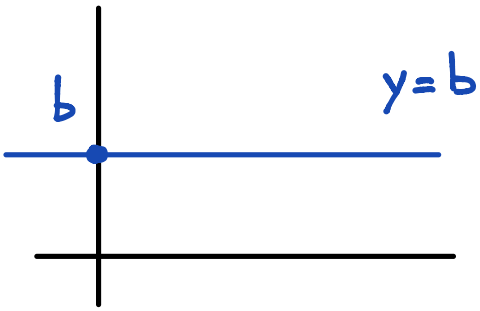
CLASE 10: GRÁFICA DE FUNCIONES

- $f(x) = mx + b$, $\text{Dom } f = \mathbb{R}$

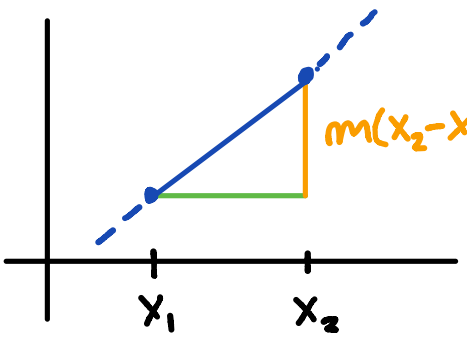
  - Caso particular: $m = 0 \Rightarrow f(x) = b \quad \forall x \in \mathbb{R}$



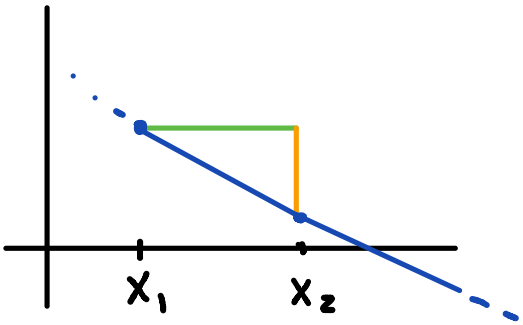
  - Caso general: $f(x) = mx + b$

$x_1 < x_2$, $\dfrac{f(x_2) - f(x_1)}{x_2 - x_1} = \dfrac{m(x_2 - x_1)}{x_2 - x_1} = m$

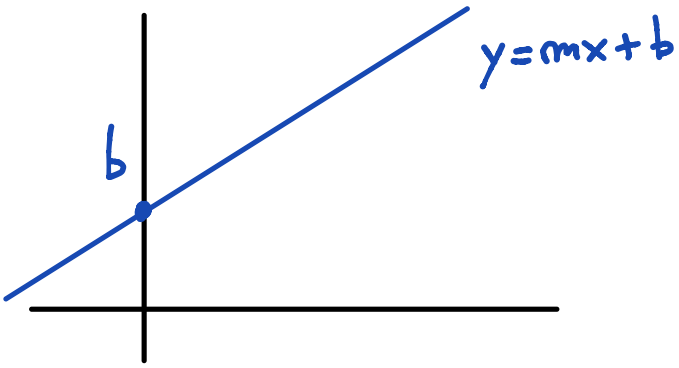
$m > 0$



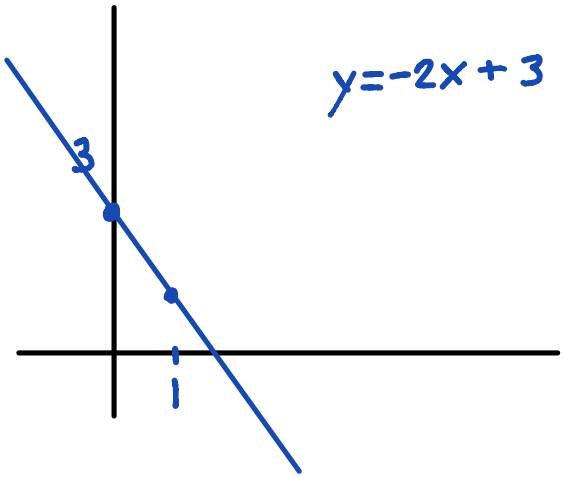
$m < 0$



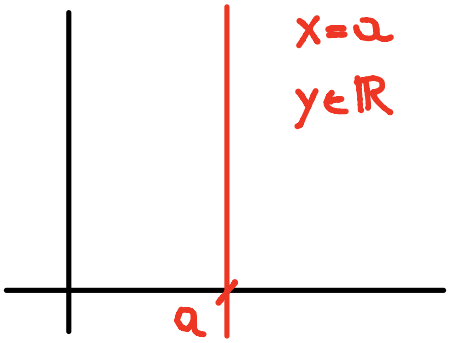
$f(0) = m \cdot 0 + b = b$



- Ej: $f(x) = -2x + 3$



- Obs:

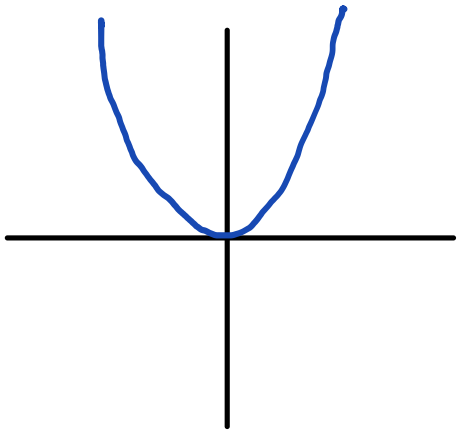


Si la recta es vertical, y no es una función de x

- $f(x) = x^n$, $n \geq 2$ entero

  $\text{Dom } f = \mathbb{R}$

n par



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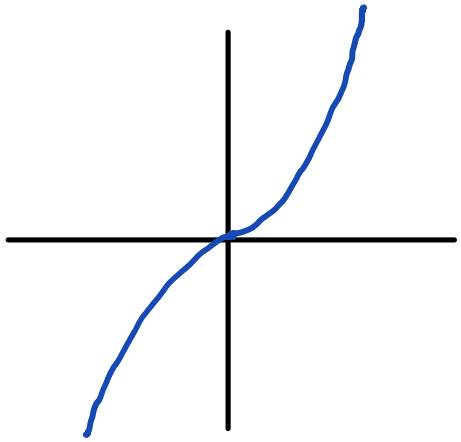
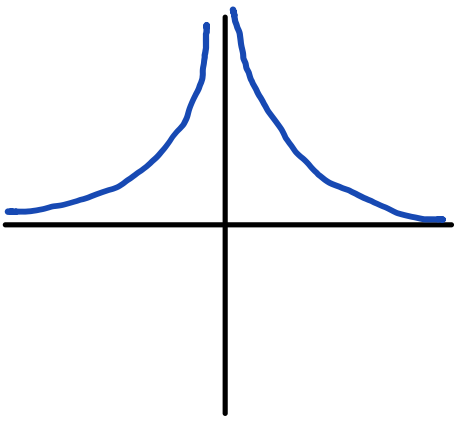


