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Ejercicio 1

$$f(x) = \begin{cases} x, & x \in (-7, 3) \\ \sqrt{x+3}, & x \in [-3, 6) \\ |x-6|, & x \in [6, 10) \end{cases}$$

$$|x-6| = \begin{cases} x-6, & x \geq 6 \\ 6-x, & x < 6 \end{cases}$$

$$f(x) = \begin{cases} x, & x \in (-7, 3) \\ \sqrt{x+3}, & x \in [-3, 6) \\ x-6, & x \in [6, 10) \end{cases}$$

$$f \circ g(x) = \begin{cases} 2x+2, & x \in (-7, 3) \\ \sqrt{x+3} + 2 + x, & x \in [-3, 6) \\ 2x-4, & x \in [6, 9) \end{cases}$$

Para  $x = -2$  en  $f \circ g$   $x = -3$

$$\begin{array}{l} 2(-2)+2 \\ -1+2 \\ -1 \end{array} \quad \begin{array}{l} 2(-3)+2 \\ -6+2 \\ -4 \end{array}$$

$x = -3$   
Para  $\sqrt{x+3} + 2 + x$  en  $f \circ g$

$$\begin{array}{l} \sqrt{-3+3} + 2 + (-3) \\ 0 + -1 \\ -1 \end{array}$$

Para  $x = 0$

$$\begin{array}{l} \sqrt{0+3} + 2 + 0 \\ \sqrt{3} + 2 \end{array}$$

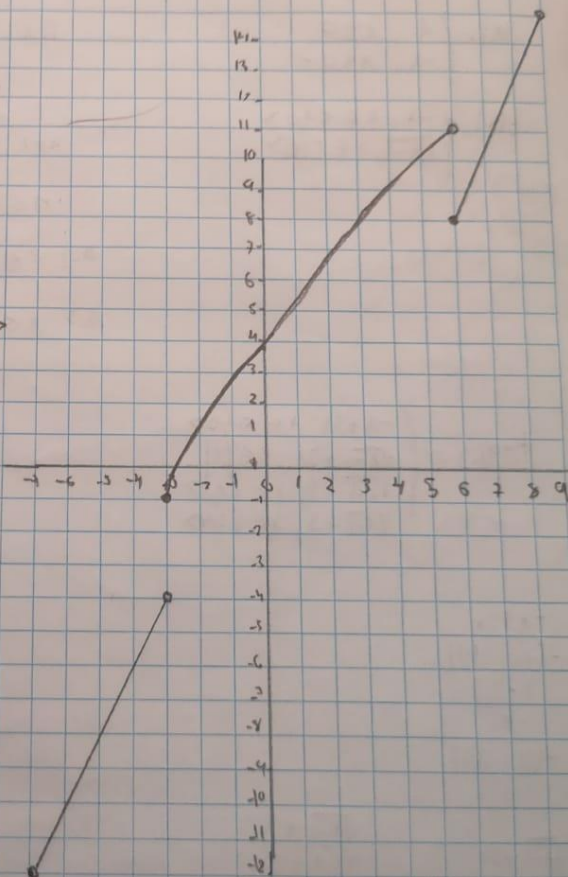
$$\begin{array}{l} 2x-4 \\ 2(0)-4 \\ -4 \end{array}$$

$$\begin{array}{l} 2(4)-4 \\ 4 \end{array}$$

Para  $x = 6$

$$\begin{array}{l} \sqrt{6+3} + 2 + 6 \\ \sqrt{9} + 8 \\ 11 \end{array}$$

$$g(x) = 2+x, \text{ si } x \in (-\infty, 9)$$



$$\text{Dom} = (-7, 9)$$

$$\text{Rango} = (-12, -4) \cup [-1, -11)$$

Ejercicio 02

$$f(x) = \begin{cases} |x|, & x \in <-1, 0> \\ \sqrt{x-1}, & x \in [1, 10> \end{cases}$$

$$|x| = \begin{cases} x, & x \geq 0 \\ -x, & x < 0 \end{cases}$$

$$f(x) = \begin{cases} -x, & x \in <-1, 0> \\ \sqrt{x-1}, & x \in [1, 10> \end{cases}$$

$$g(x) = \begin{cases} 3x, & x \in <-1, 1] \\ \lfloor x \rfloor, & x \in [2, 4> \end{cases}$$

