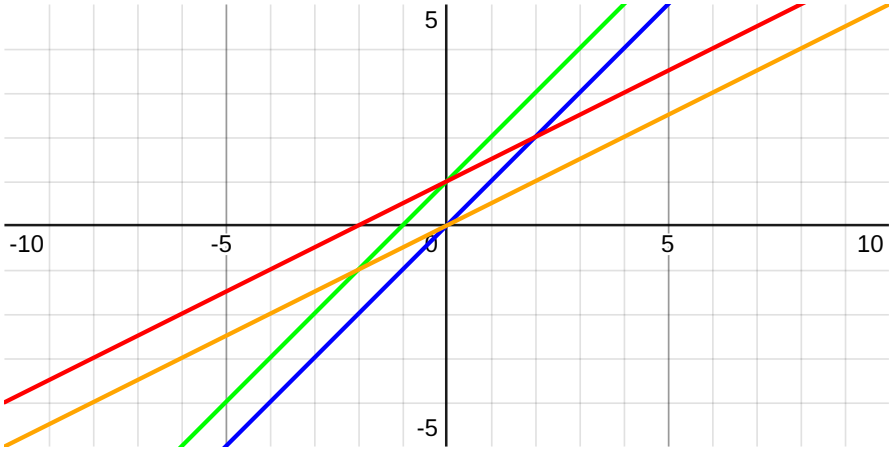
Funzioni elementari

Rette

$f(x) = mx + q$

- m: coefficiente angolare, si può calcolare con $\frac{\Delta y}{\Delta x}$
- q: intercetta con l'asse y

$f_1(x) = x$ (blu)
$f_2(x) = x + 1$ (verde)
$f_3(x) = \frac{1}{2}x$ (arancione)
$f_4(x) = \frac{1}{2}x + 1$ (rosso)

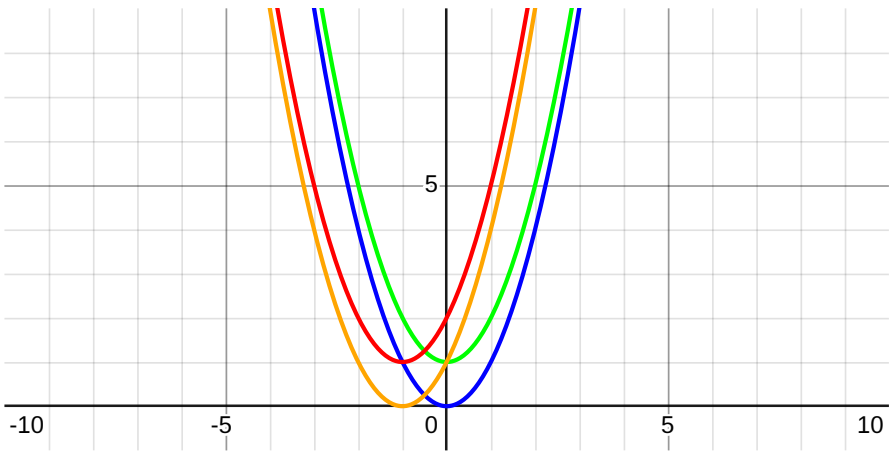


Parabole

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

- a: concavità
- b, c: modificano la posizione, è necessario raccogliere e osservare quali trasformazioni sono applicate
- Il vertice si trova nell'unico punto stazionario

$f_1(x) = x^2$ (blu)
$f_2(x) = x^2 + 1$ (verde)
$f_3(x) = (x + 1)^2 = x^2 + 2x + 1$ (arancione)
$f_4(x) = (x + 1)^2 + 1 = x^2 + 2x + 2$ (rosso)



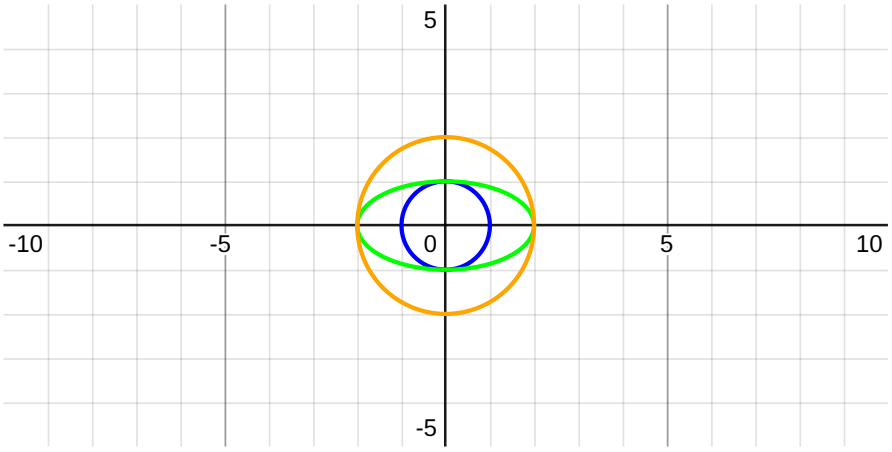
Ellissi

(Non sono funzioni ma unione di due)

