

Étude d'une fonction

D_f

Zéros

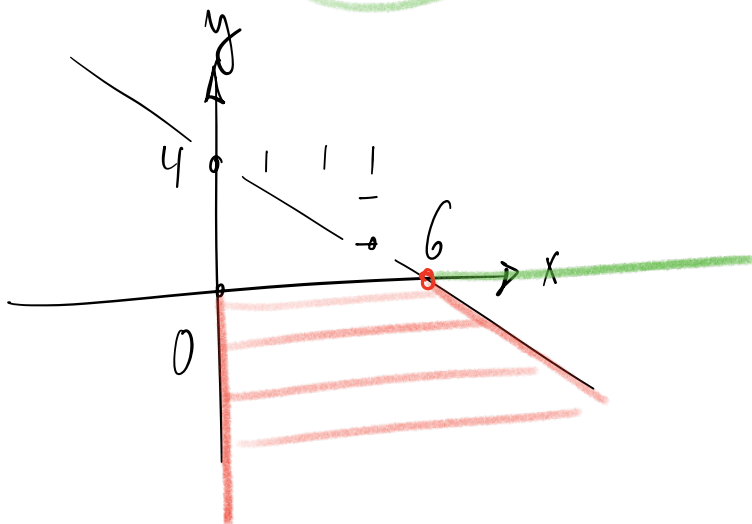
Signe

Algèbre

Équations

Inéquations

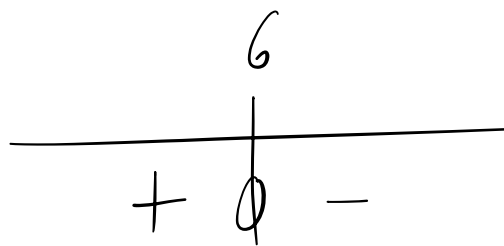
$$f(x) = 4 - \frac{2}{3}x$$



$$f(x) \leq 0$$

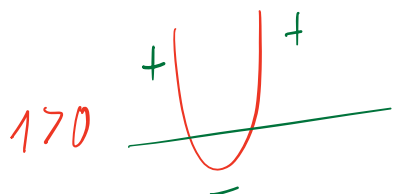
$$\Leftrightarrow x \geq 6$$

$$x \in [6; +\infty[$$



$$f(x) \leq 0 \Leftrightarrow x \geq 6$$

$$f(x) > 0 \Leftrightarrow x < 6$$



$$f(x) = 1 \cdot x^2 - 2x - 3$$

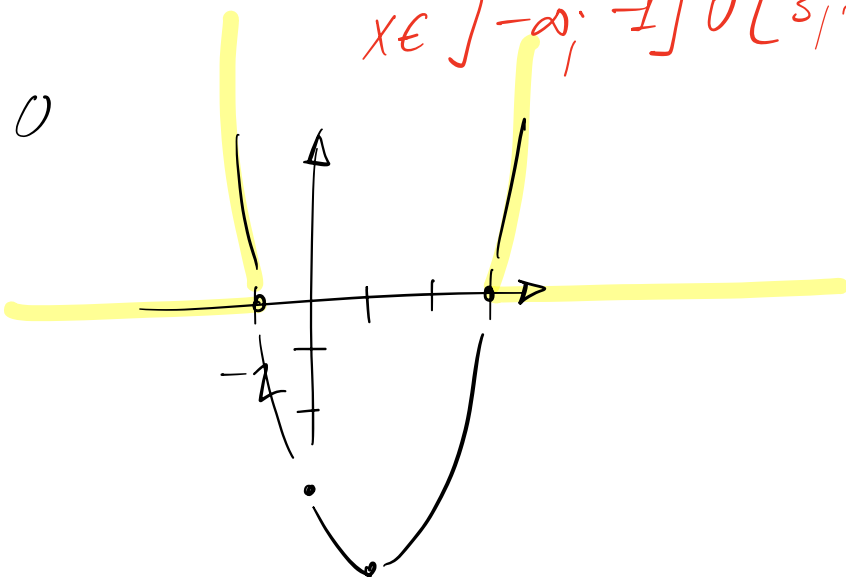
$$(x-3)(x+1) = 0$$

$$x = 3$$

$$x = -1$$

$$f(x) \geq 0$$

$$x \in]-\infty; -1] \cup [3; +\infty[$$



Étude d'une fonction du type

$$f(x) = \frac{P(x)}{Q(x)}$$

P, Q des polynômes

D_f

Zéros

Signe

$$f(x) = 0 \Leftrightarrow P(x) = 0 \text{ et } Q(x) \neq 0$$

Si $Q(x) = 0$, on exclut x .

Exemple: $f(x) = \frac{x^2 - 7x + 12}{2x - 1}$ $f(0) = -12 < 0$

Donner D_f , les zéros de f et le signe de f .

