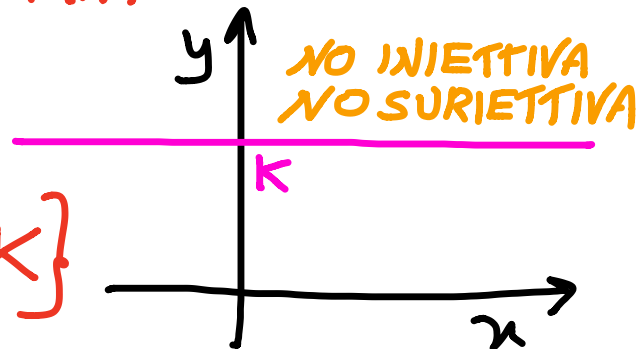


FUNZIONE COSTANTE

$$f(x) = k$$

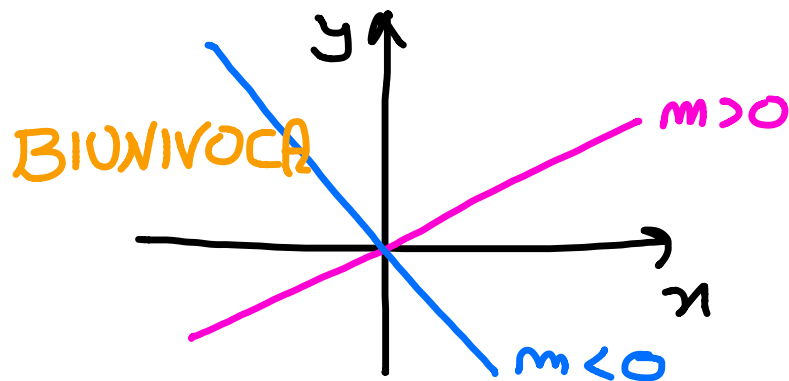
$$D = \mathbb{R} \quad \text{Cod} = \{k\}$$



FUNZIONE DI PROPORZIONALITÀ DI RETTA

$$f(x) = m x$$

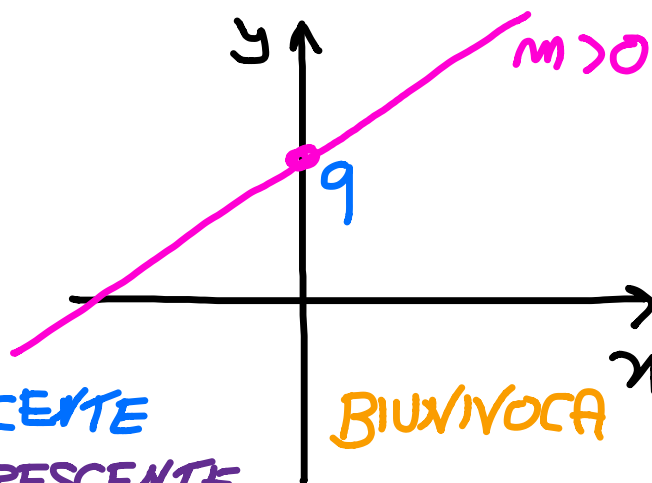
$$D = \mathbb{R} \\ \text{Cod} = \mathbb{R}$$



FUNZIONE LINEARE

$$f(x) = m x + q$$

$$D = \mathbb{R} \\ \text{Cod} = \mathbb{R}$$



$m > 0$ STR. CRESCENTE

$m < 0$ STR. DECRESCENTE

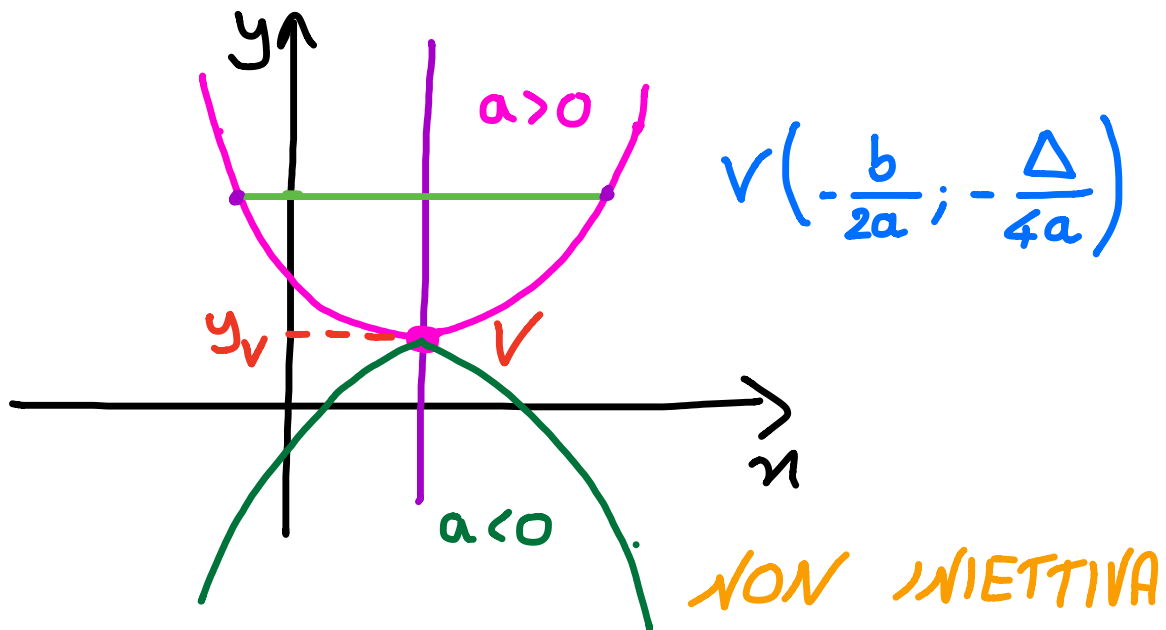
FUNZIONE QUADRATICA (PARABOLA con
ASSE $\parallel \vec{y}$)

$$f(x) = ax^2 + bx + c$$

$$D = \mathbb{R}$$

$$\text{Cod} = [y_v; +\infty[\quad \text{SE } a > 0$$

$$\text{Cod} =]-\infty; y_v] \quad \text{SE } a < 0$$



$$b=0 \quad y = ax^2 + c \Rightarrow V(0; c)$$

$$c=0 \quad y = ax^2 + bx \Rightarrow O(0; 0) \in \pi$$

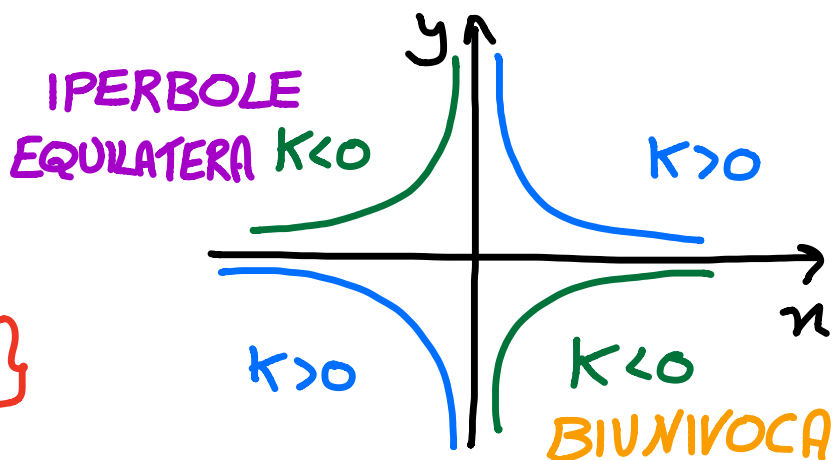
$$b=c=0 \quad y = ax^2 \Rightarrow V(0; 0)$$

