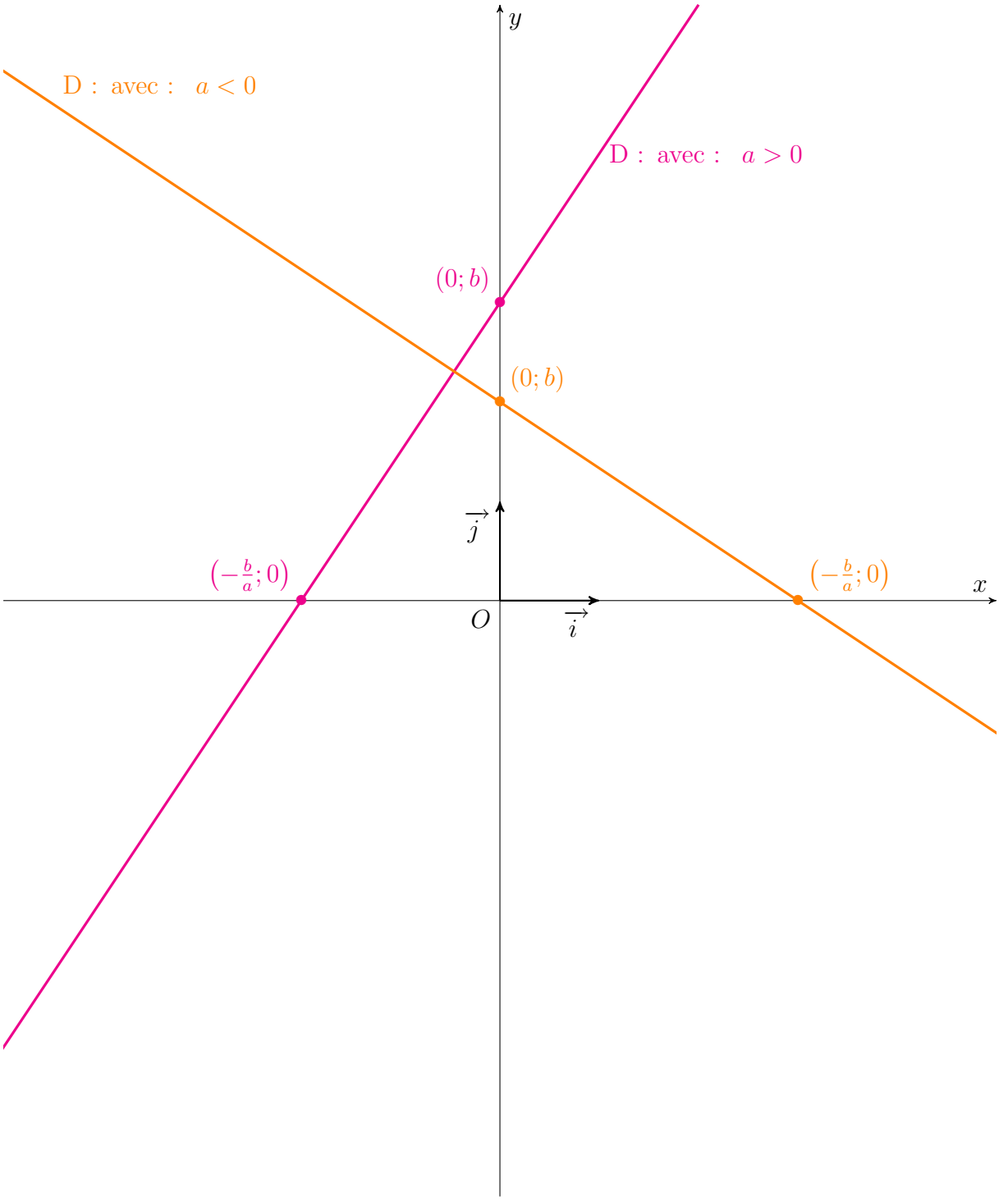
Photographies des fonctions usuelles

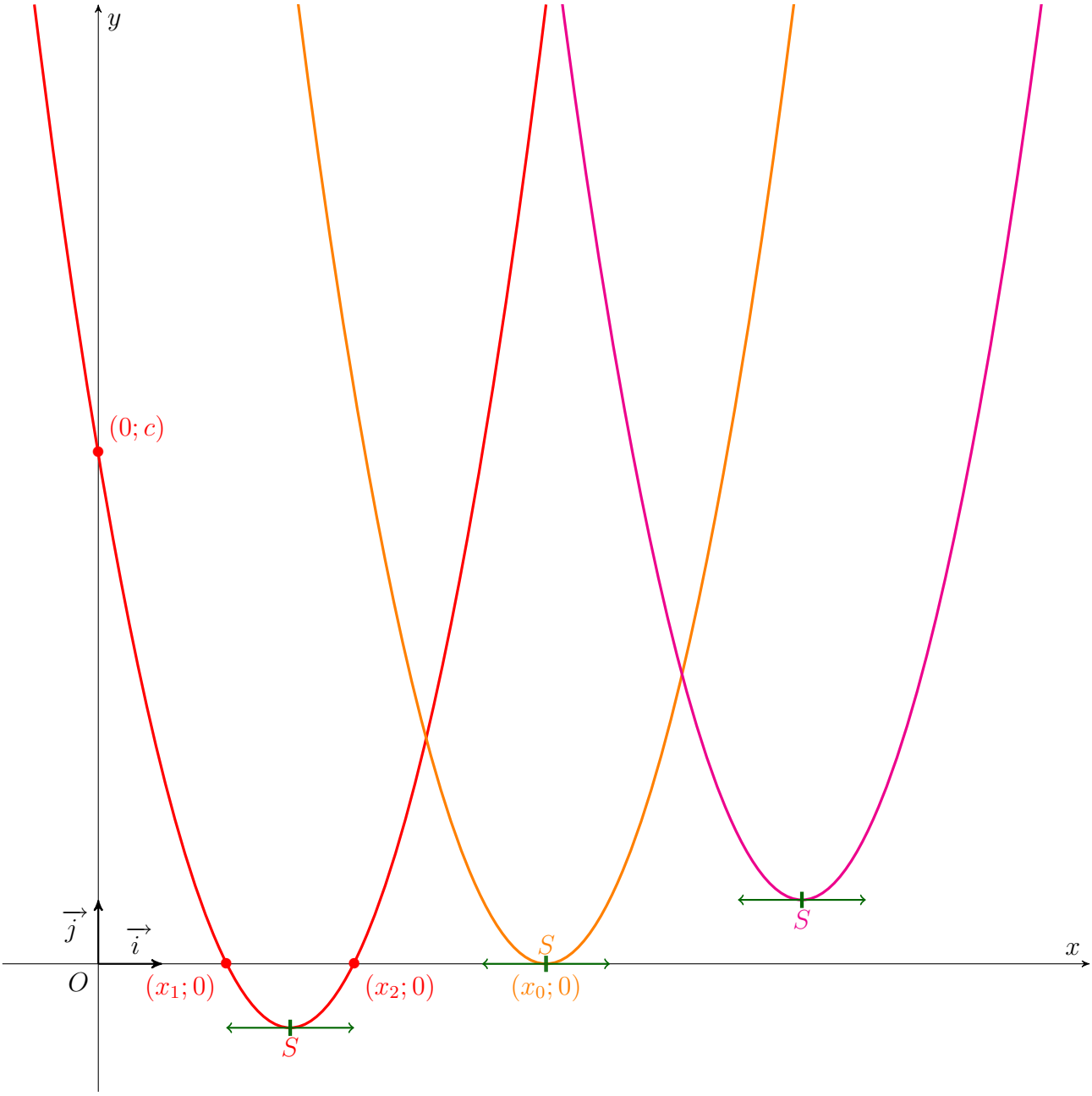
Polynôme du premier degré : Droite

$$D : \quad x \longmapsto y = a\,x + b$$



Polynôme du second degré : Parabole

$x \longmapsto y = f(x) = a\,x^2 + b\,x + c$ avec $a > 0$ $S : \left(-\frac{b}{2a} ; f\left(-\frac{b}{2a}\right)\right)$



$\Delta > 0$	$\Delta = 0$	$\Delta < 0$
$\begin{cases} x_1 = \dfrac{-b - \sqrt{\Delta}}{2a} \\ x_2 = \dfrac{-b + \sqrt{\Delta}}{2a} \end{cases}$	$x_0 = \dfrac{-b}{2a}$	pas de solution

