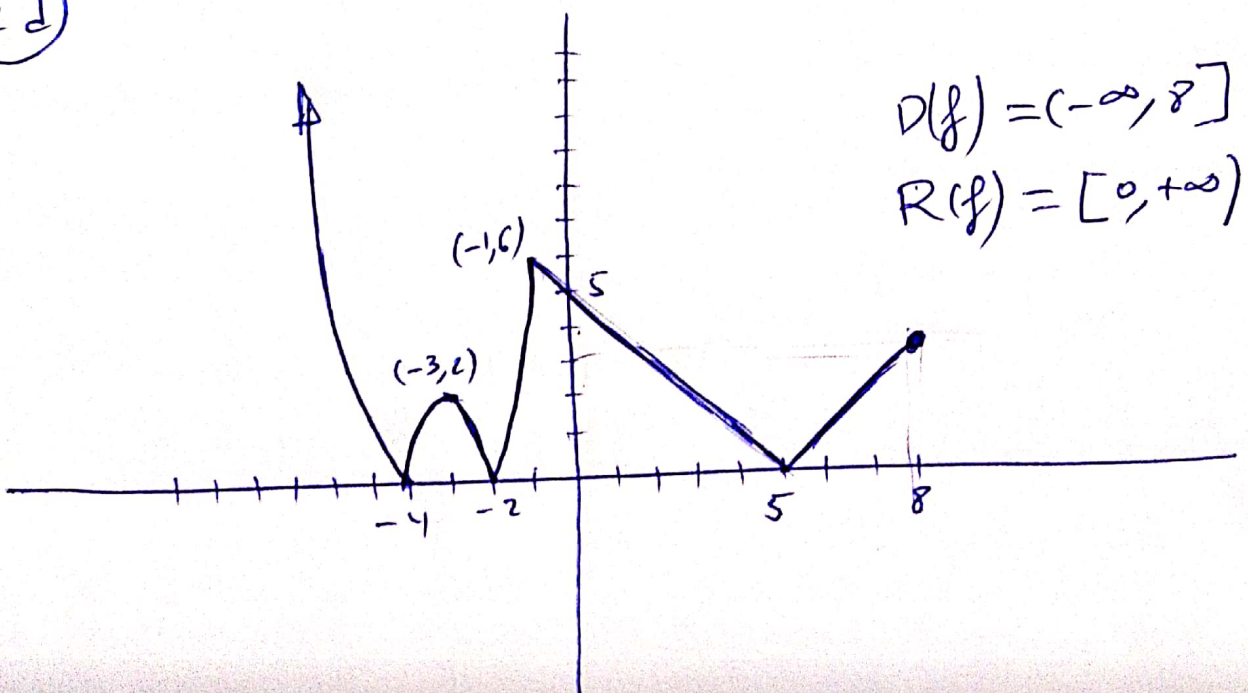
$$|f(x)| = \begin{cases} f(x) & \text{se } f(x) \geq 0 \\ -f(x) & \text{se } f(x) < 0 \end{cases}$$