FUNZIONE DI PROPORZIONALITÀ INVERSA

$$f(x) = \frac{k}{x}$$

$$D = \mathbb{R} - \{0\}$$

$$\text{Cod} = \mathbb{R} - \{0\}$$



FUNZIONE OMOGRAFICA

$$f(x) = \frac{ax+b}{cx+d}$$

IPERBOLE EQUILATERA
TRASLATA E RUOTATA

$$D = \mathbb{R} - \left\{-\frac{d}{c}\right\}$$

$$\text{Cod} = \mathbb{R} - \left\{\frac{a}{c}\right\}$$

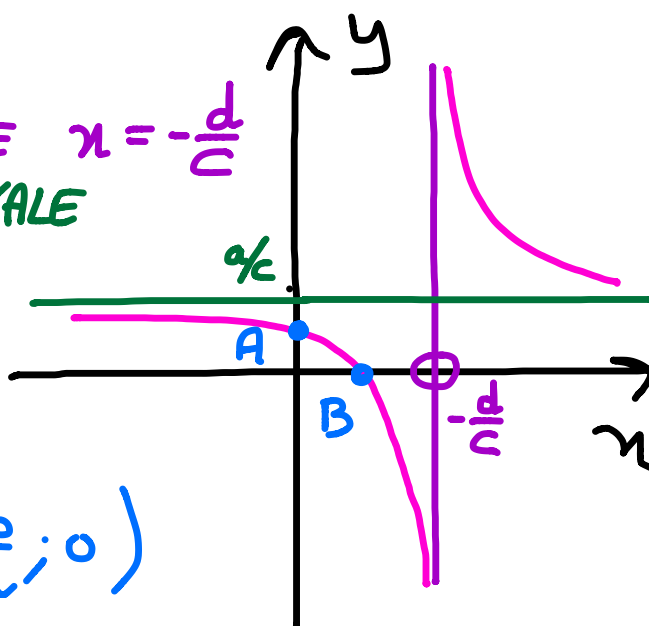
ASINTOTO VERTICALE $x = -\frac{d}{c}$

ASINTOTO ORIZZONTALE

$$y = \frac{a}{c}$$

INTERSEZIONE ASSI

$$A\left(0; \frac{b}{d}\right) \quad B\left(-\frac{b}{a}; 0\right)$$



SEMICIRCONFERENZA

$$f_1(x) = +\sqrt{R^2 - x^2}$$

$$f_2(x) = -\sqrt{R^2 - x^2}$$

$$D = [-R; R]$$

$$\text{Cod}_1 = [0; R]$$

$$\text{Cod}_2 = [-R; 0]$$

DALL'EQUAZIONE

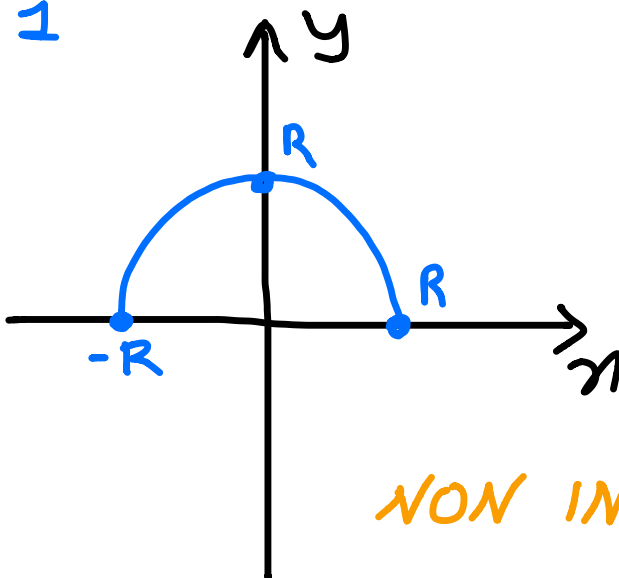
$$x^2 + y^2 = R^2$$

CIRCONFERENZA