$\mathbb{R} \times \mathbb{R}$

$$2 \leq x < 4$$

$$n=2, 3$$

$$n \leq x \leq n+1$$

$$n=2 \quad 2 \leq x \leq 3$$

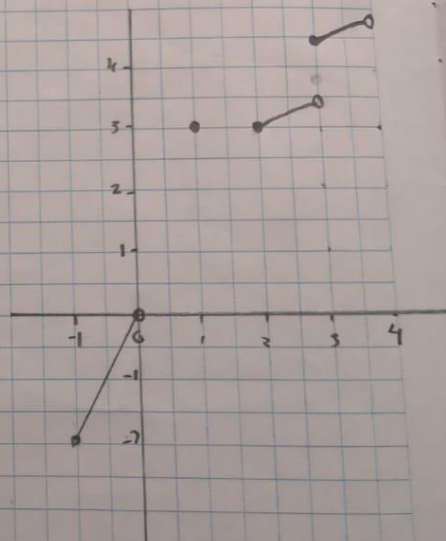
$$n=3 \quad 3 \leq x < 4$$

$$g(x) = \begin{cases} 3x, & x \in <-1, 1] \\ 2, & 2 \leq x < 3 \\ 3, & 3 \leq x < 4 \end{cases}$$

$$f+g(x) = \begin{cases} -x+3x, & x \in <-1, 0> \\ \sqrt{x-1}+3x, & x \in [1, 1] \\ \sqrt{x-1}+2, & x \in [2, 3) \\ \sqrt{x-1}+3, & x \in [3, 4) \end{cases}$$

$$\begin{aligned} -x+3x \\ -(-1)+3(-1) \\ 1-3 \\ -2 \\ -(0)+3(0) \\ 0 \end{aligned}$$

$$\begin{aligned} \sqrt{x-1}+3x & \quad \sqrt{x-1}+3 \\ \sqrt{1-1}+3(1) & \quad \sqrt{3-1}+3 \\ 3 & \quad \sqrt{2}+3 \\ \sqrt{1-1}+2 & \quad \sqrt{4-1}+3 \\ \sqrt{2-1}+2 & \quad \sqrt{3}+3 \\ 3 & \\ \sqrt{3-1}+2 & \\ \sqrt{2}+2 & \end{aligned}$$



$$\text{Dom.} = <-1, 0> \cup \{1\} \cup [2, 4>$$

$$\text{Rango} = <-2, 0> \cup \{3, 2+\sqrt{2}\} \cup [3+\sqrt{2}, 3+\sqrt{3}>$$

Convergence fiddle Alex Elt

①  $f(x) = x \quad x \in \langle -7, -3 \rangle$

$y = x \quad x \in \langle -7, -3 \rangle$

$f(x) = \sqrt{x+3} \quad x \in [-3, 6]$

$y = \sqrt{x+3}$

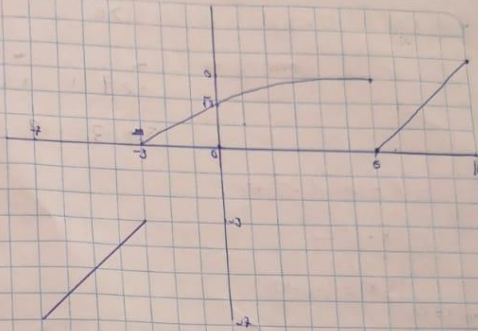
$x+3 \geq 0 \Rightarrow y = \sqrt{-3+3}$   
 $x \geq -3 \quad y = 0$