- $f(x) = x^{-n} = \frac{1}{x^n}$, $n \geq 1$ entero

  $\text{Dom } f = \mathbb{R} \setminus \{0\} = \{x \in \mathbb{R} : x \neq 0\}$

n par



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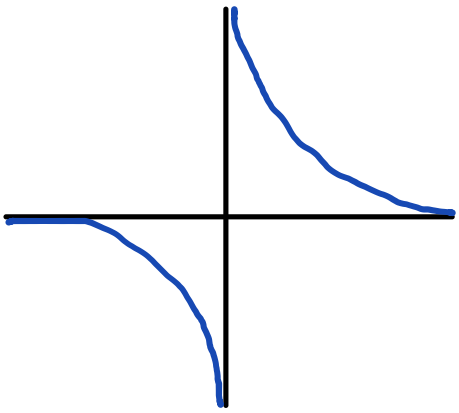
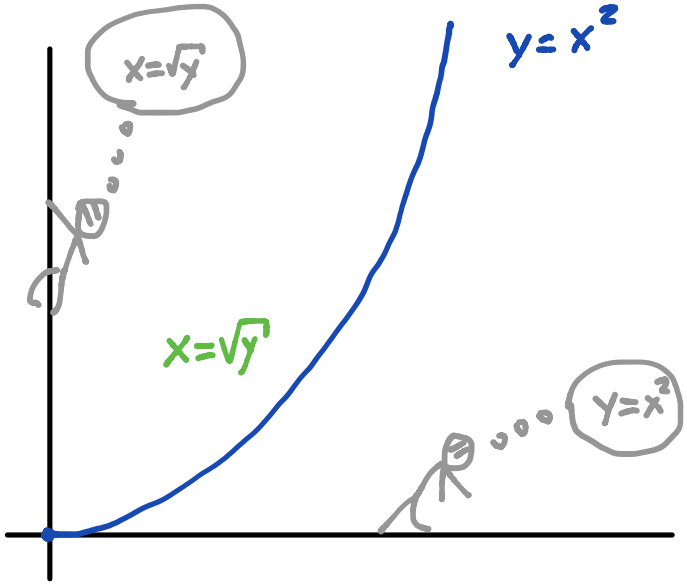
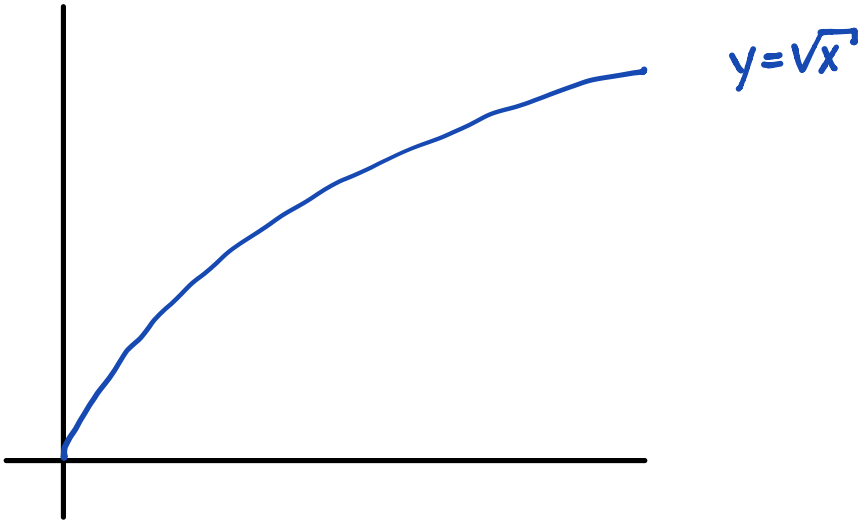


- $f(x) = \sqrt{x}$, $\text{Dom } f = [0, \infty)$

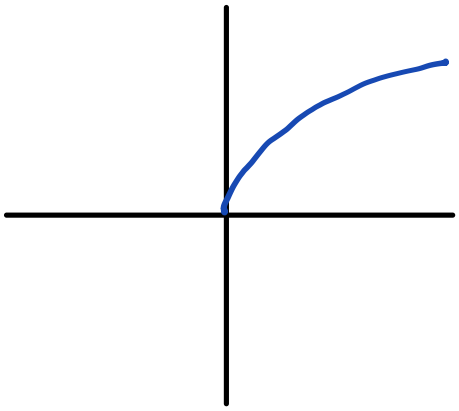




- $f(x) = x^{\frac{1}{n}}$, $n \geq 2$ enteros

n par

$\text{Dom} f = [0, \infty)$



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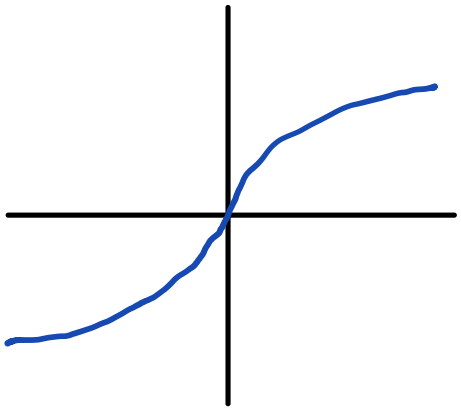
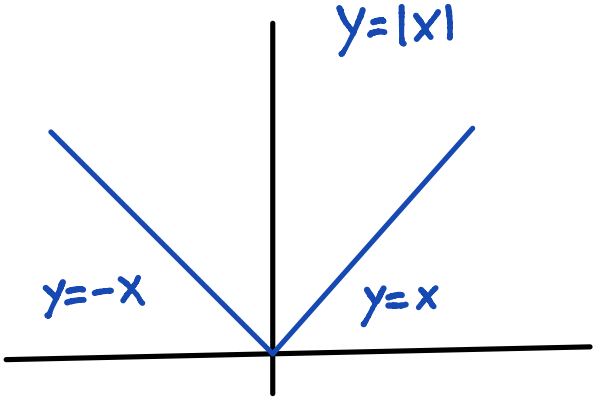
$\text{Dom} f = \mathbb{R}$



- Ej: $f(x) = |x|$, $\text{Dom} f = \mathbb{R}$

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



• TRANSFORMACIONES DE FUNCIONES

• Objetivo: Conociendo la gráfica de $y = f(x)$, graficar $y = A f(\omega(x-h)) + B$

• Ej: Graficar $y = 3 - \sqrt{4-2x}$ conociendo la gráfica de $y = \sqrt{x}$.

