

Inequalities

$$\bullet (-3x + 12)(7 - 2x) \geq 0.$$

$$\hookrightarrow \mathcal{S} =]-\infty; \frac{7}{2}] \cup [4; +\infty[.$$

$$\bullet \frac{3x + 9}{x - 2} \leq 0$$

$$3x + 9 \geq 0 \Leftrightarrow x \geq -3$$

$$x - 2 > 0 \Leftrightarrow x > 2$$

x	$-\infty$	-3	2	$+\infty$
$3x-9$	$-$	$\emptyset$	$+$	$+$
$x-2$	$-$	$\vdots$	$-$	$+$
$\frac{3x-9}{x-2}$	$+$	$\emptyset$	$-$	$+$

$$g = [-3; 2]$$

$$\bullet \frac{-2x + 3}{x + 4} \geq 0.$$

x	$-\infty$	-4	$\frac{3}{2}$	$+\infty$
$-2x+3$	+	;	+	-
$x+4$	-	ϕ	;	+
$\frac{-2x+3}{x+4}$	-		ϕ	-

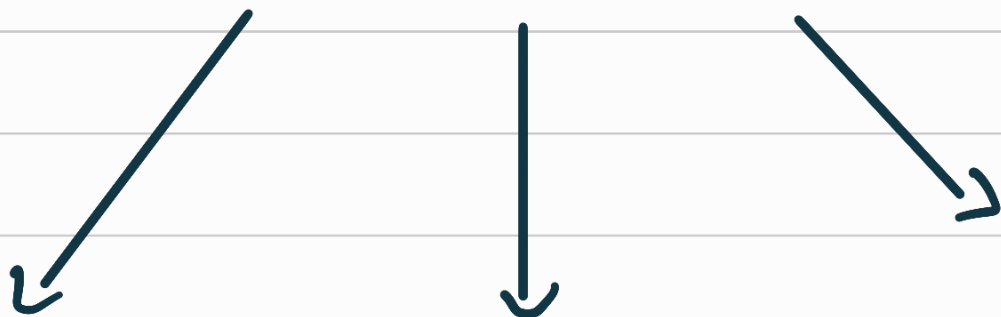
$$-2x + 3 > 0$$

$$-2x > -3$$

$$x \leq \frac{-3}{-2} = \frac{3}{2}$$

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

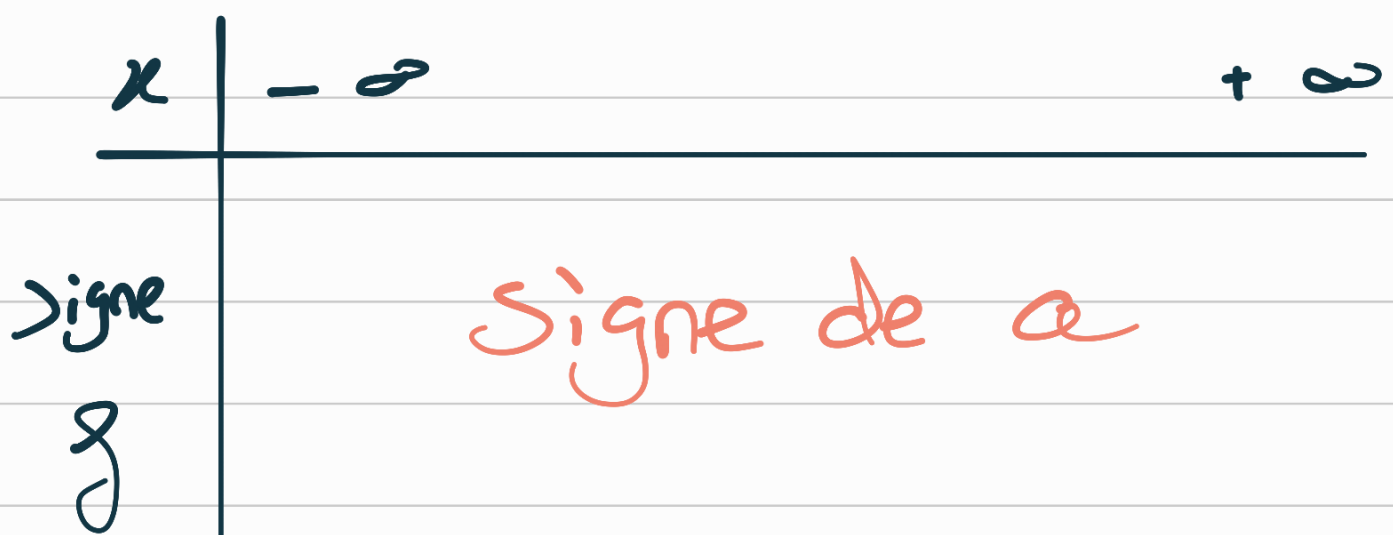
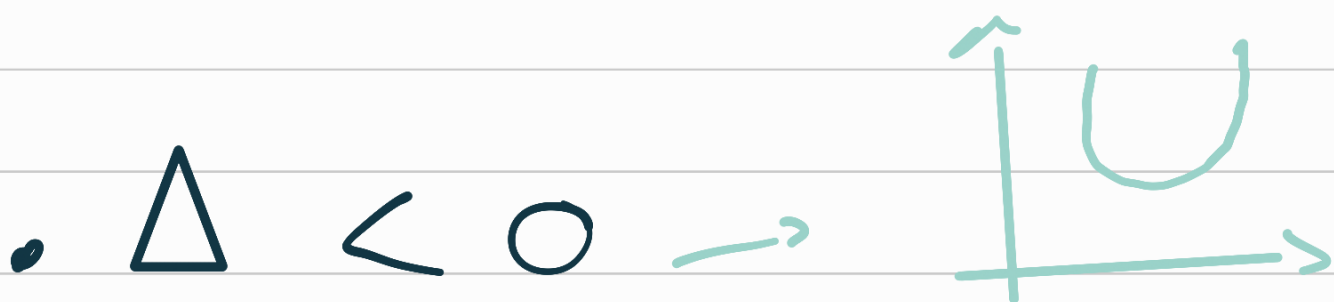
$$\rightarrow \Delta = b^2 - 4ac = \text{nombre}$$