$y = \sqrt{0+3}$

$y = \sqrt{3}$

$y = \sqrt{6+3}$

$y = 3$



$|x-6| \in [6, 10]$

~~$|x-6| > 0$~~   
 ~~$x-6 > 0$~~   
 ~~$x > 6$~~

~~$|x-6| < 0$~~   
 ~~$6-x < 0$~~   
 ~~$x < 6$~~

$|x-6| \begin{cases} x-6 > 0 & x > 6 \checkmark \\ 6-x < 0 & x < 6 \text{ No sample} \end{cases}$

$f(x) = x-6$

$y = x-6$

$y = 6-6$

$y = 0$

$y = 10-6$

$y = 4$

$\text{Dom} = [-7, 10]$

$\text{Range} = [-7, 3] \cup [0, 4]$

②  $f(x) = \left\lceil \frac{x+6}{3} \right\rceil, x \in \langle 3, 9 \rangle$

$= 3 \leq x < 9$

$n = 3, 4, 5, 6, 7$

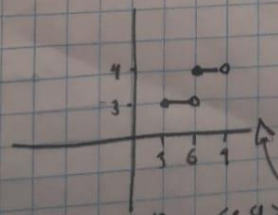
$n \leq \frac{x+6}{3} < n+1$

$3n \leq x+6 < 3n+3$

$3n-6 \leq x < 3n-3$

$n=3$	$3 \leq x < 6$
$n=4$	$6 \leq x < 9$
$n=5$	$9 \leq x < 12$
$n=6$	$12 \leq x < 15$
$n=7$	$15 \leq x < 18$
$n=8$	$18 \leq x < 21$
$n=9$	$21 \leq x < 24$

No sample



$\text{Dom} = \langle 3, 9 \rangle$

$\text{Range} = \{3, 4\}$

Classic



②  $f(x) = x^2 + 10x + 21$  si  $|x-3| > 6$

$$|x+3| > 6 \Leftrightarrow \begin{cases} x+3 > 6 & \vee & x+3 < -6 \\ x > 3 & \vee & x < -9 \end{cases}$$

$$\Leftrightarrow (-\infty, -9) \cup (3, +\infty)$$

$$x^2 + 10x + 5^2 - 5^2 + 21$$

$$(x+5)^2 - 4$$

$$(h, k) = (-5, -4)$$

Para  $x = -3$

$$y = (-3+5)^2 - 4$$

$$y = 0$$

Para  $x = 9$

$$y = (9+5)^2 - 4$$

$$y = 21$$

Para  $x = 9$

$$y = (9+5)^2 - 4$$

$$y = 14^2 - 4$$

$$y = 192$$

Para  $y = 0$

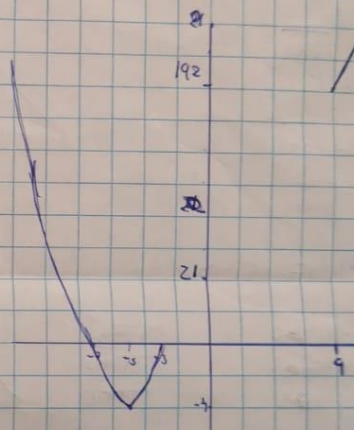
$$0 = (x+5)^2 - 4$$

$$4 = (x+5)^2$$

$$\pm 2 = x+5$$

$$x = -7$$

$$x = -3$$



$$\text{Dom. } (-\infty, -3) \cup (9, +\infty)$$

$$\text{Rang. } (-4, +\infty)$$

③  $f(x) = \left\lceil \frac{x+6}{3} \right\rceil$

$$n \leq \frac{x+6}{3} < n+1$$

$$3n \leq x+6 < 3n+3$$

$$3n-6 \leq x < 3n-3$$

$$x \in [3n-6, 3n-3)$$

$$3n-6 \leq x \vee 3 < 3n-3$$

$$3n \leq 9 \quad 6 \leq 3n$$

$$n \leq 3 \quad 2 < n$$

$$3n-6 \leq x < 3n-3$$

$$3(3) - 6 \leq x < 3(3) - 3$$

$$3 \leq x < 6$$

$$3(4) - 6 \leq x < 3(4) - 3$$

$$6 \leq x < 9$$