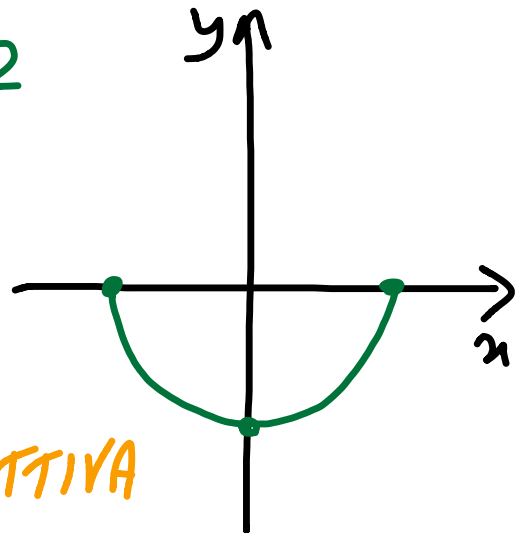
DI CENTRO $(0;0)$

E RAGGIO R

1



2

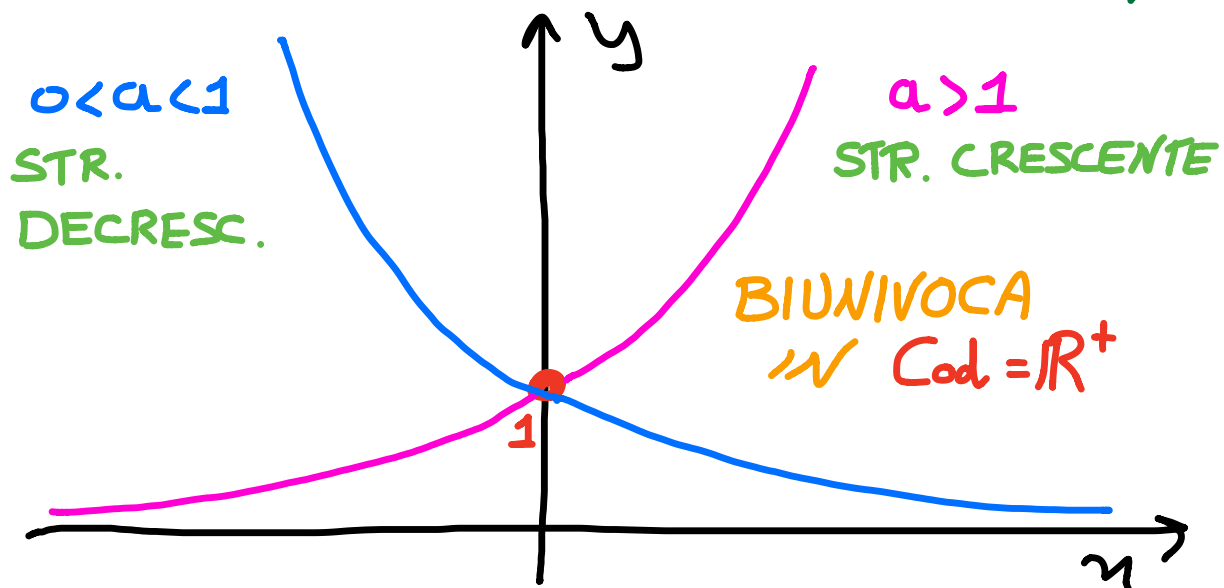


NON INIETTIVA

N.B. LA CIRCONFERENZA NON E' UNA FUNZIONE

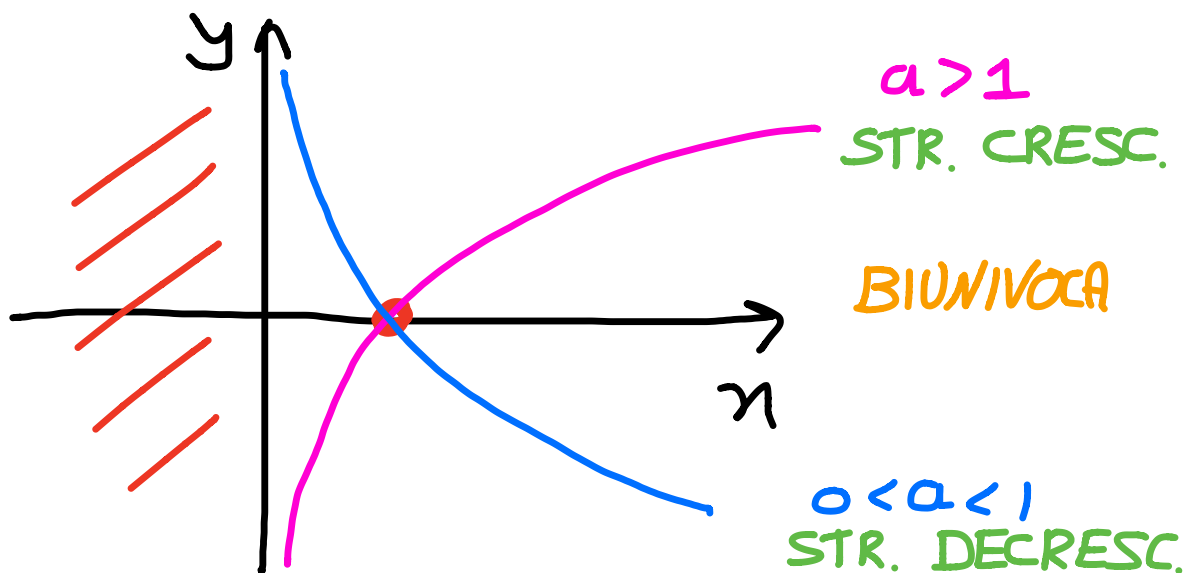
FUNZIONE ESPONENZIALE

$$f(x) = a^x \quad D = \mathbb{R} \quad \text{Cod} =]0; +\infty)$$



FUNZIONE LOGARITMICA

$$f(x) = \log_a x \quad D = \mathbb{R}^+ \quad \text{Cod} = \mathbb{R}$$



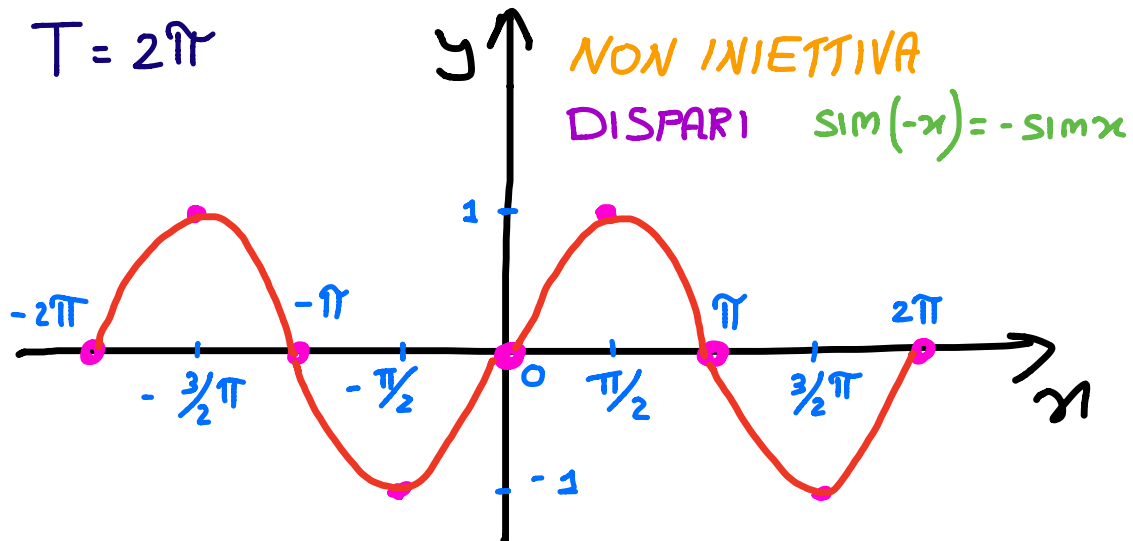
FUNZIONI GONIOMETRICHE

1. $f(x) = \sin x$

$D = \mathbb{R}$

$\text{Cod} = [-1; 1]$

$T = 2\pi$

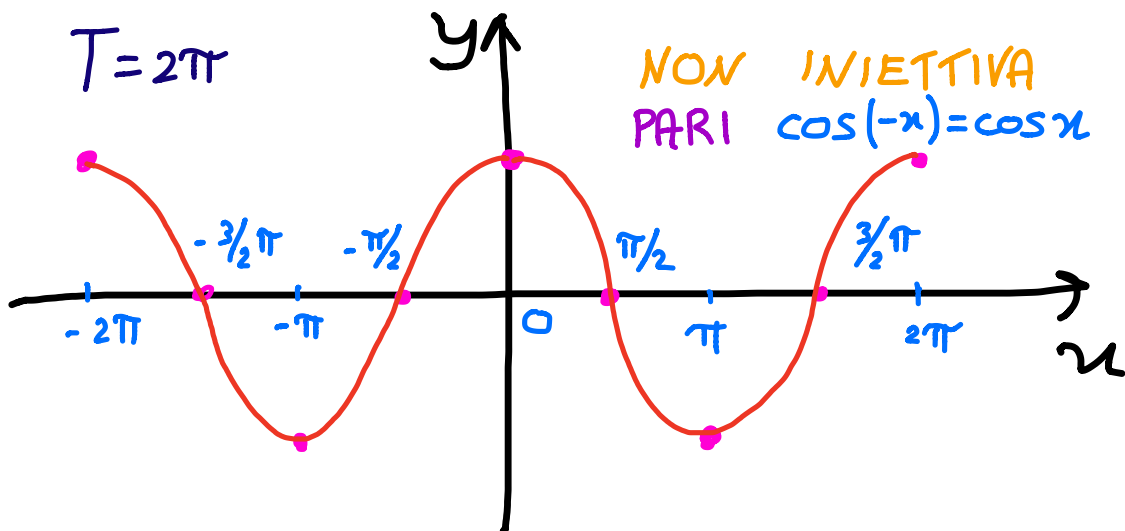


2. $f(x) = \cos x$

$D = \mathbb{R}$

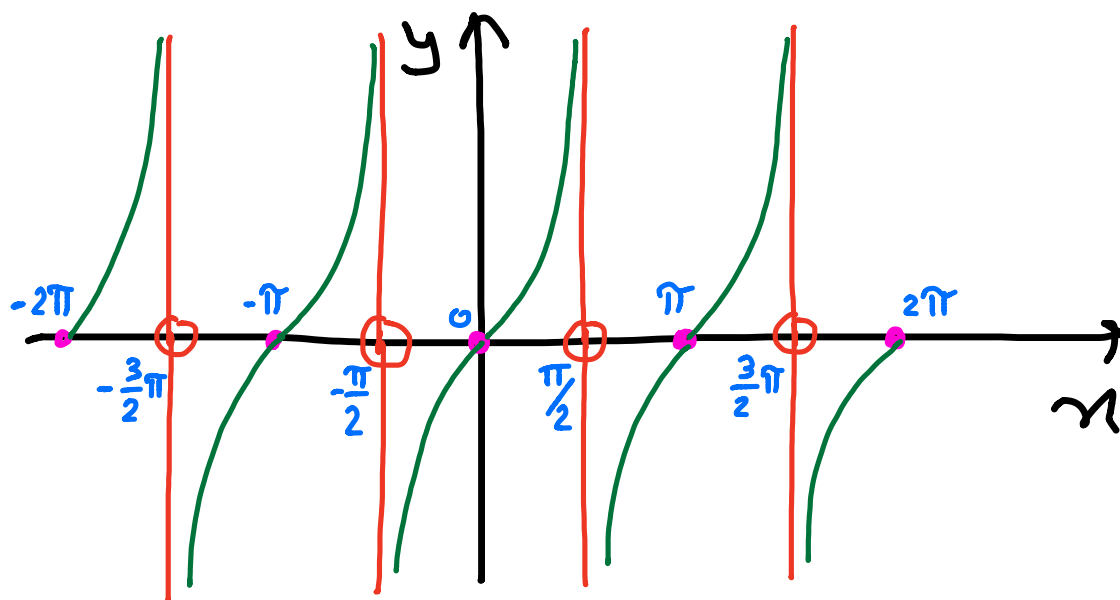
$\text{Cod} = [-1; 1]$

$T = 2\pi$



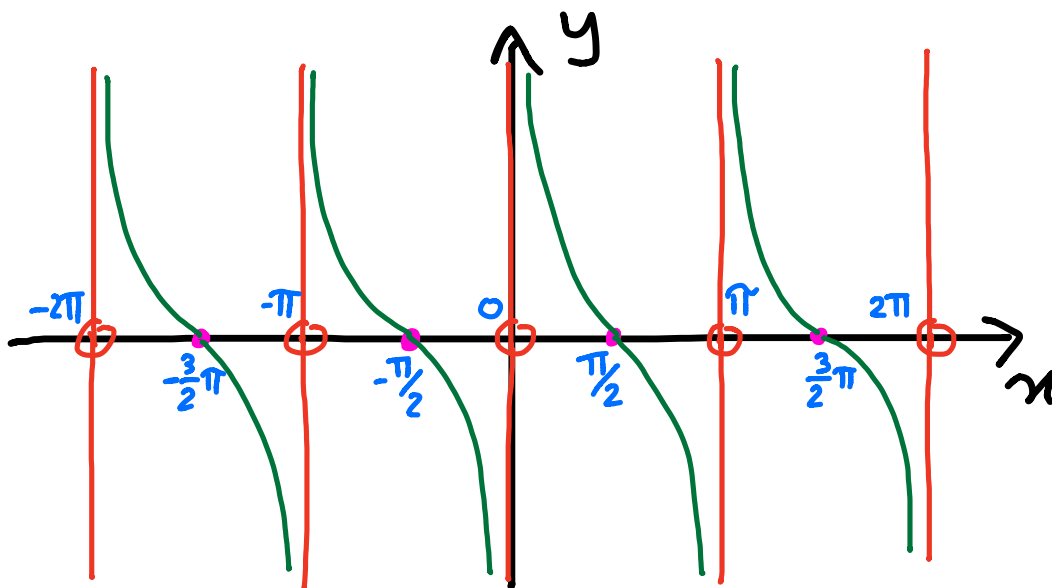
3. $f(x) = \tan x$ $D = \mathbb{R} - \{\frac{\pi}{2} + k\pi\}$

