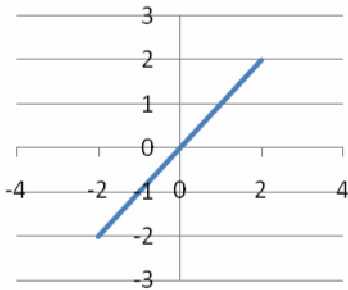


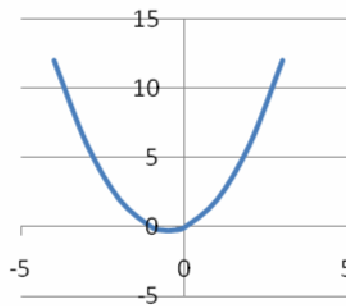
TIPOS DE FUNCIONES

$$F(x) = ax + b$$



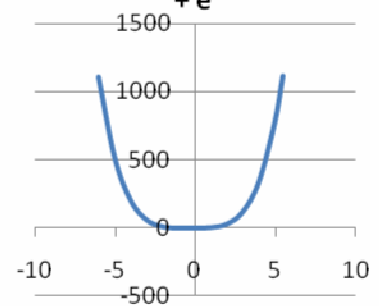
LINEAL (Recta)

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



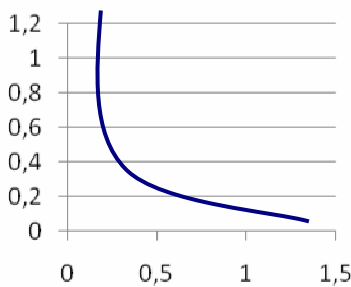
CUADRÁTICA (Parábola)

$$F(x) = ax^4 + bx^3 + cx^2 + dx + e$$



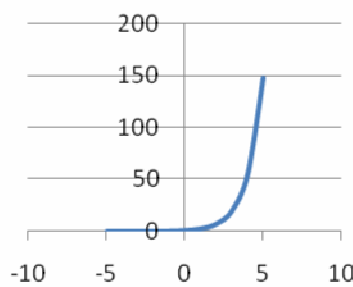
POLINÓMICA

$$F(x) = p(x)/q(x)$$



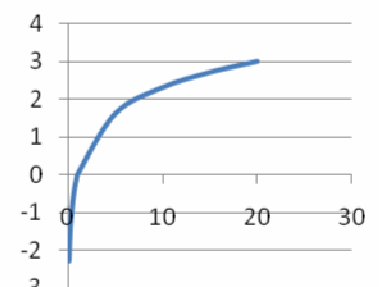
RACIONAL
(prop. inversa, $1/x$, Hipérbola)

$$F(x) = e^x$$



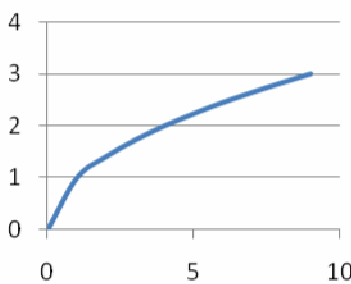
EXPONENCIAL

$$F(x) = \ln x$$



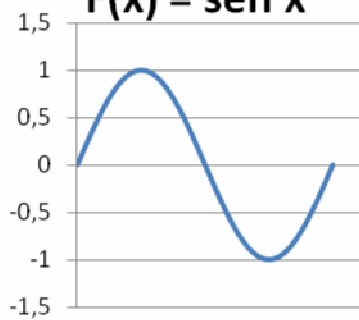
LOGARÍTMICA

$$F(x) = \sqrt{x}$$



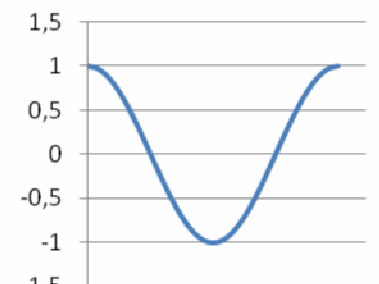
IRRACIONAL

$$F(x) = \text{sen } x$$



SENO (Sinusoide)

$$F(x) = \text{cos } x$$



COSENO (Cosinusoide)