$$\left(\frac{x}{a}\right)^2 + \left(\frac{y}{b}\right)^2 = 1$$

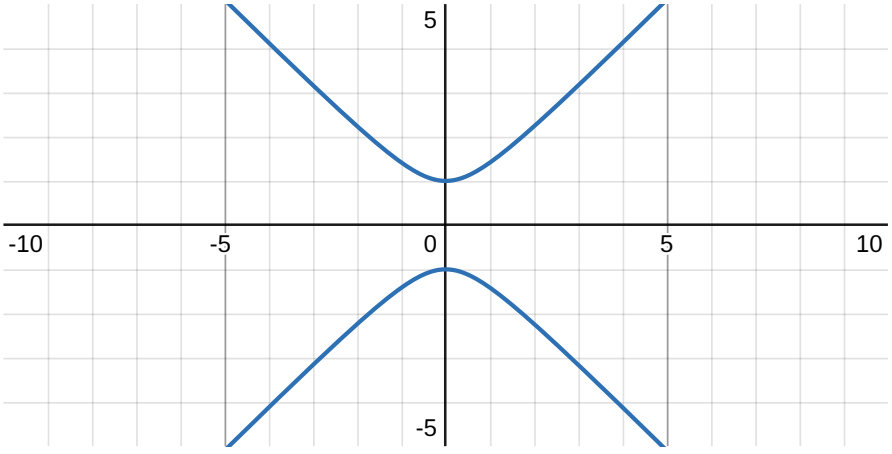
- a: distanza massima dal centro lungo l'asse x
- b: distanza massima dal centro lungo l'asse y
- Il centro si può spostare tramite trasformazioni

$x^2 + y^2 = 1$ (blu)
$\frac{x^2}{4} + y^2 = 1$ (verde)
$\frac{x^2}{4} + \frac{y^2}{4} = 1$ (arancione) ($x^2 + y^2 = 2^2$)