Cod = $\mathbb{R}$ NON INIETTIVA DISPARI



4. $f(x) = \cot x$ $D = \mathbb{R} - \{k\pi\}$

Cod = $\mathbb{R}$ NON INIETTIVA DISPARI



5. $f(x) = \arcsin x$

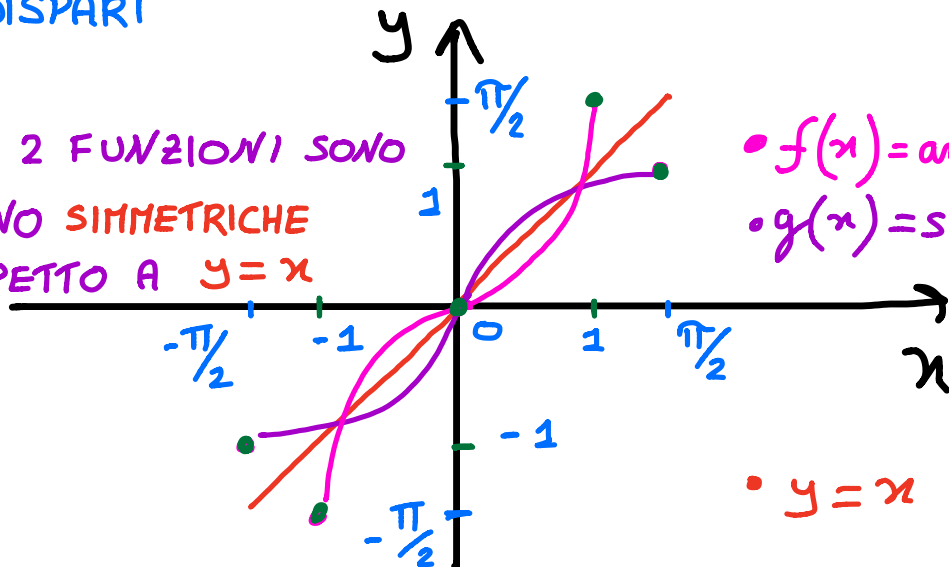
$D = [-1; 1]$

INIETTIVA

DISPARI

$\text{Cod} = \left[-\frac{\pi}{2}; \frac{\pi}{2}\right]$

LE 2 FUNZIONI SONO
SONO SIMMETRICHE
RISPETTO A $y = x$



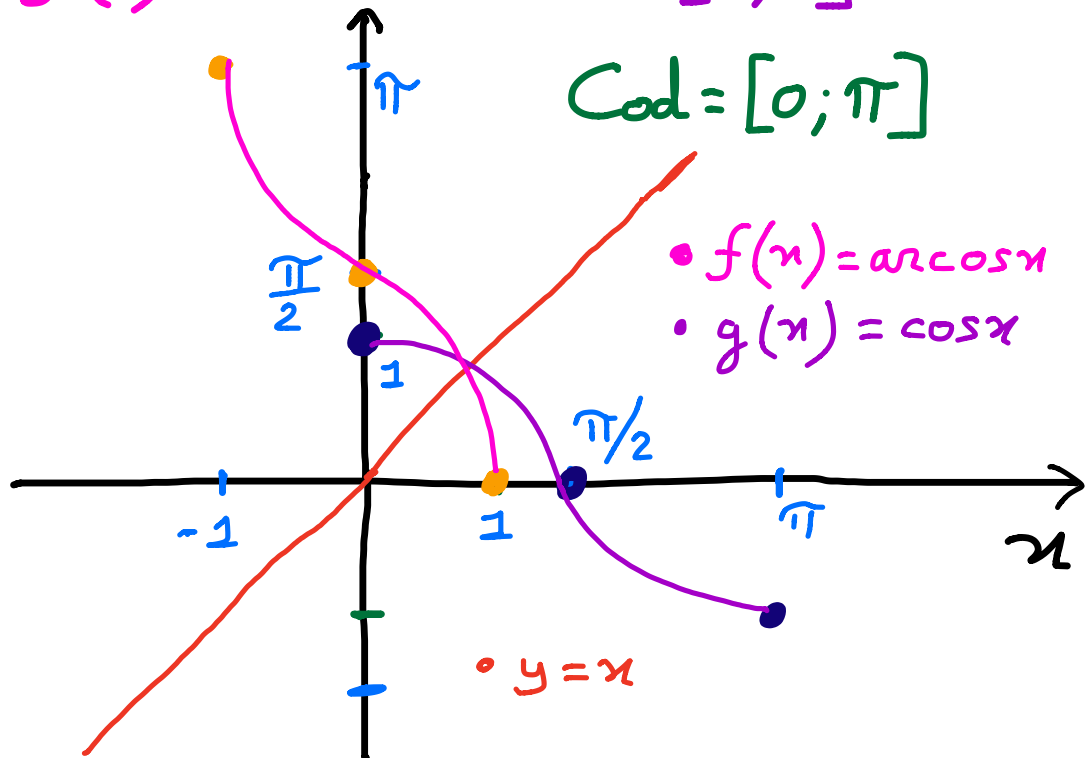
• $f(x) = \arcsin x$
• $g(x) = \sin x$

• $y = x$

6. $f(x) = \arccos x$

$D = [-1; 1]$

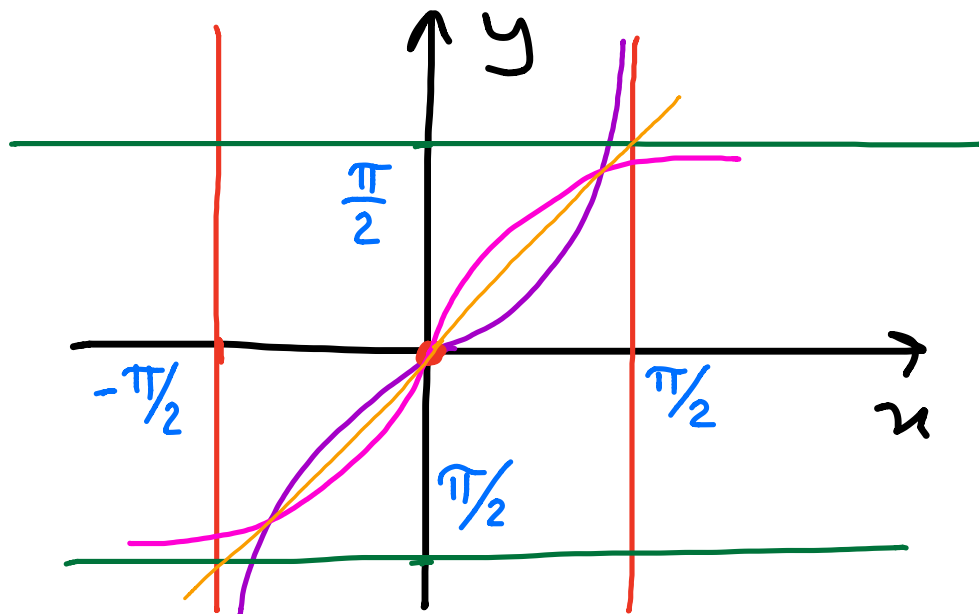
$\text{Cod} = [0; \pi]$



• $f(x) = \arccos x$
• $g(x) = \cos x$

• $y = x$

2. $f(x) = \arctan x$ $D = \mathbb{R}$ $C =]-\frac{\pi}{2}; \frac{\pi}{2}[$

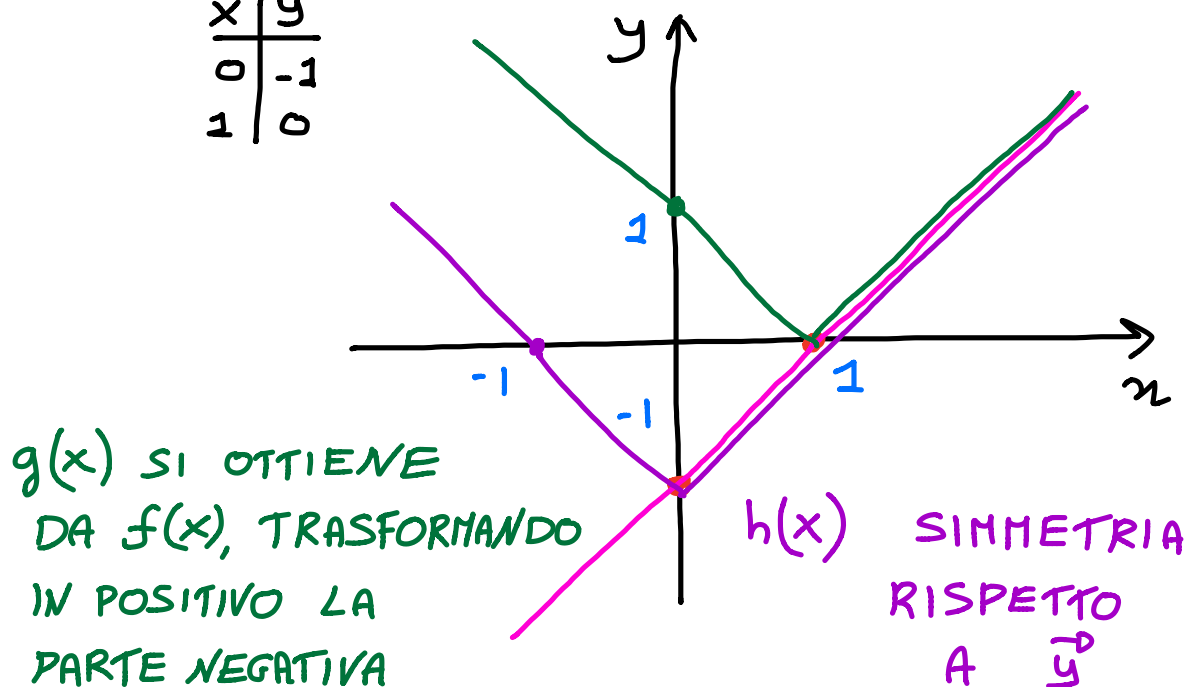