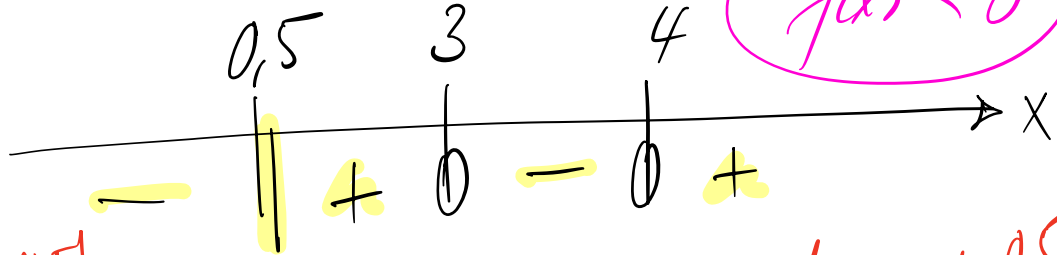
$D_f = \mathbb{R} - \{1/2\} = \mathbb{R} \setminus \{0,5\}$

$f(x) = 0 \Leftrightarrow x^2 - 7x + 12 = 0$ et $x \neq 0,5$

$\Leftrightarrow (x-3)(x-4) = 0$ et $x \neq 0,5$

$x=3$ / $x=4$ ← zéros de f .

Signe



$x \in]-\infty; 0,5[$

$\cup]3; 4[$

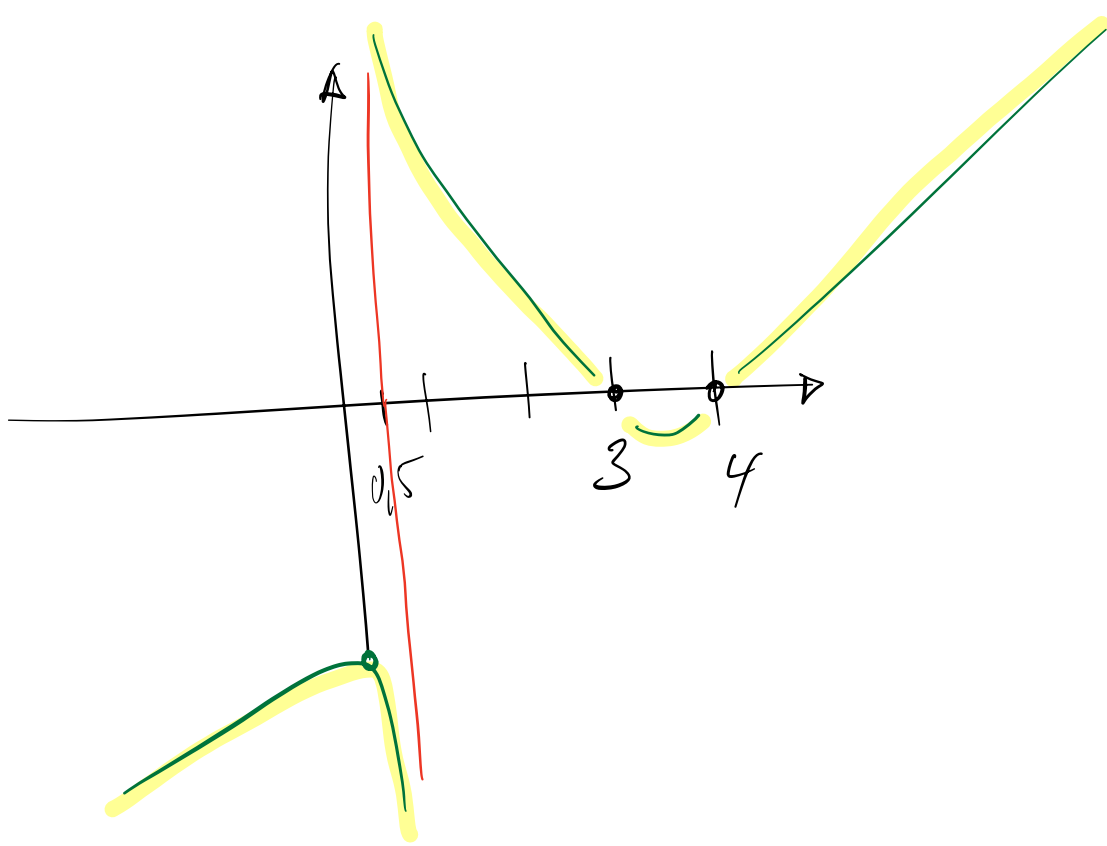
$(x-3)(x-4)$

$(2x-1)$

Pas de changement de signe après \Rightarrow de 0,5

changement de signe \Leftarrow $x=0,5$

$x < 0,5 \quad 2x-1 < 0$
 $x > 0,5 \quad 2x-1 > 0$



$$D_g \quad \text{on } g = \sqrt{f(x)} = \sqrt{\frac{x^2 - 7x + 12}{2x - 1}}$$

Même exercice pour

$$f(x) = \frac{x^2 - x - 6}{x^2 - 2x + 1}$$

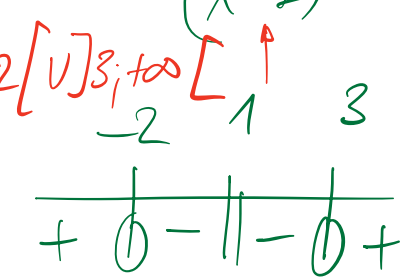
$$f(0) = \frac{-6}{1}$$

$$= \frac{(x-3)(x+2)}{(x-1)^2}$$

$D_f = \mathbb{R} - \{1\}$
 Zeros $x = -2$
 $x = 3$
 Signe

$$f(x) > 0 \Leftrightarrow x \in]-\infty; -2[\cup]3; +\infty[$$

Esquisse du graphe



3.4.23 et 3.4.26