• Tipos de transformaciones

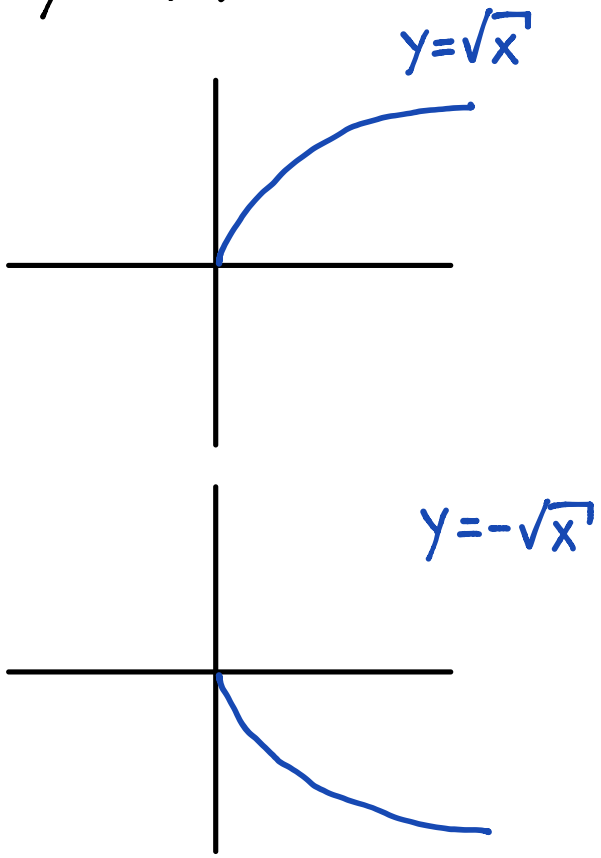
1.- Reflexión $\begin{cases} \text{c/r } x : y = -f(x) \\ \text{c/r } y : y = f(-x) \end{cases}$

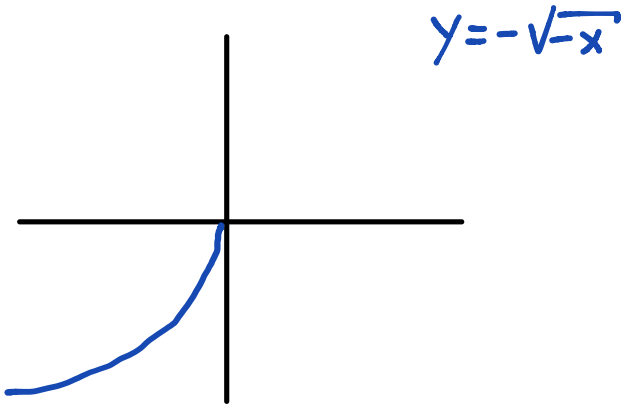
2.- Traslaciones $\begin{cases} \text{verticales} : y = f(x) + k \\ \text{horizontales} : y = f(x-h) \end{cases}$

3.- Elongaciones / Compresiones

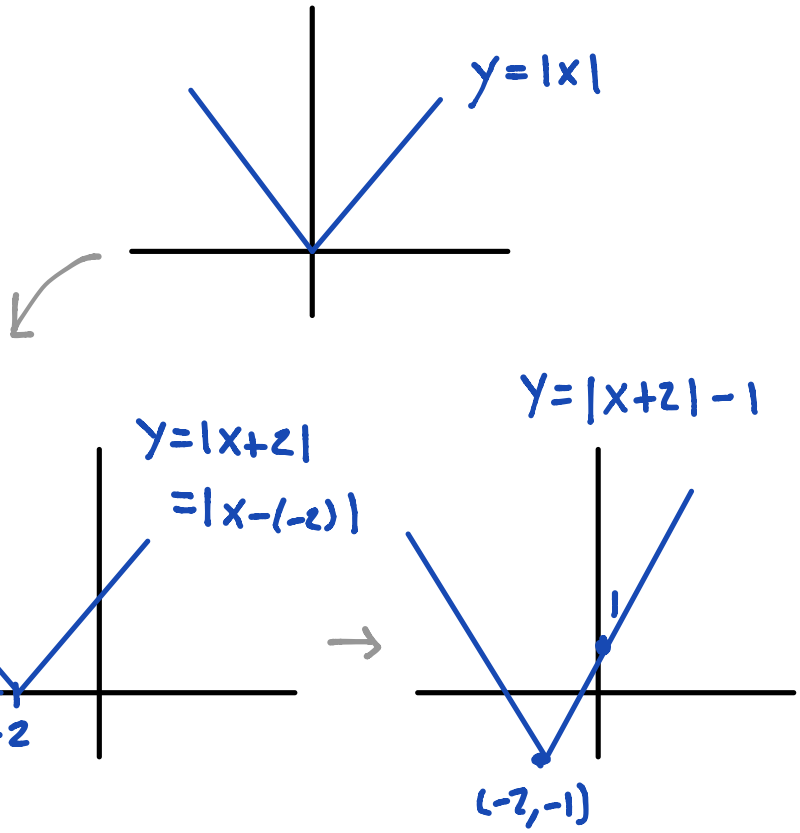
- verticales: $y = A f(x)$
- horizontales: $y = f(wx)$

