Etude de $f : \mathbb{R} \longrightarrow \mathbb{R}$

$x \longmapsto \boxed{ax^2} + bx + c \qquad a \neq 0$

$ED_f = \mathbb{R}$

<u>Zeros:</u> $\quad f(x) = 0 \iff ax^2 + bx + c = 0 \qquad \Delta = b^2 - 4ac$

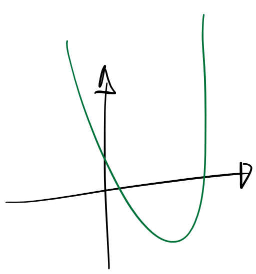
$$\iff x = \frac{-b \pm \sqrt{\Delta}}{2a} \in \mathbb{R} \text{ si } \Delta \geq 0$$

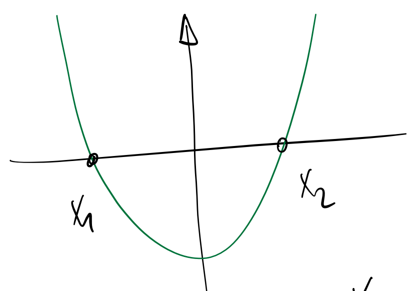
x_1 et x_2

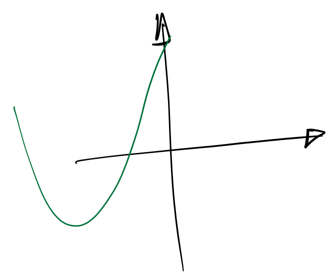
<u>Signe:</u>

$\boxed{\Delta > 0}$ $\quad$ $\boxed{a > 0}$

		x_1		x_2	
	+	0	−	0	+

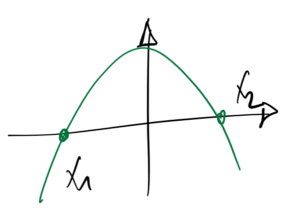






$\boxed{\Delta > 0}$ $\quad$ $\boxed{a < 0}$

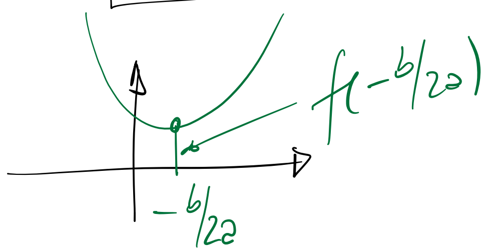
		x_1		x_2	
	−	0	+	0	−



$\boxed{\Delta < 0}$ $\boxed{a > 0}$

Signe

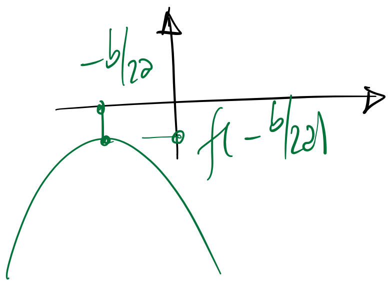
$+$

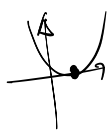


$\boxed{a < 0}$

Signe

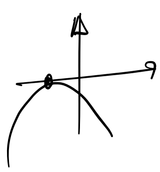
$-$



$\boxed{\Delta = 0}$  $\boxed{a > 0}$

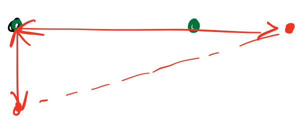
$x_1 = x_2$

$+ \quad 0 \quad +$

 $\boxed{a < 0}$

$x_1 = x_2$

$- \quad 0 \quad -$



E

S

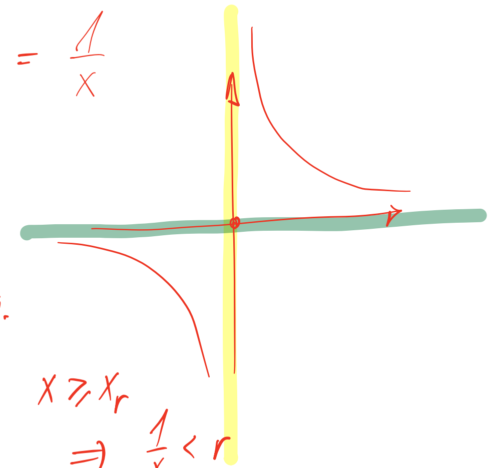
Fonction homographique

$$\mathbb{R} \longrightarrow \mathbb{R}$$
$$x \longmapsto \frac{ax+b}{cx+d}$$

$f(x) = \frac{1}{x}$

$\lim_{x \to +\infty} \frac{1}{x} = 0$

$\forall r > 0 \ \exists x_r$ tq. si $x \geq x_r$ $\Rightarrow \frac{1}{x} < r$



Exemple: $\boxed{f(x) = \frac{3x-2}{5-4x}}$

D_f : $\mathbb{R} - \{5/4\} =]-\infty; 5/4[\cup]5/4; +\infty[$

Zéros : $x = 2/3$

Valeur interdite (nombre à exclure)

Signe:

x		$0{,}\overline{6}$		$1{,}25$	
signe	$-$	0	$+$	$\|\|$	$-$

Asymptotes: $\lim_{x \to \infty} \frac{3x-2}{5-4x} = \lim_{x\to\infty} \frac{3x}{-4x} = -3/4$

$\boxed{\text{Asymptote Horizontale en } y = -3/4}$

$\lim_{x \to 5/4} \frac{3x-2}{5-4x} = \text{«} \frac{3 \cdot 5/4 - 2}{0} \text{»} = \text{«} \frac{7/4}{0} \text{»} = \infty$

$\boxed{\text{Asymptote Verticale en } x = 5/4}$

Graphe :