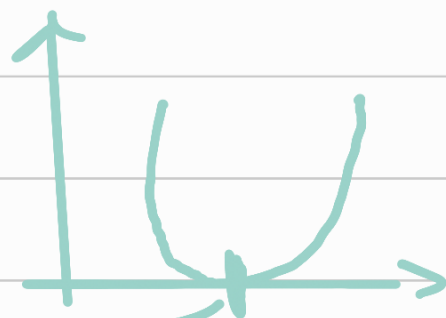
$$\Delta < 0$$

$$\Delta = 0$$

$$\Delta > 0$$



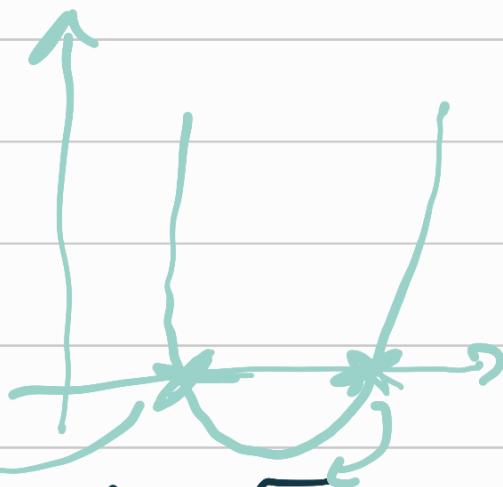
• $\Delta = 0$



x	$-\infty$	$-b/2a$	$+\infty$
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Signe	signe de a	signe de a	signe de a
f		$\circ$	

• $\Delta > 0$



x	$-\infty$	$\frac{-b - \sqrt{\Delta}}{2a}$	$\frac{-b + \sqrt{\Delta}}{2a}$	$+\infty$
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signe de a	signe de a	signe de $-a$	signe de a
		$\circ$	$\circ$

$$\cdot f(x) = \underset{a}{3}x^2 - \underset{b}{4}x + \underset{c}{1}$$

$$\Delta = b^2 - 4ac$$

$$= (-4)^2 - 4 \times 3 \times 1$$

$$= 16 - 12$$

$$= 4 > 0$$

$$x_1 = \frac{-b - \sqrt{\Delta}}{2a}$$

$$= \frac{-(-4) - \sqrt{4}}{2 \times 3}$$

$$= \frac{4 - 2}{6} = \frac{2}{6} = \frac{1}{3}$$

$$x_2 = \frac{-b + \sqrt{\Delta}}{2a}$$

$$= \frac{-(-4) + \sqrt{4}}{2 \times 3}$$

$$= \frac{4 + 2}{6}$$

$$= \frac{6}{6} = 1$$

x	$-\infty$	$\frac{4}{3}$	1	$+\infty$
signe de g	+	$\bigcirc$	- $\bigcirc$	+

$$f(x) = \underbrace{\frac{1}{3}}_a x^2 - \underbrace{2}_b x + \underbrace{3}_c$$

$$\Delta = b^2 - 4ac$$

$$= (-2)^2 - 4 \times \cancel{\frac{1}{3}} \times \cancel{3} = 1$$

$$= 4 - 4$$

$$= 0$$

$$x_0 = \frac{-b}{2a} = \frac{-(-2)}{2 \times \frac{1}{3}} = \frac{2}{\frac{2}{3}} = 3$$

x	$-\infty$	3	$+\infty$
Signe de g	$+$	0	$-$