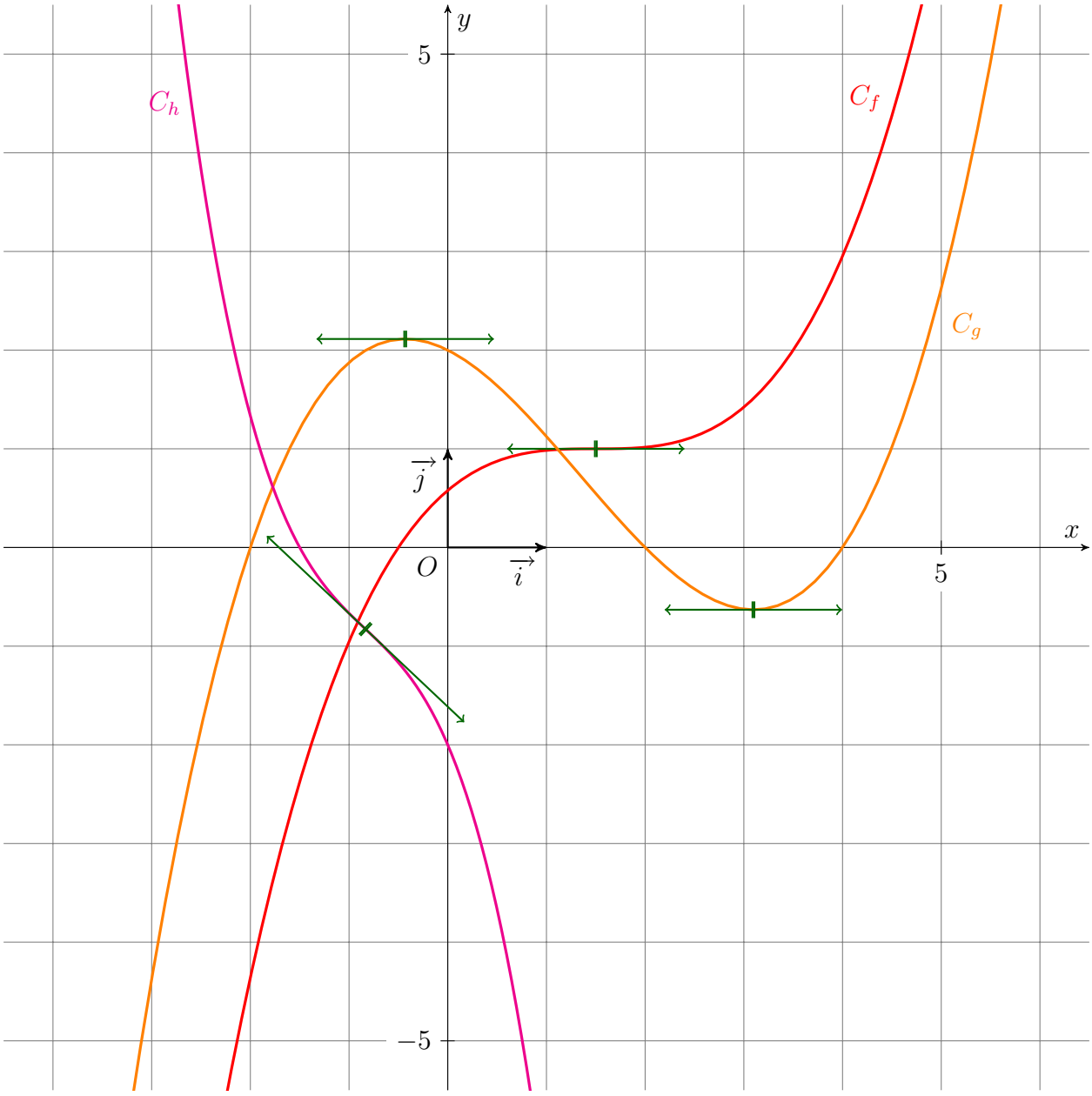
Si $a < 0$ les paraboles ont leurs branches infinies tournées vers le bas.

Polynôme du troisième degré : Cubique

Quelques exemples :

$$C_f : \quad x \longmapsto y = f(x) = \frac{(2x-3)^3}{64} + 1 \qquad C_g : \quad x \longmapsto y = g(x) = \frac{(x-4)(x-2)(x+2)}{8}$$