- $f(x) = \arctan x$
- $g(x) = \tan x$

ESEMPI DI GRAFICI CON PARTICOLARI TRASFORMAZIONI

$$f(x) = x - 1 \quad g(x) = |x - 1| \quad h(x) = |x| - 1$$

x	y
0	-1
1	0



GENERALIZZANDO

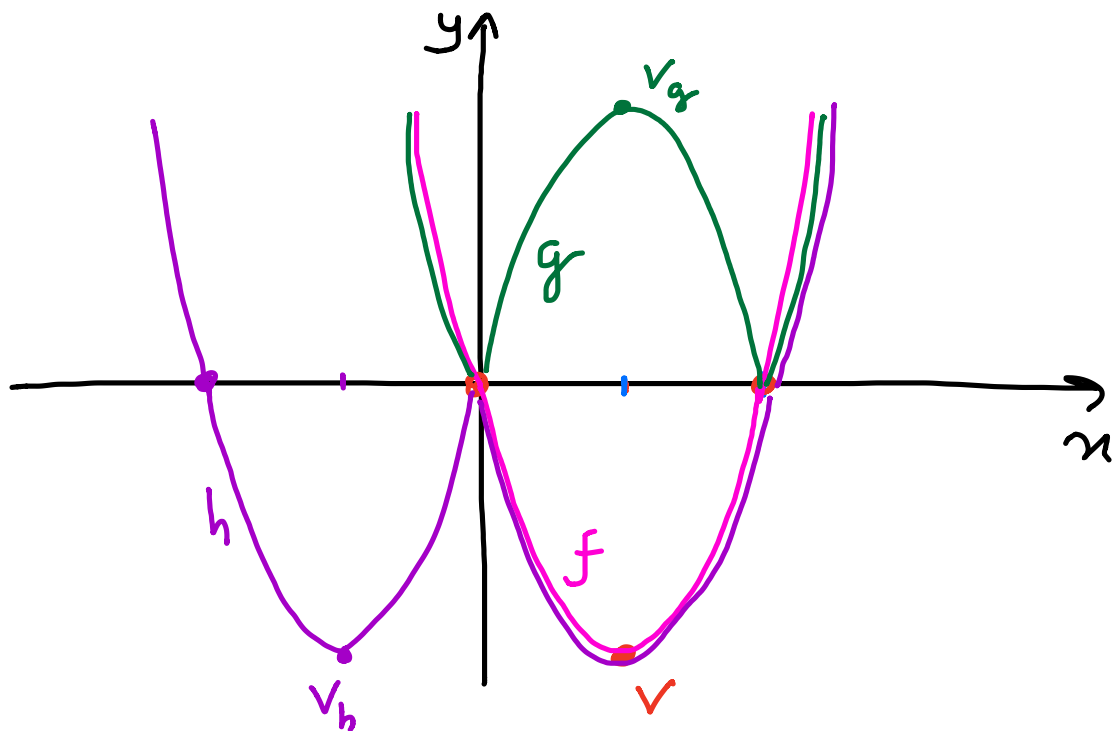
$$y = f(x)$$

$$y = |f(x)| \quad \text{LA PARTE NEGATIVA SI RIBALTA RISP. } \vec{x}$$

$$y = f(|x|) \quad \text{LA PARTE SINISTRA SI OTTIENE CON UNA SIMMETRIA RISPETTO A } \vec{y}$$

2. $f(x) = x^2 - 4x$ $g(x) = |x^2 - 4x|$ $h(x) = x^2 - 4|x|$

PARABOLA DI VERTICE $V(2; -4)$
ED INTERSEZIONI $A(4; 0)$ $O(0; 0)$



PROVACI TU ...

1. $f(x) = x^2 - 3x + 2$ $g(x) = |f(x)|$ $h(x) = f(|x|)$

2. $f(x) = \frac{x-2}{x+1}$ " " " "

3. $f(x) = 2x - 4$ " " " "

PROVACI TU...