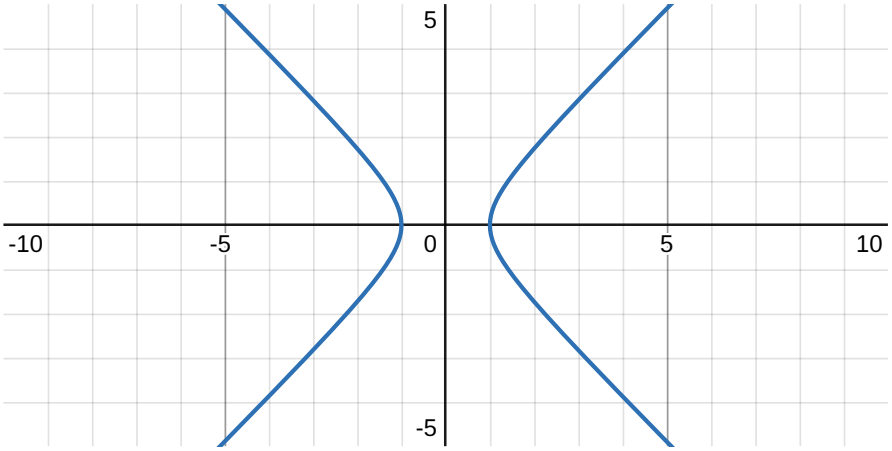


Iperboli

(Non sono funzioni ma composizioni di due)
$y^2 - x^2 = 1$

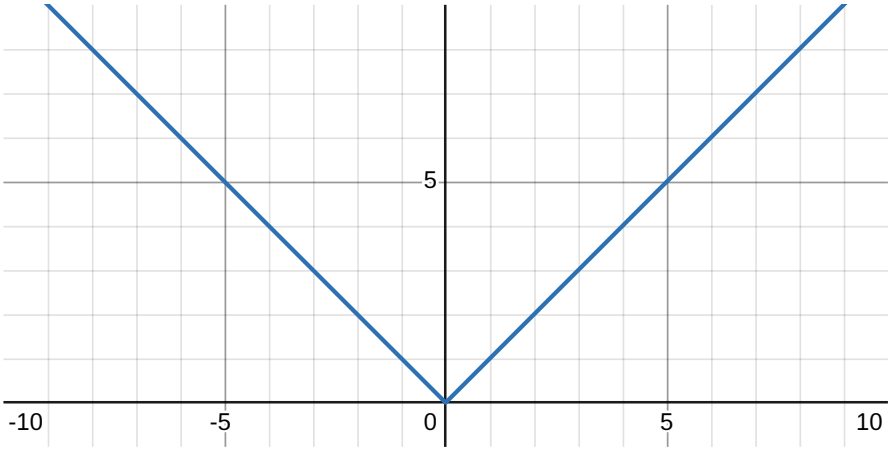


$x^2 - y^2 = 1$



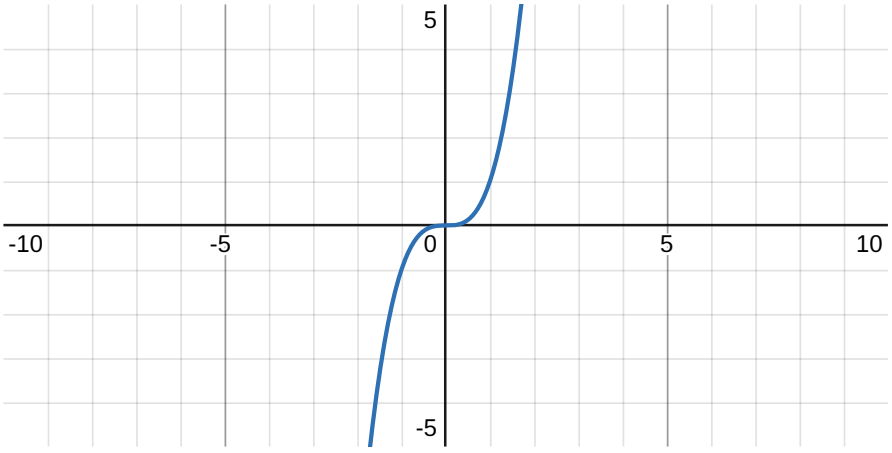
Modulo

$f(x) = |x|$



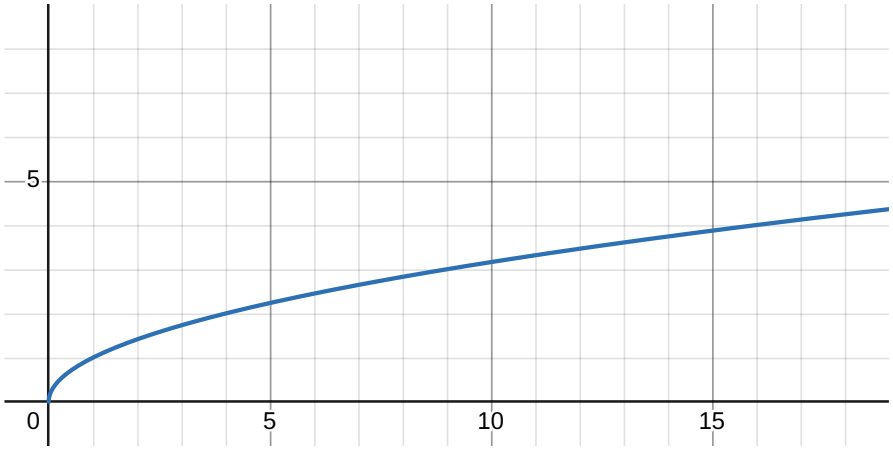
Cubica

$f(x) = x^3$