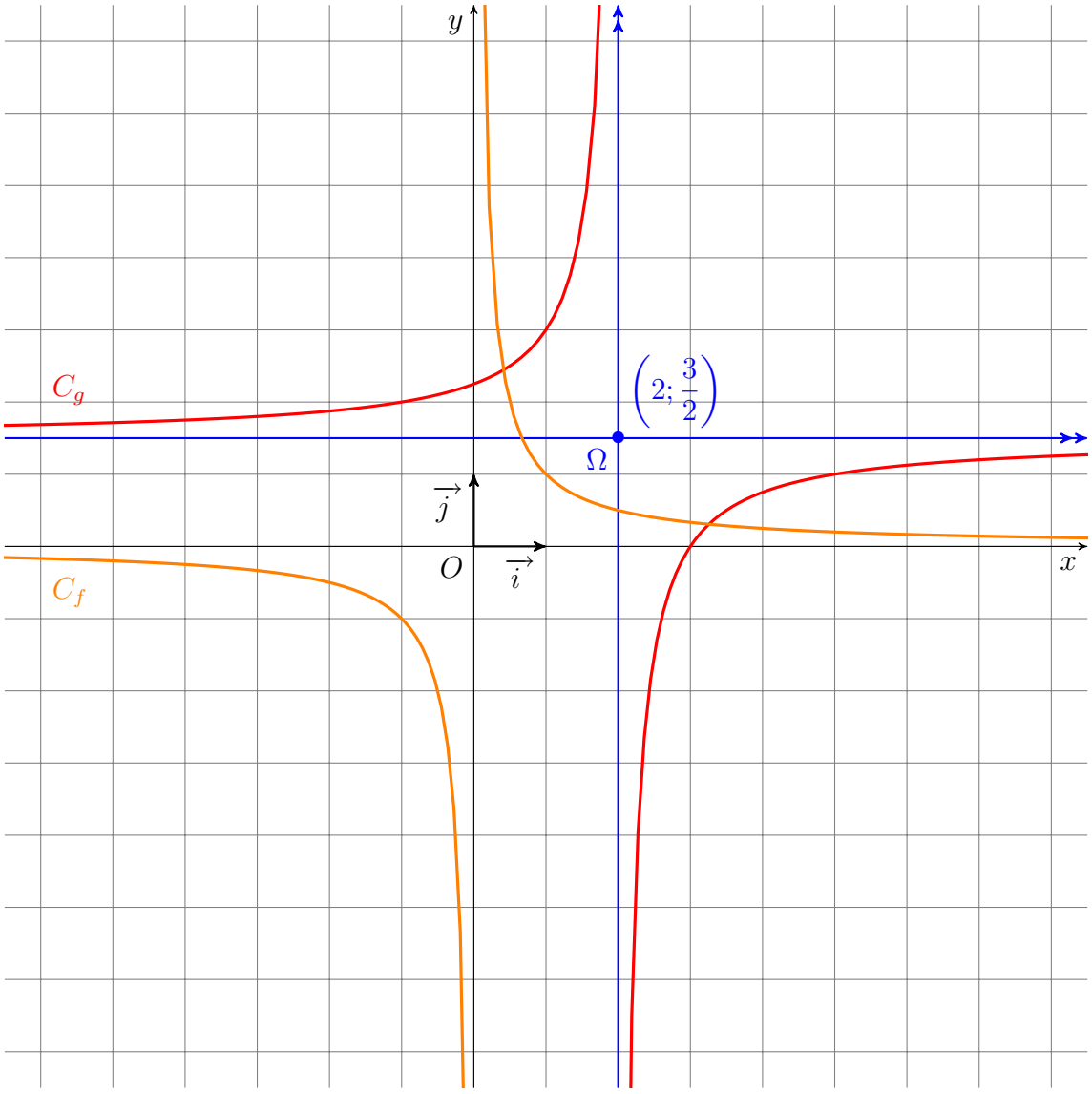
$$C_h : \quad x \longmapsto y = h(x) = \frac{-(2x+3)(x^2+x+2)}{3}$$



Fraction rationnelle du premier degré : Hyperbole

Deux exemples :

C_f : $x \longmapsto y = f(x) = \dfrac{1}{x}$ $x \neq 0$ $\qquad$ C_g : $x \longmapsto y = g(x) = \dfrac{3x-9}{2x-4}$ $x \neq 2$

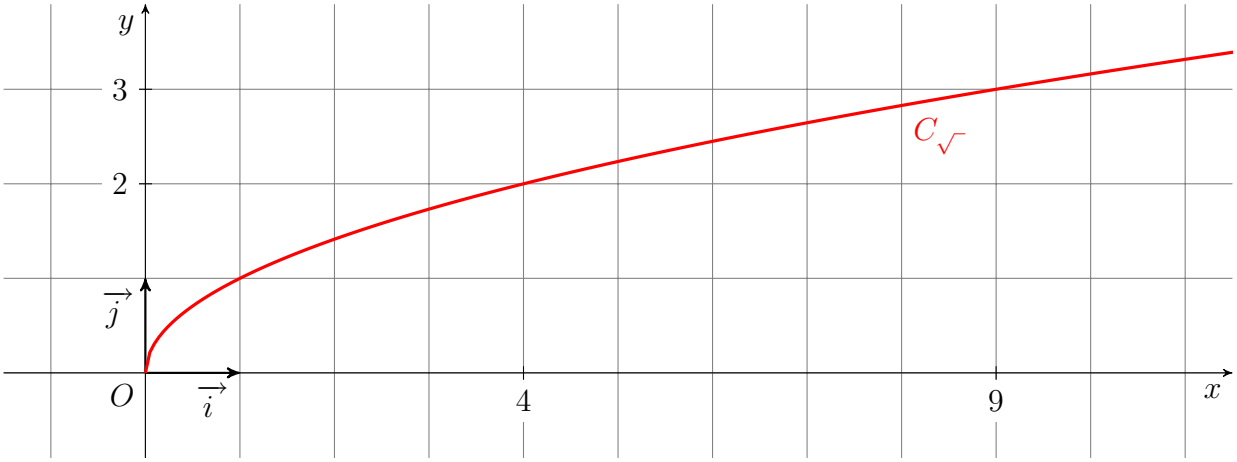


Pour C_f : Asymptotes horizontale $y = 0$ et Asymptotes verticale $x = 0$

Pour C_g : Asymptotes horizontale $y = \dfrac{3}{2}$ et Asymptotes verticale $x = 2$