RICONOSCERE I GRAFICI DELLE SEGUENTI FUNZIONI

1. $y = \sin|x|$

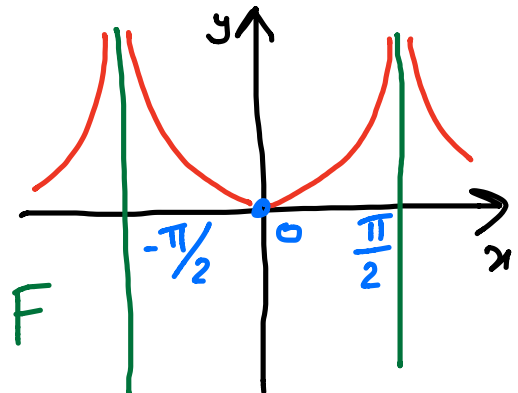
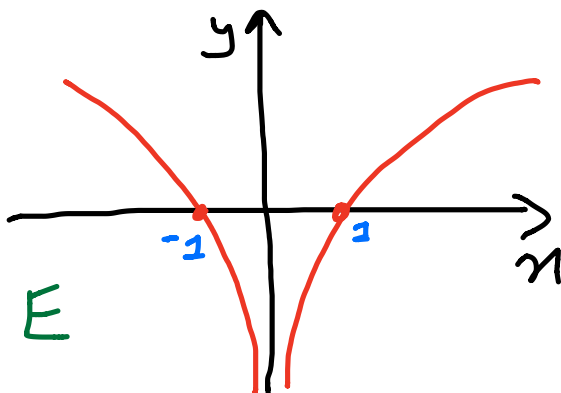
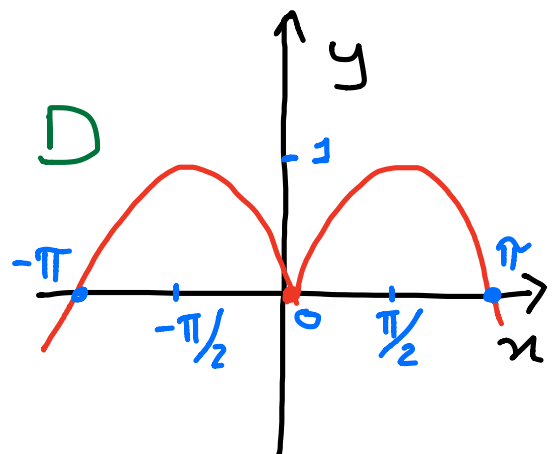
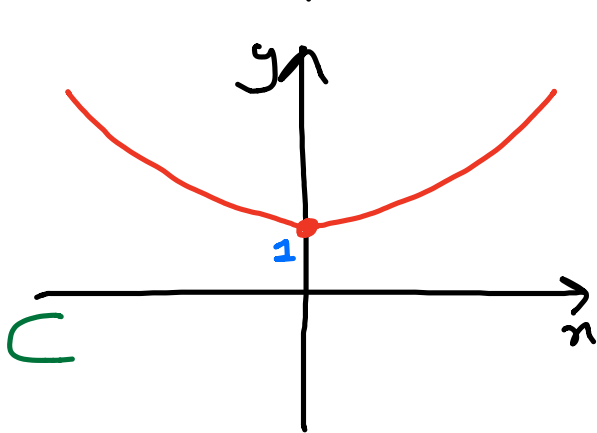
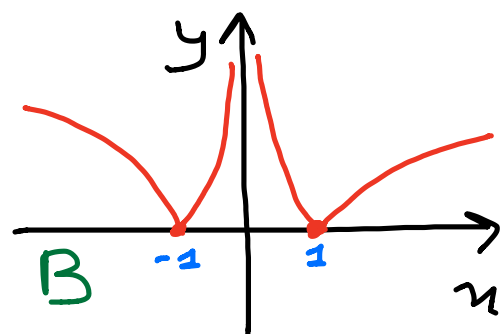
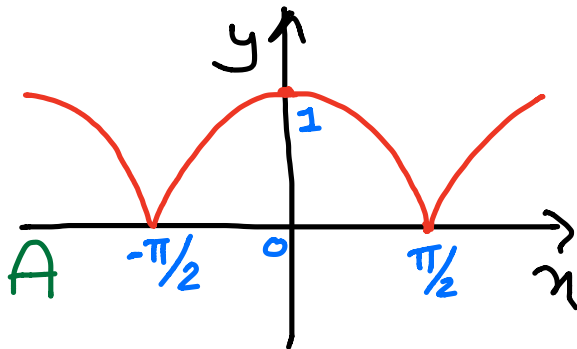
2. $y = |\cos x|$

3. $y = |\tan|x||$

4. $y = \ln|x|$

5. $y = e^{|x|}$

6. $y = |\ln|x||$



ANCORA TRASFORMAZIONI INTERESSANTI

1. $f(x) = \ln(x+2)$ $g(x) = \ln x + 2$

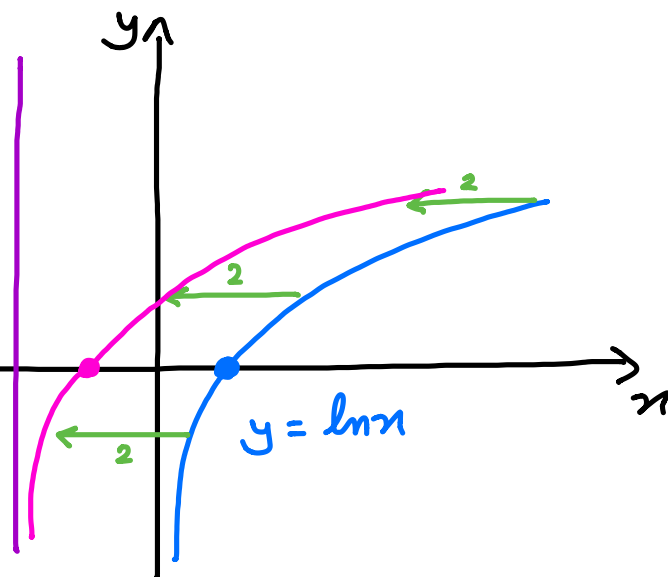
GENERALIZZANDO..

$$y = f(x+a)$$

SI TRASLA LA x

A SINISTRA (+)