FUNCIONES

Miriam

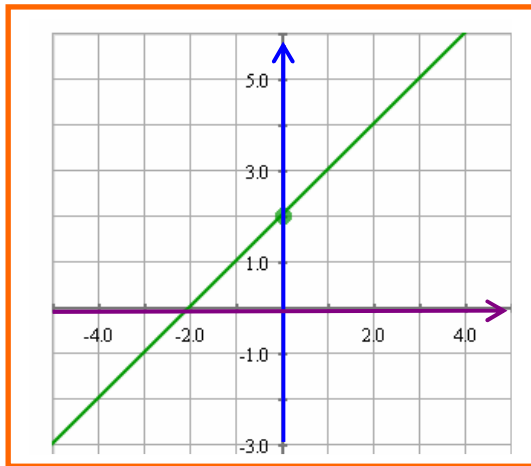
ÍNDICE

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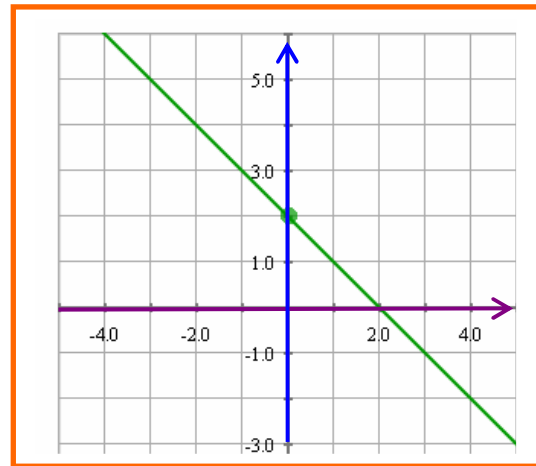


$$y = ax + b$$

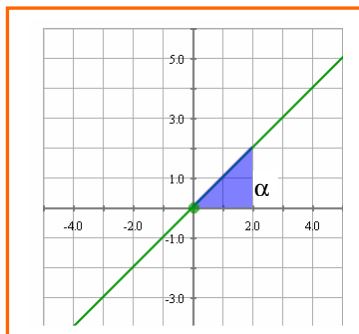
➤ $a =$ pendiente, mide inclinación recta



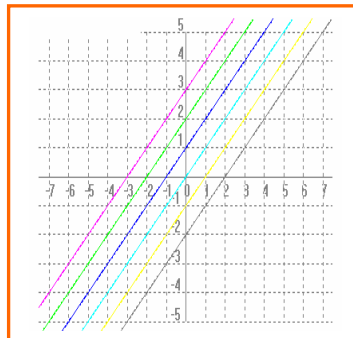
$$a > 0$$



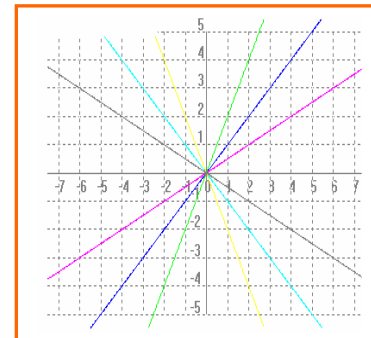
$$a < 0$$



$$a = \operatorname{tg}\alpha$$



$$y = x + b$$



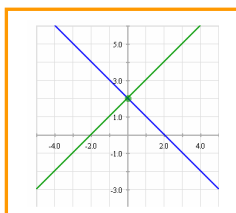
$$y = ax$$

$$D = \mathcal{R}$$

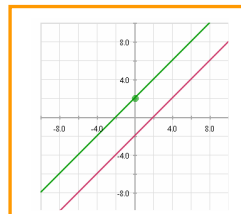
$$R = \mathcal{R}$$

Es continua ~

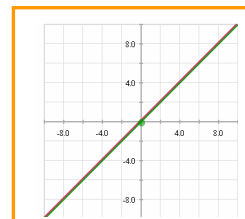
Posición relativa de dos rectas:



SCD



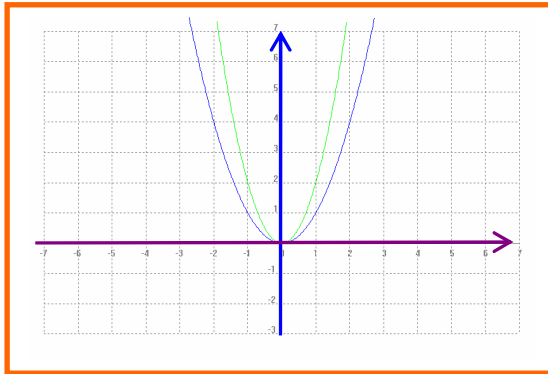
SI



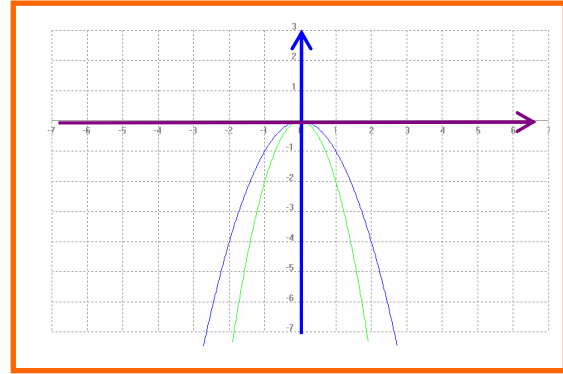
SCI



$$y = ax^2 + bx + c$$



$a > 0 \rightarrow$ cóncava \cup



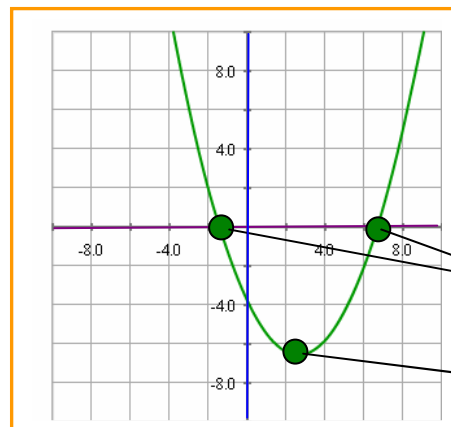
$a < 0 \rightarrow$ convexa \cap

$a =$ abertura parábola

$$D = \mathcal{R}$$

$$R = \mathcal{R}$$

Es continua \sim



Puntos de corte

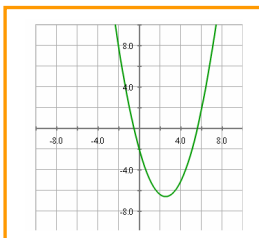
vértice

$$\text{vértice: } x = \frac{-b}{2a}$$

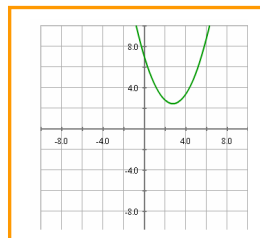
$$\text{Corte OY} = (0, c)$$

$$\text{Corte OX} = ax^2 + bx + c = 0$$

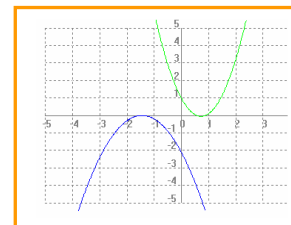
$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$