2b

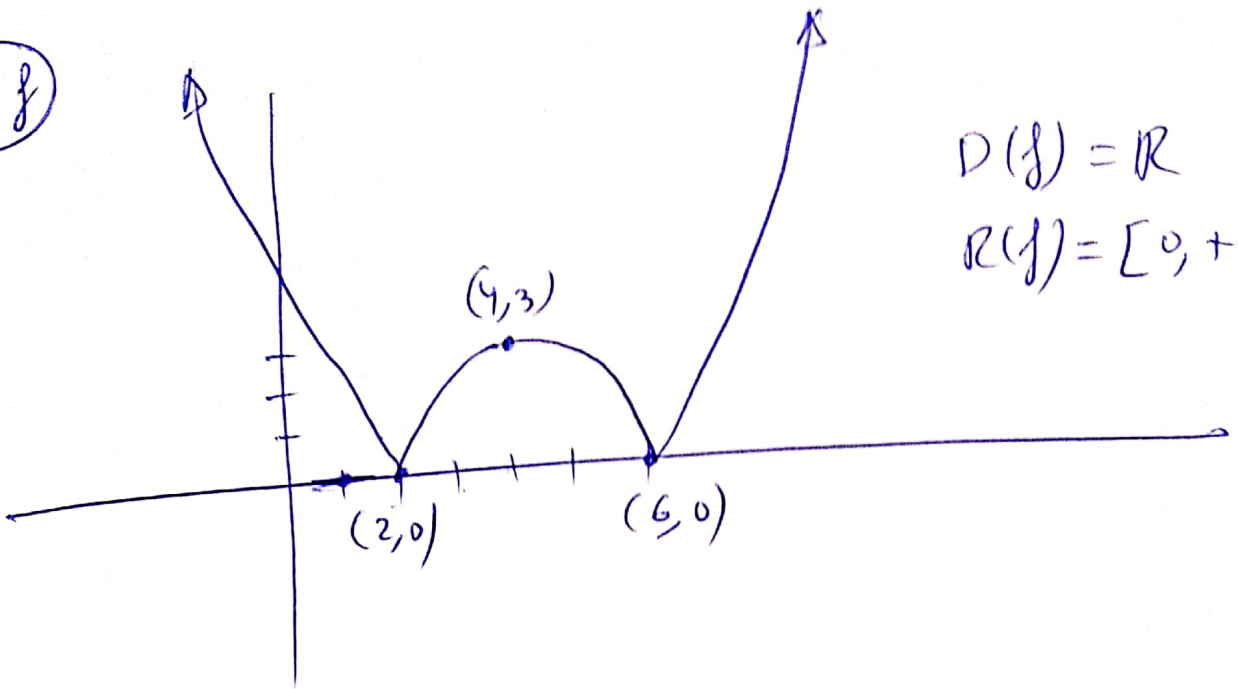


2c coincide  $f(x)$  con  $|f(x)|$  por ser  $f(x) > 0$

2d



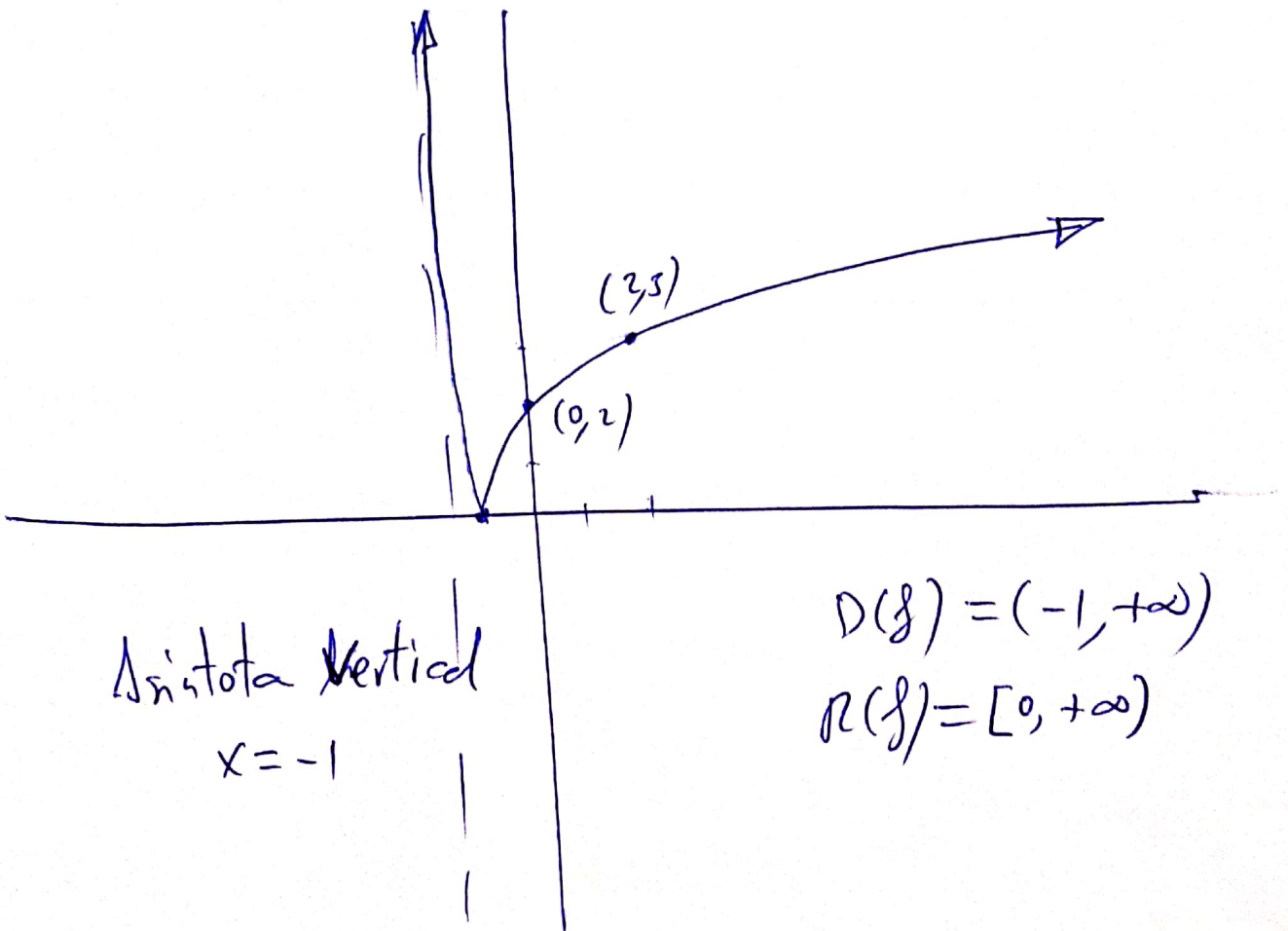
3f



$$D(f) = \mathbb{R}$$

$$R(f) = [0, +\infty)$$

3h



$$D(f) = (-1, +\infty)$$

$$R(f) = [0, +\infty)$$