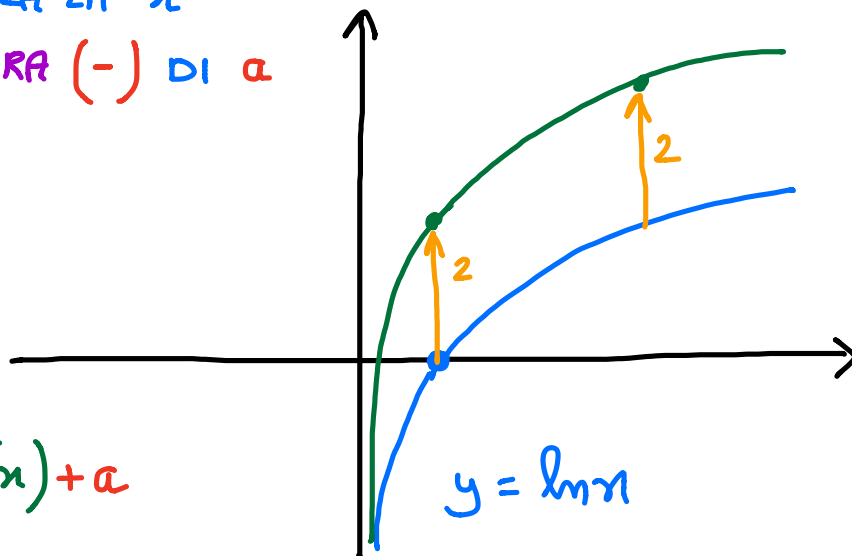
DI a



$$y = f(x \downarrow -a)$$

SI TRASLA LA x

A DESTRA (-) DI a



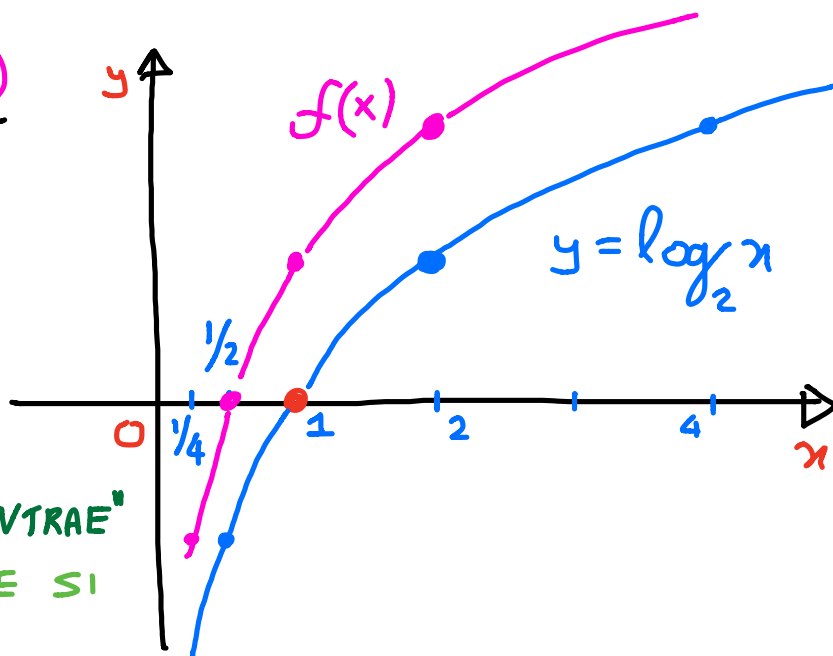
$$y = f(x) + a$$

2. $f(x) = \log_2 2x$

$g(x) = 2 \log_2 x$

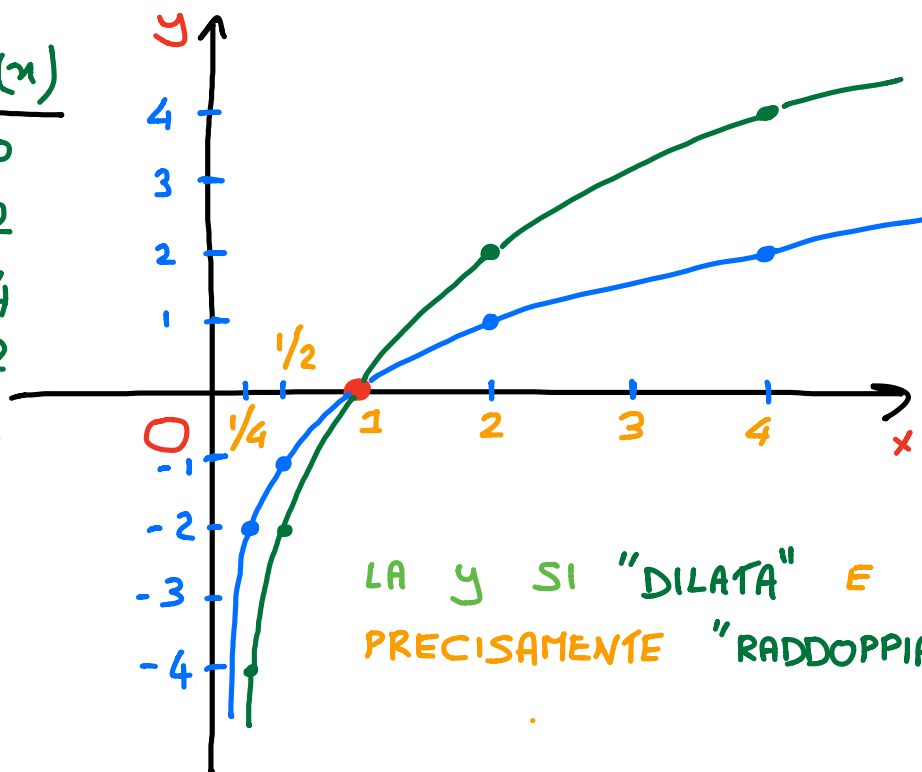
$y = \log_2 x$

x	y	$f(x)$
1	0	1
2	1	2
4	2	
$\frac{1}{2}$	-1	0
$\frac{1}{4}$	-2	-1



LA x SI "CONTRAEE"
E PRECISAMENTE SI
"DIMEZZA"

x	y	$g(x)$
1	0	0
2	1	2
4	2	4
$\frac{1}{2}$	-1	-2
$\frac{1}{4}$	-2	-4



LA y SI "DILATA" E
PRECISAMENTE "RADDOPPIA"

PROVACI TU...

RICONOSCERE I GRAFICI DELLE SEGUENTI FUNZIONI

1. $y = 2 \sin x$

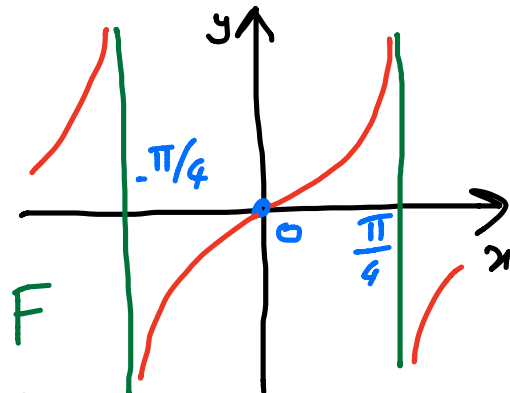
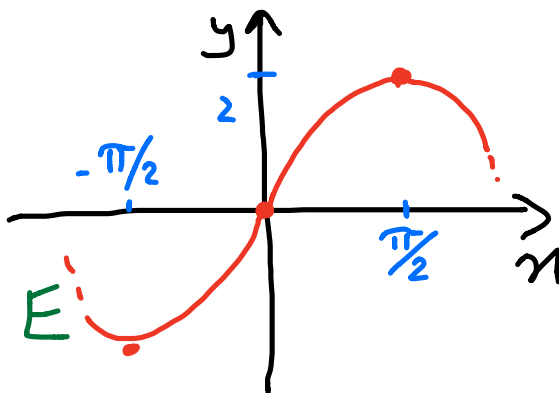
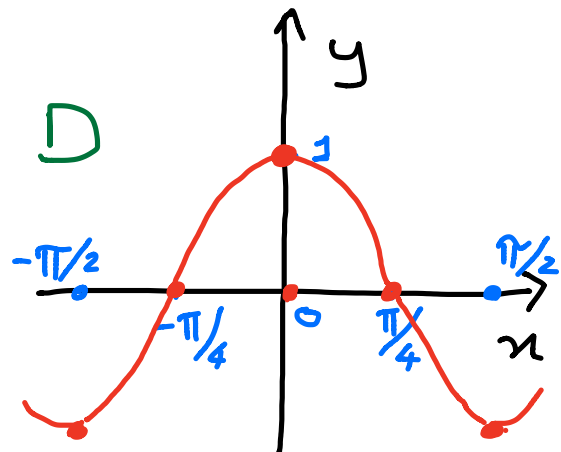
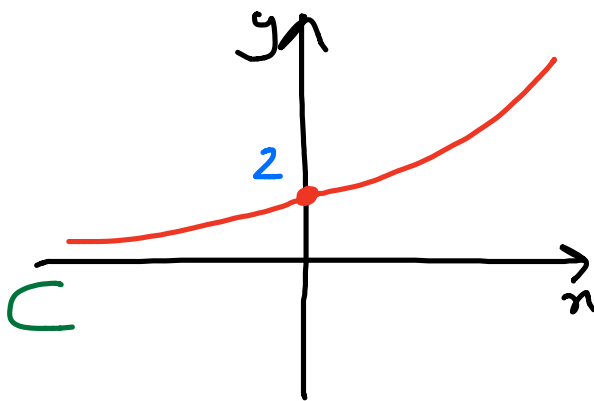
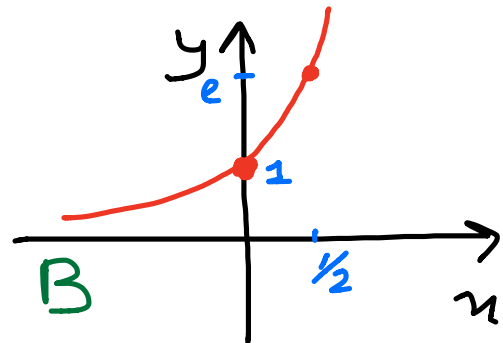
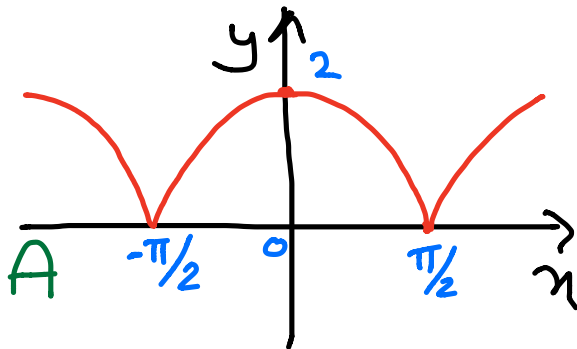
2. $y = \cos 2x$