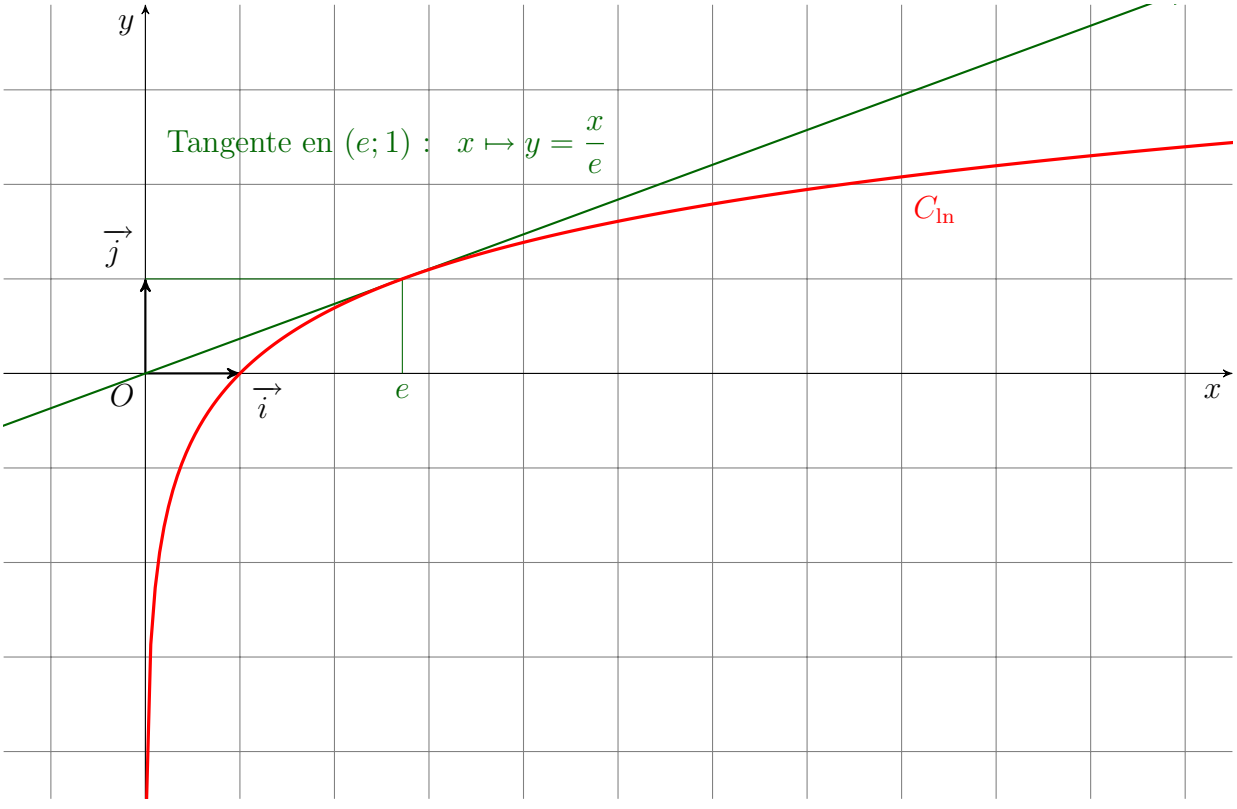
Fonction racine carrée

$$C_{\sqrt{\ }} : \quad x \longmapsto y = \sqrt{x}$$



Fonction logarithme népérien

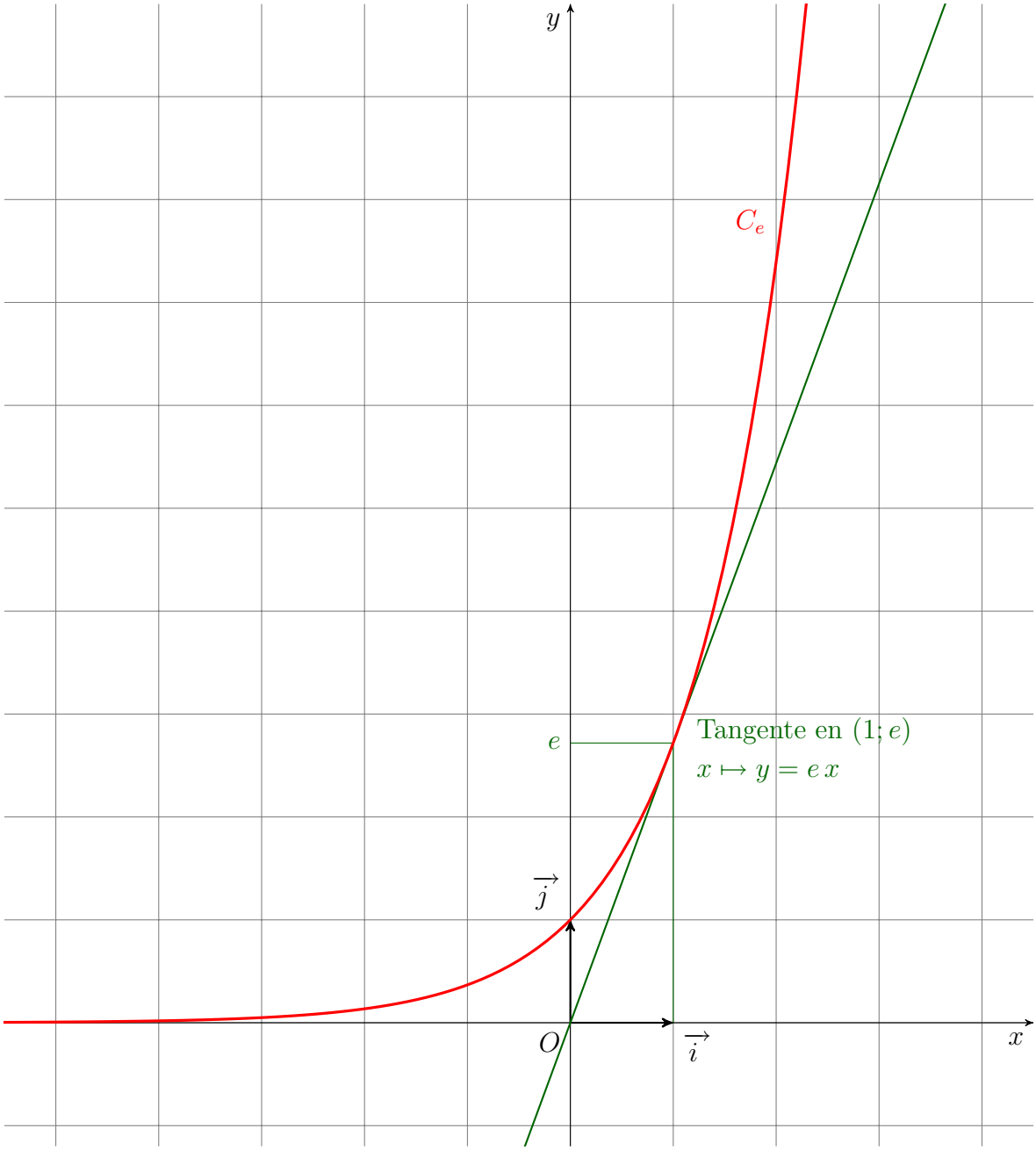
$$C_{\ln} : \quad x \longmapsto y = \ln(x)$$



$$\lim_{\substack{x\to 0\\ x>0}} \ln(x) = -\infty \quad ; \quad \ln(1) = 0 \quad ; \quad \ln(e) = 1 \quad ; \quad \lim_{x\to+\infty} \ln(x) = +\infty$$