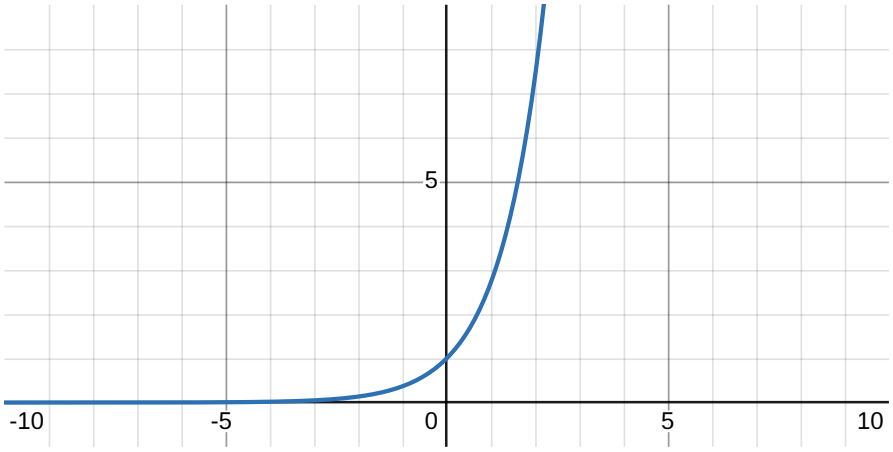
Radice

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



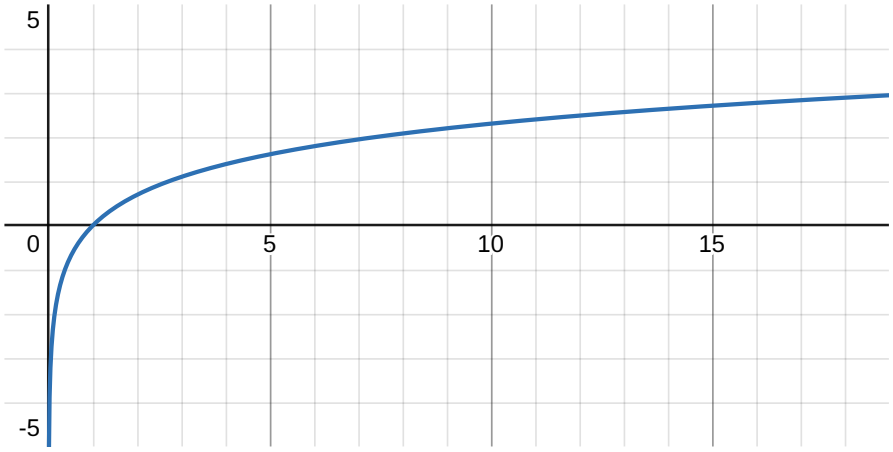
Esponenziale

$f(x) = e^x$



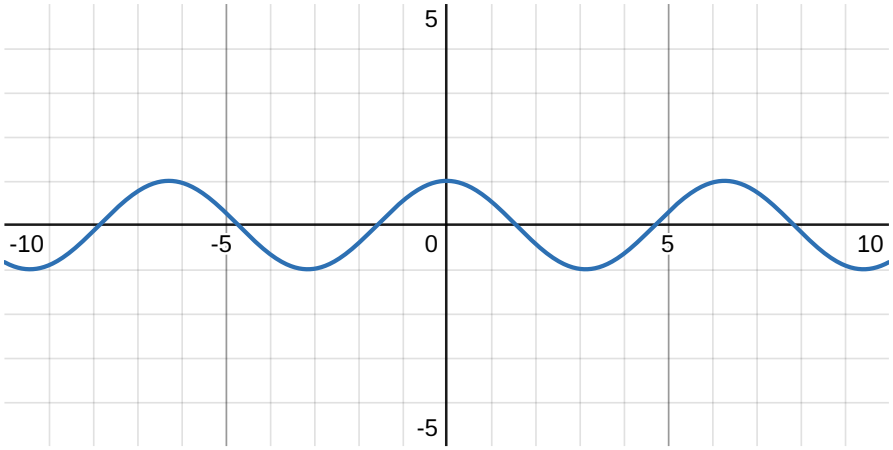
Logaritmo

$f(x) = \ln(x)$

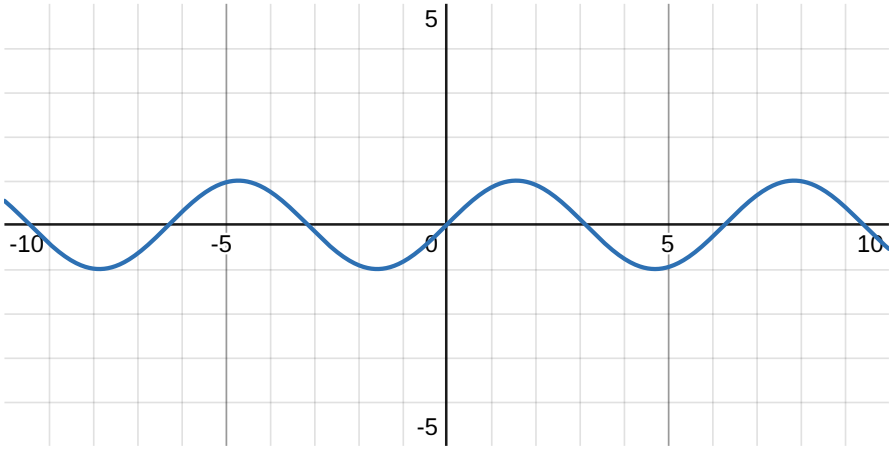


Funzioni trigonometriche

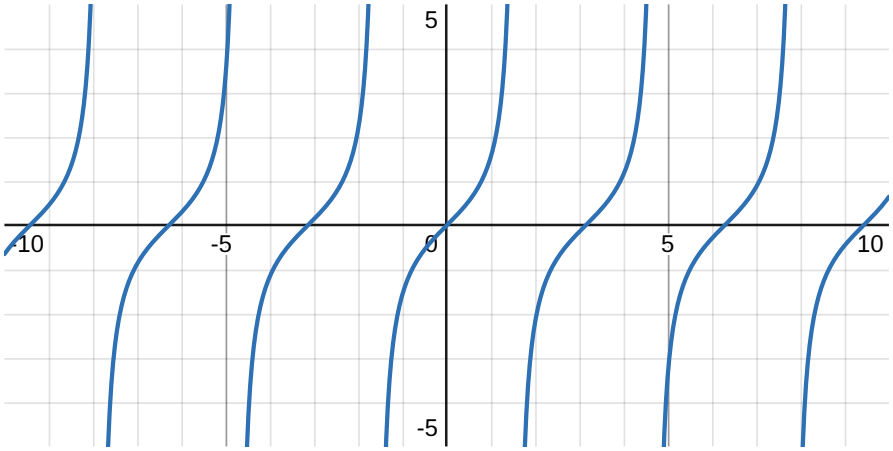