3. $y = \tan 2x$

4. $y = 2e^x$

5. $y = e^{2x}$

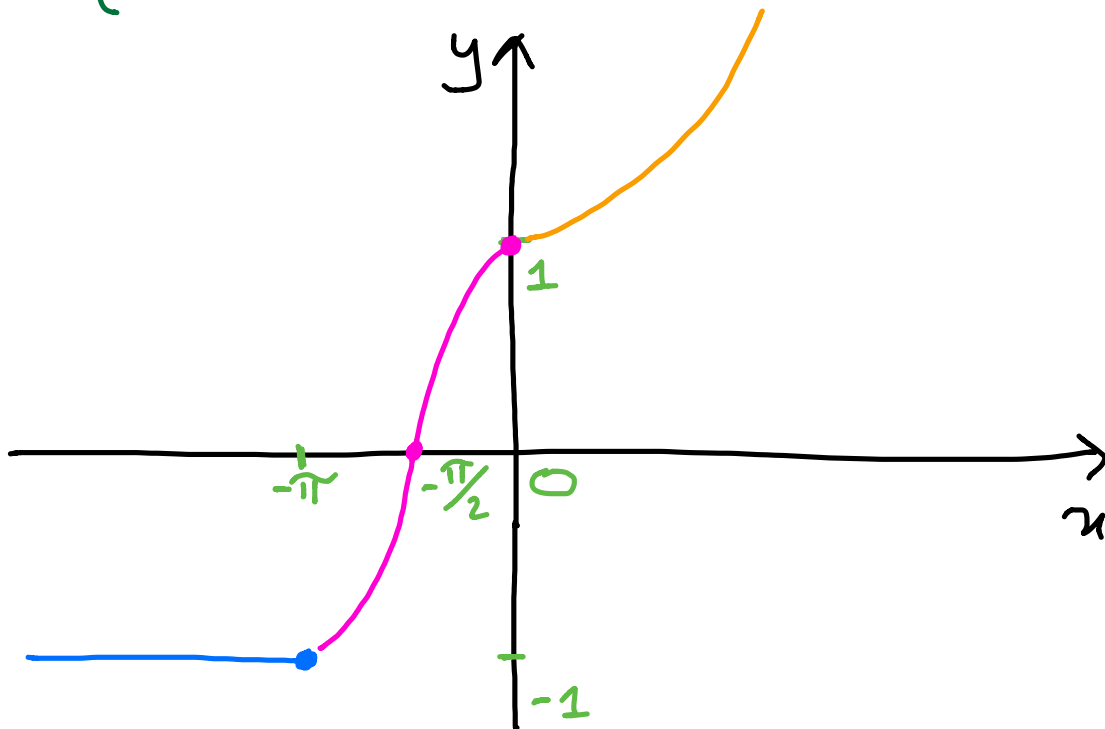
6. $y = |2 \cos x|$



2A FUNZIONE MULTIDEFINITA

ESEMPIO 1

$$f(x) = \begin{cases} -1 & \text{SE } x \leq -\pi \\ \cos x & \text{SE } -\pi < x \leq 0 \\ e^x & \text{SE } x > 0 \end{cases}$$



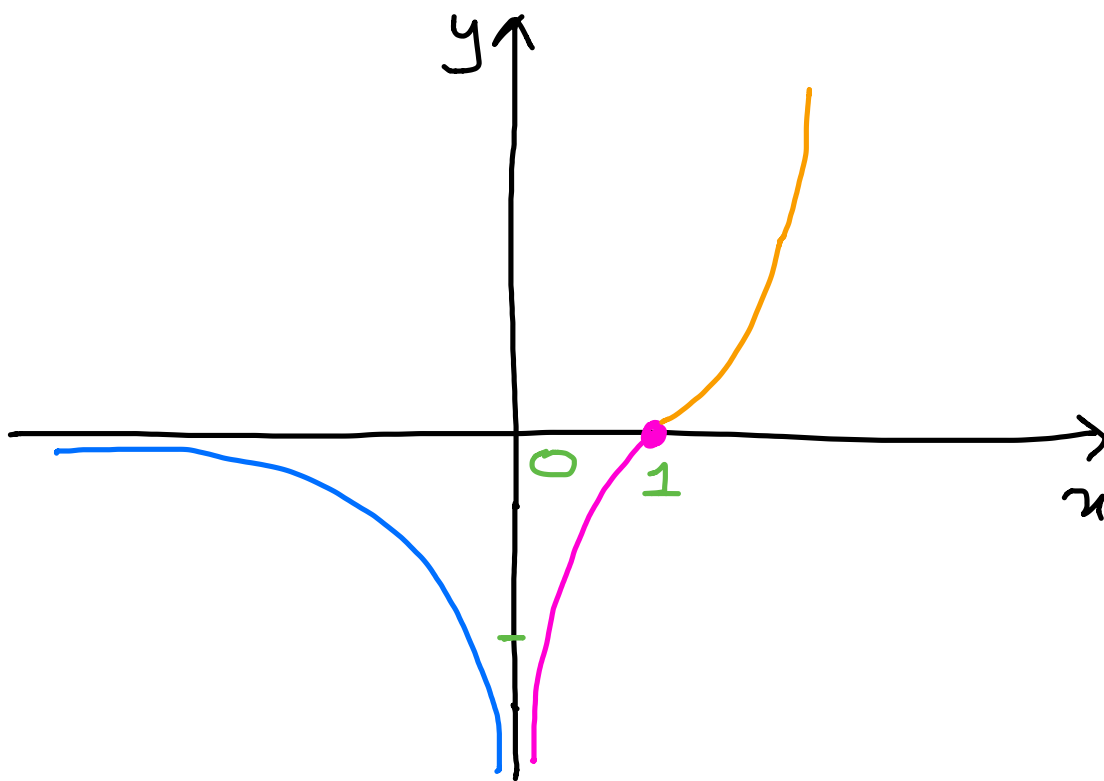
OSSERVAZIONI

- LA FUNZIONE È LIMITATA INFERIORMENTE E ILLIMITATA SUPERIORMENTE
- È MONOTONA NON DECRESCENTE (O CRESCENTE NON STRETTAMENTE)
- NON È INIETTIVA
- cod = $[-1; +\infty)$

2A FUNZIONE MULTIDEFINITA

ESEMPIO 1

$$f(x) = \begin{cases} \frac{1}{x} & \text{SE } x < 0 \\ \ln x & \text{SE } 0 < x \leq 1 \\ x^2 - 1 & \text{SE } x > 1 \end{cases}$$



OSSERVAZIONI

- LA FUNZIONE È ILLIMITATA INFERIORMENTE E ILLIMITATA SUPERIORMENTE
- È MONOTONA DECRESCENTE IN $(-\infty; 0[$
È CRESCENTE IN $]0; +\infty)$
- NON È INIETTIVA
- cod = $]-\infty; +\infty)$