- Ej: $y = -\sqrt{-x}$



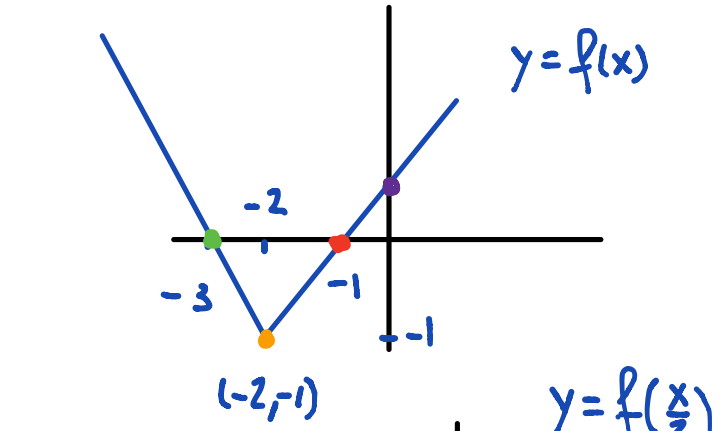


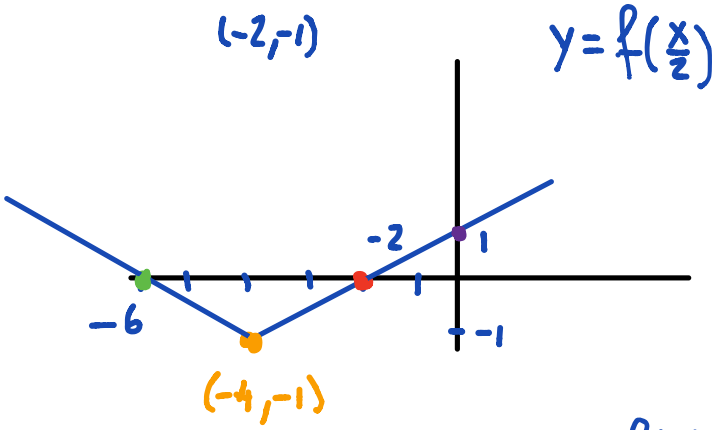
- Ej: $f(x)=|x+2|-1$

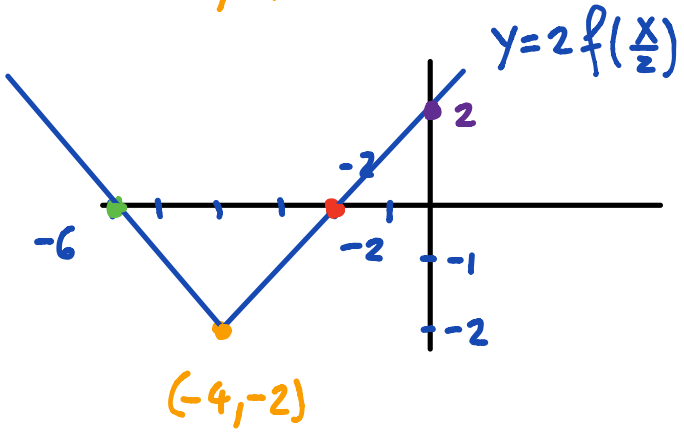


- Ej: $f(x) = |x+2| - 1$

Graficar $y = 2f\left(\frac{x}{2}\right)$







- Orden: 1.- Reflexiones
  2.- Compresiones/
  dilataciones
  3.- Traslaciones