2 raíces reales



Ninguna raíz real

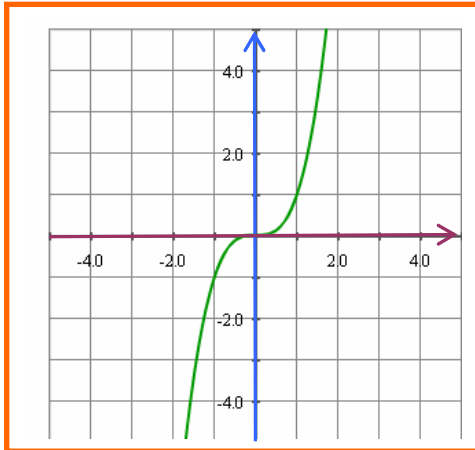


1 raíz doble



$$y = ax^n$$

$$y = x^3$$



$$D = \mathcal{R}$$

$$R = \mathcal{R}$$

Es continua ~

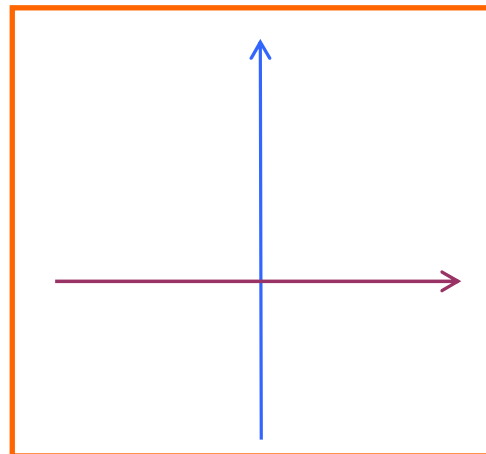
Es creciente ↗

$$y = x^4$$

$$D = \mathcal{R}$$

$$R = \mathcal{R}$$

Es continua ~



PROPIEDADES

$$a^n = a \cdot a \cdot a \cdot \dots \cdot a, n$$

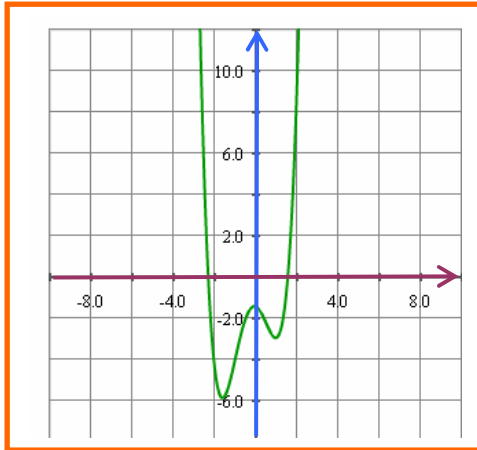
$$a^0 = 1$$

$$a^{-n} = \frac{1}{a^n}$$

$$a^{m/n} = \sqrt[n]{a^m}$$

$$y = a_n x^n + a_{n-1} x^{n-1} + \dots + a_2 x^2 + a_1 x + a_0$$

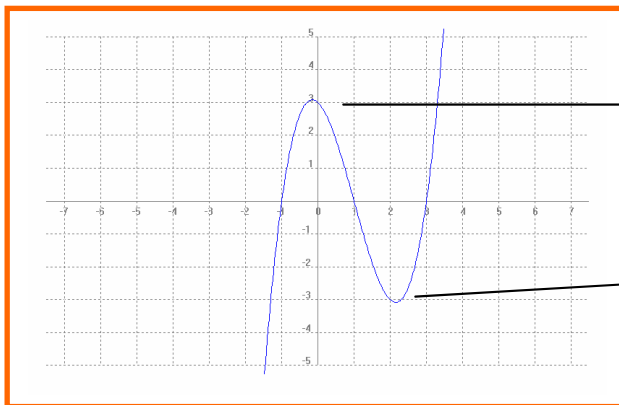
Ej: $y = x^4 + x^3 - 3x^2 - 0.5x - 1.5$



$$D = \mathcal{R}$$

$$R = \mathcal{R}$$

Es continua ~



máximo

mínimo

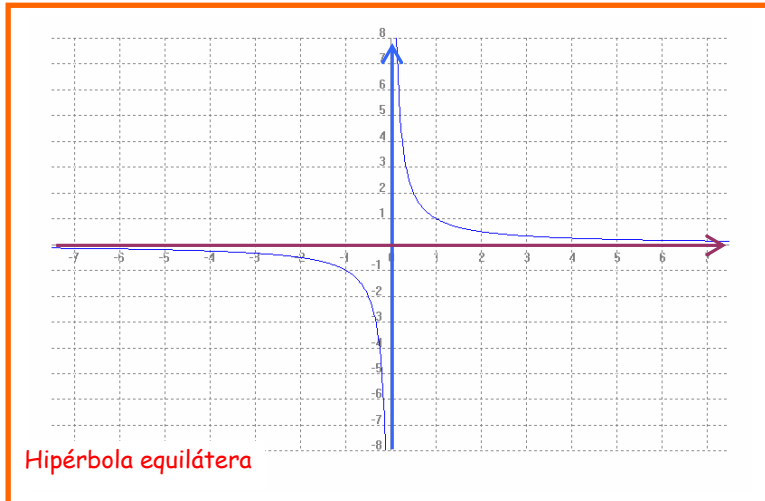
Puede tener:

- $n-1$ máximos-mínimos
- $n-2$ puntos de inflexión



$$y = \frac{k}{x}$$

$$y = \frac{1}{x}$$



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

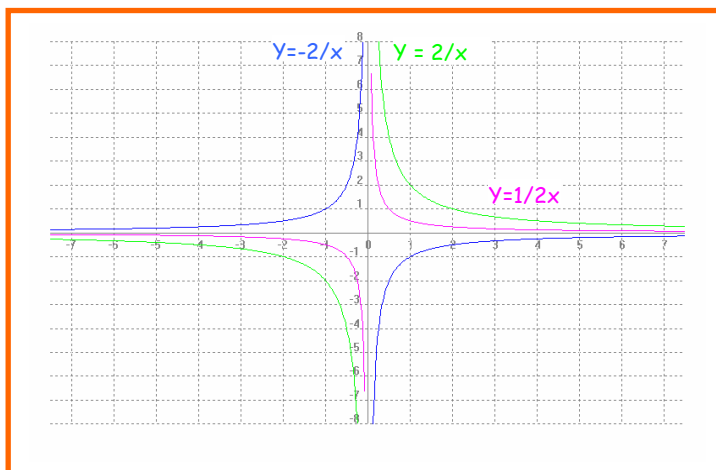
$$R = \mathbb{R} - \{0\}$$

Discontinua

Decreciente \searrow

Asíntotas : $x = 0, y = 0$

x	y
$-\infty$	0
\uparrow	\uparrow
-3	-1/3
-2	-1/2
-1	-1
-1/2	-2
-1/3	-3
1/3	3
1/2	2
1	1
2	1/2
\downarrow	\downarrow
∞	0



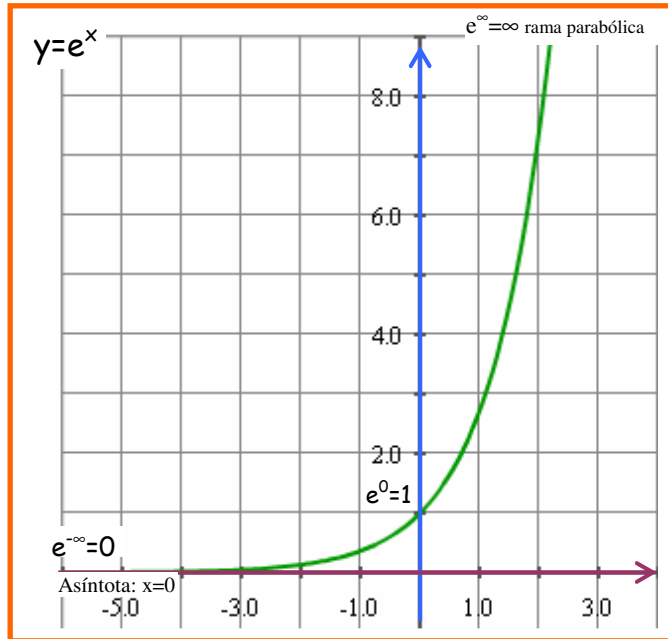
Si $k < 0 \rightarrow$ creciente

Si $k > 0 \rightarrow$ decreciente

$$y = e^x$$

$$y = a^x$$

$$y = ka^{px}$$



x	y
$-\infty$	0
↑	↑
-3	0'0497...
-2	0'01353...
-1	0'3678...
0	1
1	$e=2'71...$
2	7'3890...
3	20'085...
4	54'598...
↓	↓
∞	∞