Fonction exponentielle

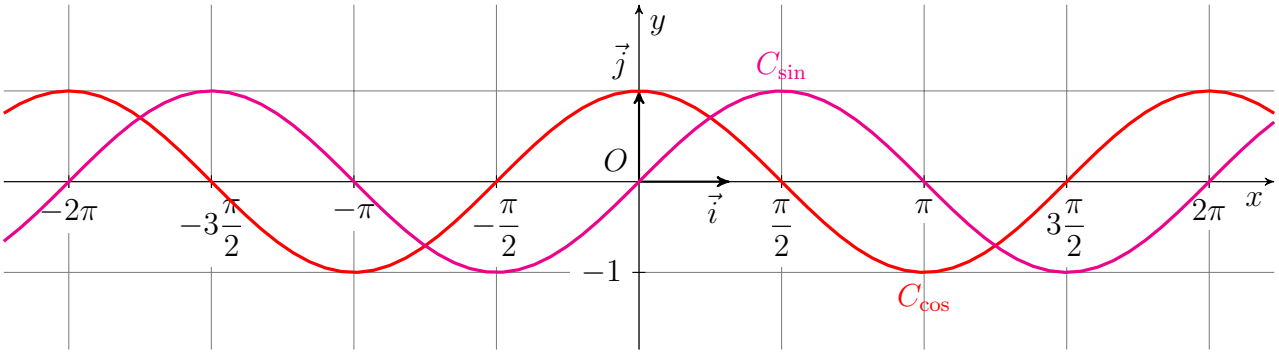
$$C_e : \quad x \longmapsto y = e^x$$



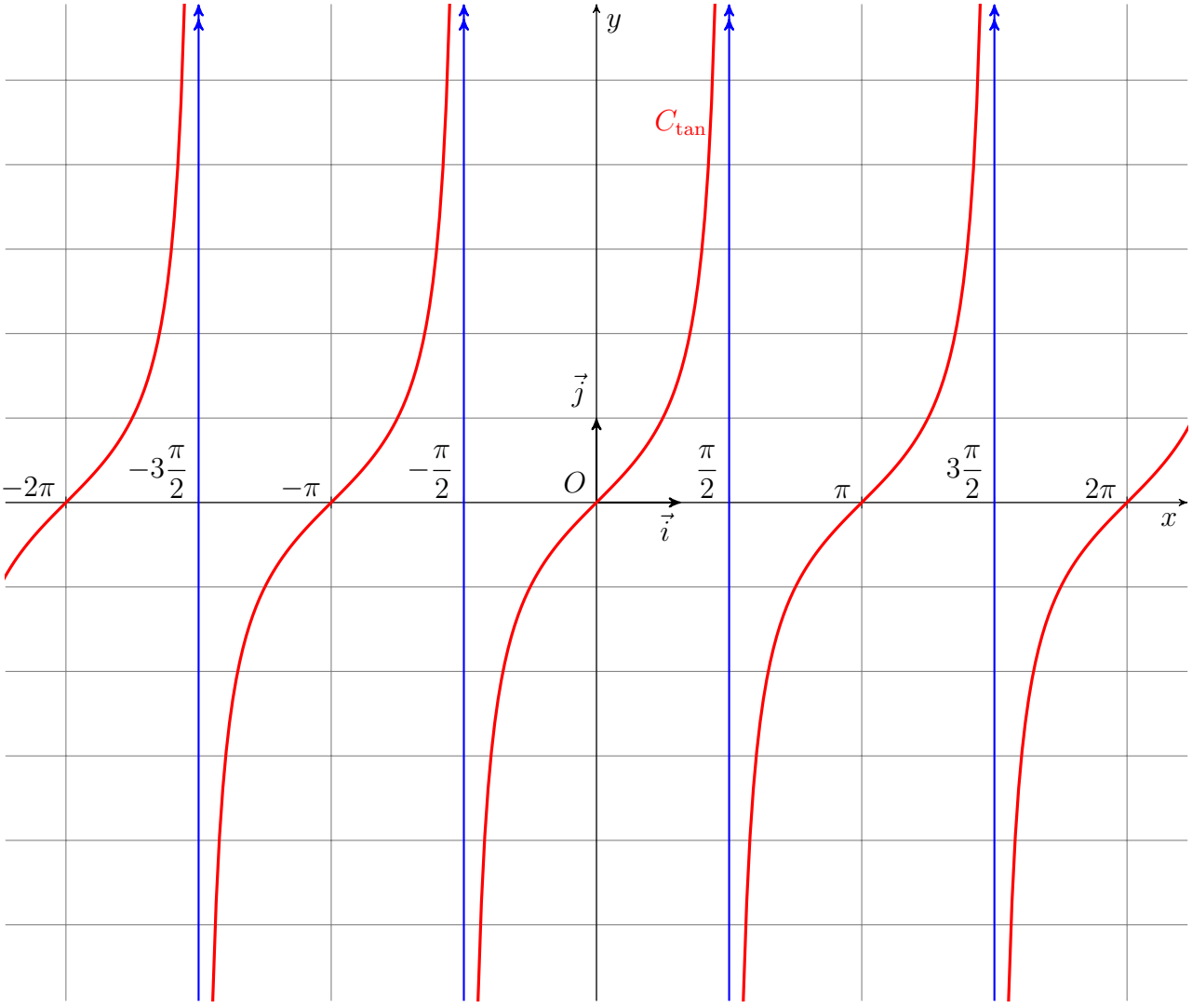
$$\lim_{x\to-\infty} e^x = 0 \quad ; \quad e^0 = 1 \quad ; \quad e^1 = e \quad ; \quad \lim_{x\to+\infty} e^x = +\infty$$