$f(x) = \cos(x)$



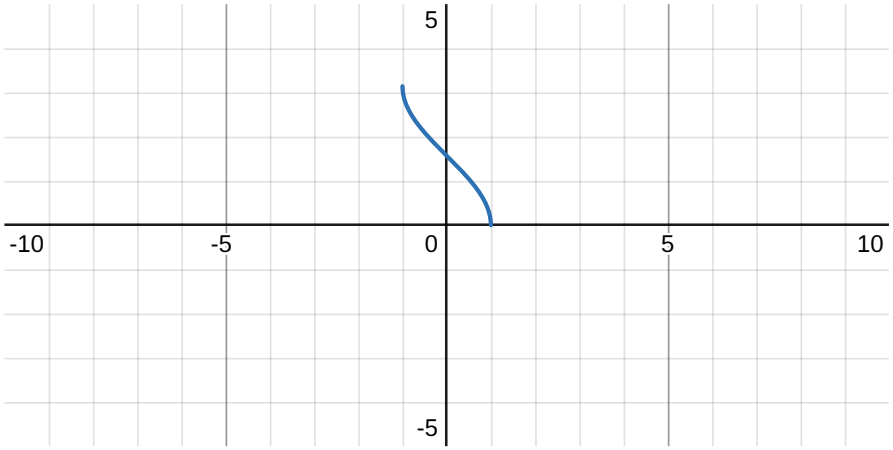
$f(x) = \sin(x)$



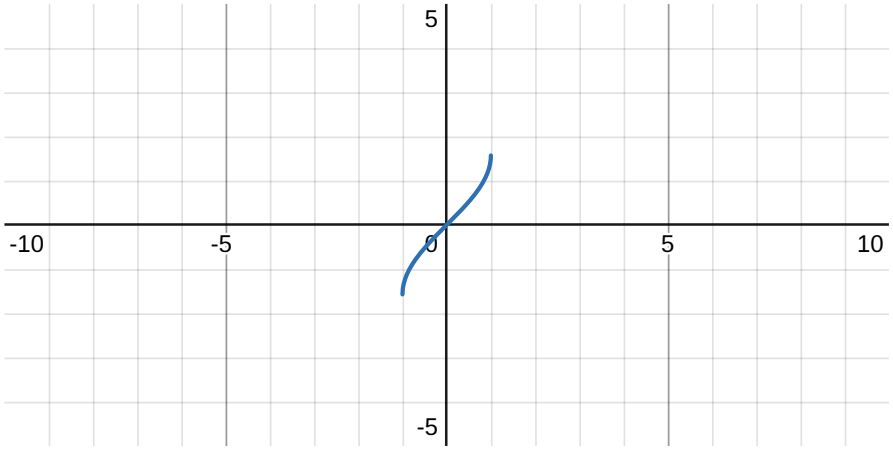
$f(x) = \tan(x) = \frac{\sin(x)}{\cos(x)}$



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



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



$f(x) = \arctan(x)$