$$e=2'718281828... ..$$

$$D = \mathcal{R}$$

$$R = \mathcal{R}^+ \quad (e^x > 0)$$

Es continua ~

Es creciente ↗

Es cóncava ∪

PROPIEDADES

$$e^p \cdot e^q = e^{p+q} \quad \text{Transforma producto en suma}$$

$$e^p : e^q = e^{p-q} \quad \text{Transforma cociente en resta}$$

$$(e^p)^q = e^{p \cdot q} \quad \text{Transforma potencia en producto}$$

$$\sqrt[q]{e^p} = e^{p/q} \quad \text{Transforma raíz en cociente}$$

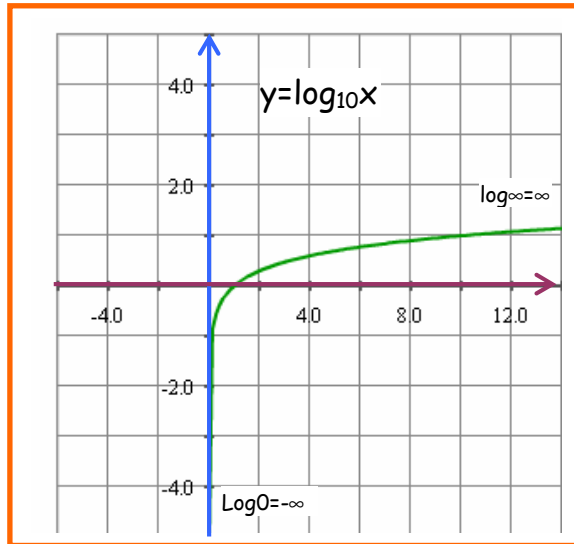


$$y = \log x$$

(decimal)

$$y = \ln x$$

(neperiano)