Fonctions trigonométriques cos, sin et tan

$C_{\cos}$: $x \longmapsto y = \cos(x)$ $C_{\sin}$: $x \longmapsto y = \sin(x)$

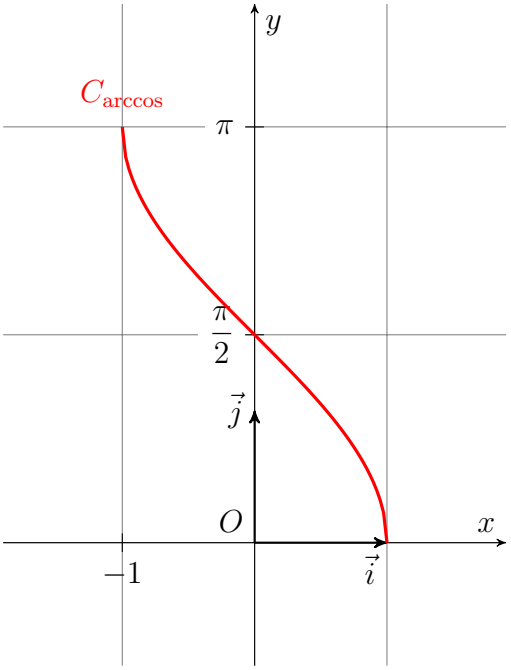


$C_{\tan}$: $x \longmapsto y = \tan(x)$

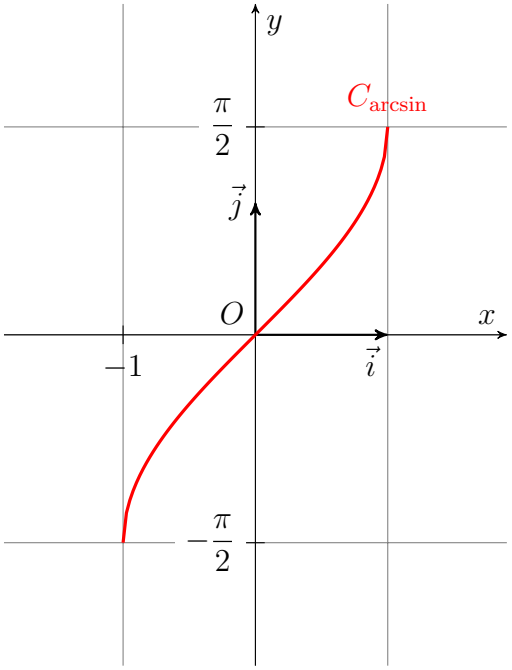


Fonctions arccos, arcsin et arctan

$C_{\arccos} : \quad x \longmapsto y = \arccos(x)$



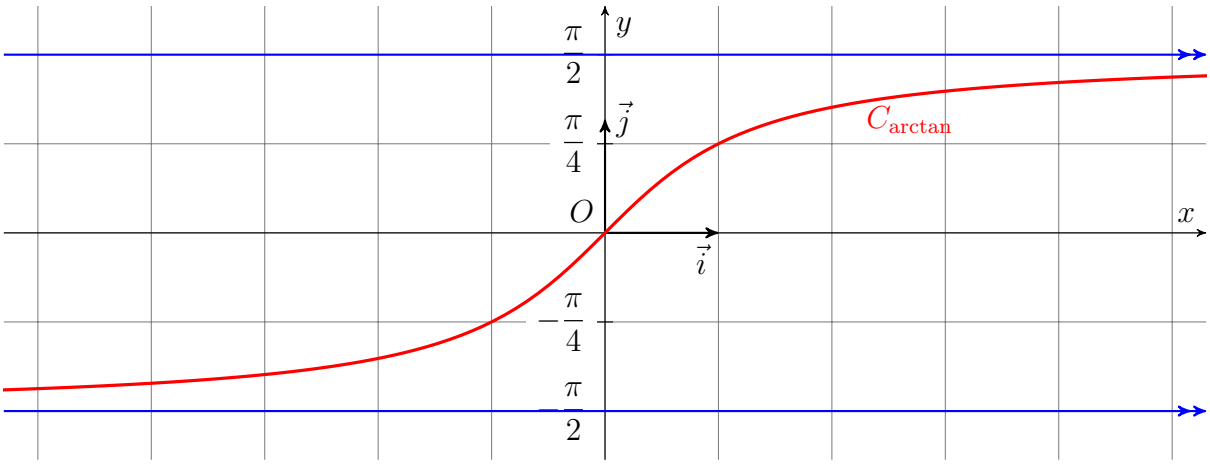
$C_{\arcsin} : \quad x \longmapsto y = \arcsin(x)$



$$\begin{aligned} \arccos(-1) &= \pi \\ \arccos(0) &= \frac{\pi}{2} \\ \arccos(1) &= 0 \end{aligned}$$

$$\begin{aligned} \arcsin(-1) &= -\frac{\pi}{2} \\ \arcsin(0) &= 0 \\ \arcsin(1) &= \frac{\pi}{2} \end{aligned}$$

$C_{\arctan} : \quad x \longmapsto y = \arctan(x)$



$$\arctan(0) = 0 \quad ; \quad \arctan(1) = \frac{\pi}{4} \quad ; \quad \lim_{x \to +\infty} \arctan(x) = \frac{\pi}{2}$$