x	y
0	$-\infty$
0.5	-0'30
1	0
2	0'301...
10	1
100	2
1000	3
∞	∞

$$D = \mathcal{R}^+$$

$$R = \mathcal{R}$$

Es continua ~

Es creciente ↗

Es convexa ∩

PROPIEDADES

$$\log A \cdot B = \log A + \log B$$

$$\log \frac{A}{B} = \log A - \log B$$

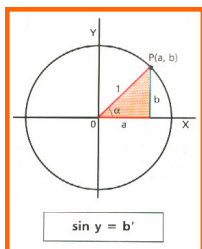
$$\log A^n = n \log A$$

$$\log \sqrt[n]{A} = \frac{1}{n} \log A$$

$$\text{Log } N = x \quad 10^x = N$$

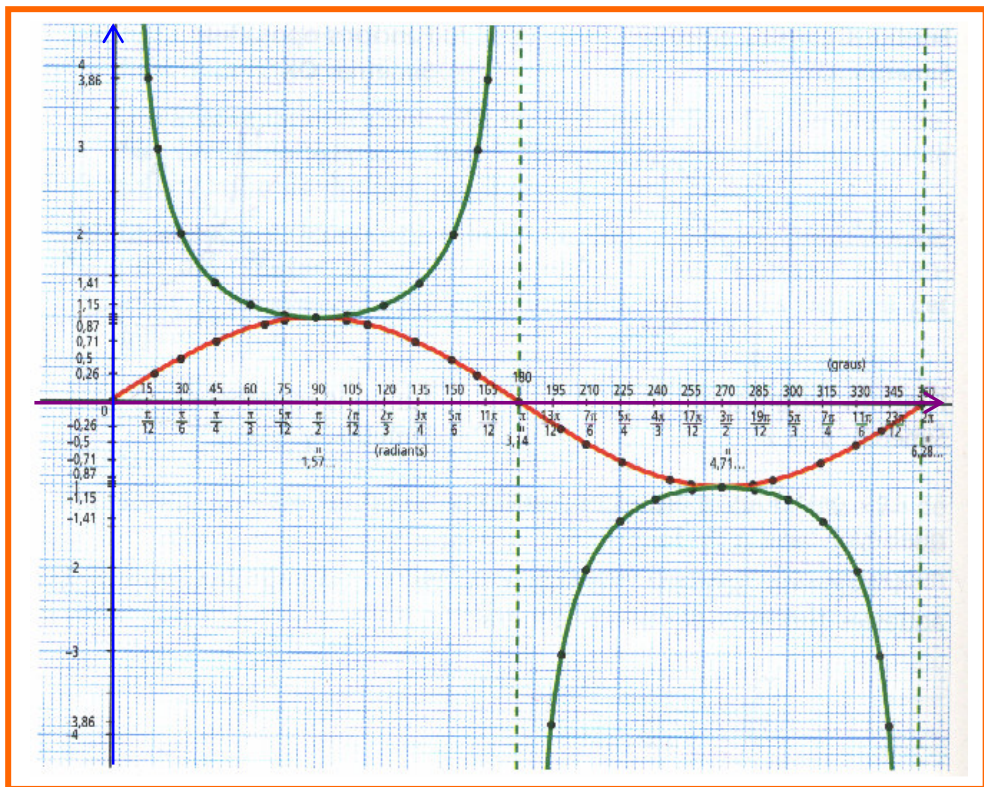
FUNCIÓN SENO Y COSECANTE

Función circular



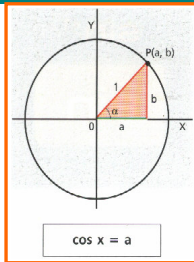
$$y = \text{sen } x$$

$$\text{Cosec } x = \frac{1}{\text{sen } x}$$



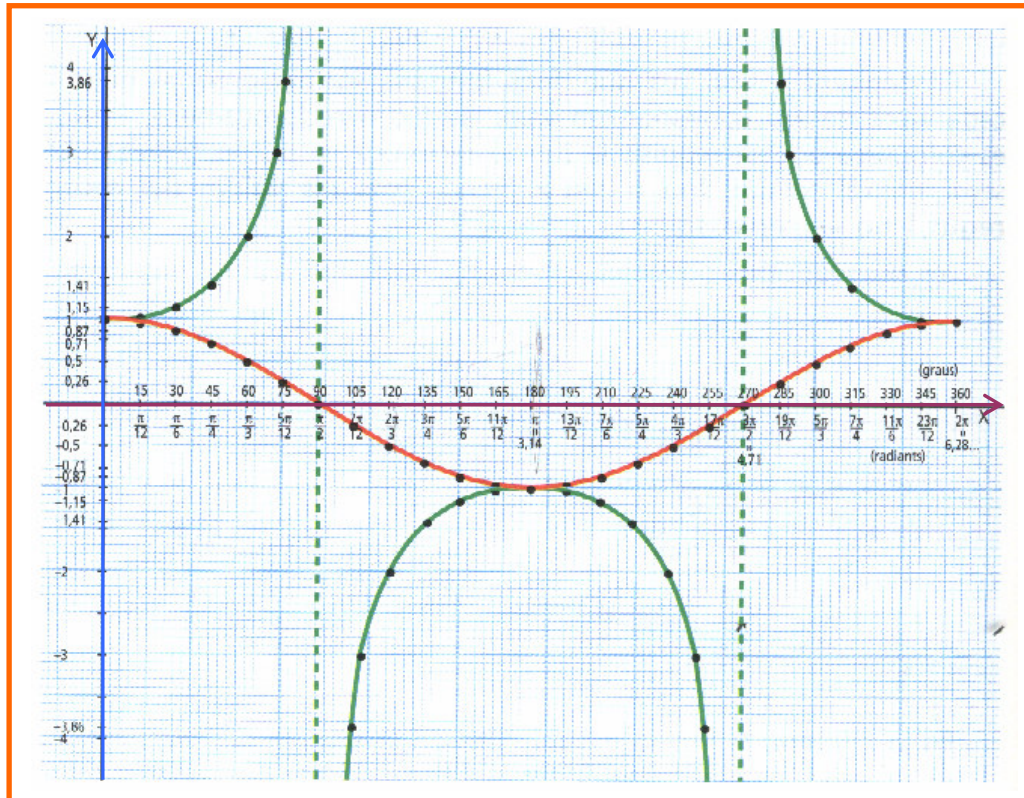
	$f(x) = \sin x$	$f(x) = \text{cosec } x$
Dominio	\mathcal{R}	$\mathcal{R} - \{0 + k\pi, k \in \mathcal{R}\}$
Recorrido	$[-1, 1]$	$[1, +\infty) \cup [-1, -\infty)$
Período	$2\pi: \text{sen}(x + 2\pi) = \text{sen } x$	$2\pi: \text{cosec}(x + 2\pi) = \text{cosec } x$
Continuidad	En su dominio	En su dominio
Simetría	Impar: $\text{sen}(-x) = -\text{sen } x$	Impar: $\text{cosec}(-x) = -\text{cosec } x$
Creciente ↗	$\left(0, \frac{\pi}{2}\right) \cup \left(\frac{3\pi}{2}, 2\pi\right)$	$\left(\frac{\pi}{2}, \frac{3\pi}{2}\right)$
Decreciente ↘	$\left(\frac{\pi}{2}, \frac{3\pi}{2}\right)$	$\left(0, \frac{\pi}{2}\right) \cup \left(\frac{3\pi}{2}, 2\pi\right)$

Función circular



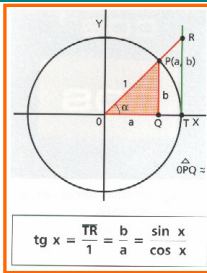
$$y = \cos x$$

$$Y = \sec x = \frac{1}{\cos x}$$



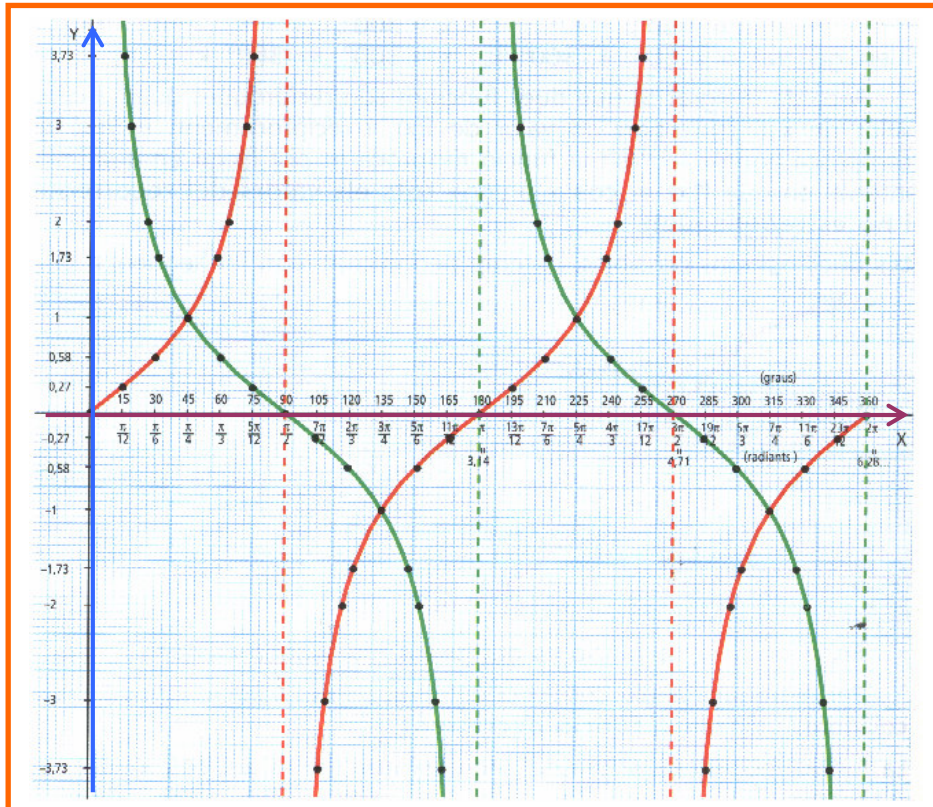
	$f(x) = \cos x$	$f(x) = \sec x$
Domínio	\mathcal{R}	$\mathcal{R} - \{ \pi/2 + k\pi, k \text{ entero} \}$
Recorrido	$[-1, 1]$	$[1, +\infty) \cup [-1, -\infty)$
Período	$2\pi: \cos(x + 2\pi) = \cos x$	$2\pi: \sec(x + 2\pi) = \sec x$
Continuidad	En su dominio	En su dominio
Simetría	par: $\cos(-x) = \cos x$	par: $\sec(-x) = \sec x$
Creciente ↗	$(\pi, 2\pi)$	$(0, \frac{\pi}{2}) \cup (\frac{\pi}{2}, \pi)$
Decreciente ↘	$(0, \pi)$	$(\pi, \frac{3\pi}{2}) \cup (\frac{3\pi}{2}, 2\pi)$

Función circular



$$y = \text{tg } x$$

$$\text{Cotg } x = \frac{1}{\text{tg } x}$$



	$f(x) = \text{tg } x$	$f(x) = \text{cotg } x$
Dominio	$\mathcal{R} - \{ \pi/2 + k\pi, k \in \mathcal{R} \}$	$\mathcal{R} - \{ k\pi, k \in \mathcal{R} \}$
Recorrido	\mathcal{R}	\mathcal{R}
Período	$\pi: \text{tg}(x + \pi) = \text{tg } x$	$2\pi: \text{cotg}(x + \pi) = \text{cotg } x$
Continuidad	En su dominio	En su dominio
Simetría	Impar: $\text{tg}(-x) = -\text{tg } x$	Impar: $\text{cotg}(-x) = -\text{cotg } x$
Creciente ↗	En su dominio	En ningún punto
Decreciente ↘	En ningún punto	En su dominio