

TRINOMES

Forme développée

$\forall x \in \mathbb{R}, f(x) = ax^2 + bx + c$
avec $a, b, c \in \mathbb{R}$ les coefficients du trinôme tels que $a \neq 0$

Discriminant

Résoudre l'équation $ax^2 + bx + c = 0$

$$\Delta = b^2 - 4ac, \Delta \text{ se lit "delta"}$$

Remarque : les solutions de cette équation s'appellent racines

$\Delta < 0$	$\Delta = 0$	$\Delta > 0$	
pas de racine	1 racine	2 racines	
	$x_0 = \frac{-b}{2a}$	$x_1 = \frac{-b - \sqrt{\Delta}}{2a}$	$x_2 = \frac{-b + \sqrt{\Delta}}{2a}$

Forme Factorisée

$\Delta < 0$	$\Delta = 0$	$\Delta > 0$
pas de factorisation	$\forall x \in \mathbb{R}, f(x) = a(x - x_0)^2$	$\forall x \in \mathbb{R}, f(x) = a(x - x_1)(x - x_2)$

Forme canonique

$$\forall x \in \mathbb{R}, f(x) = a(x - \alpha)^2 + \beta$$

$$\text{avec } \alpha = -\frac{b}{2a} \text{ et } \beta = f(\alpha)$$

Remarque : (α, β) est le sommet de la parabole

Signes

$\Delta < 0$			$\Delta = 0$				$\Delta > 0$					
x	$-\infty$	$+\infty$	x	$-\infty$	x_0	$+\infty$	x	$-\infty$	x_1	x_2	$+\infty$	
$f(x)$	signe de a		$f(x)$	signe de a	0	signe de a	$f(x)$	signe de a	0	signe de $-a$	0	signe de a

Variations

x	$-\infty$	α	$+\infty$
$f(x)$	↗		↘
<i>concave</i>			
x	$-\infty$	α	$+\infty$
$f(x)$	↘		↗
<i>convexe</i>			

Représentation graphique

	$a < 0$	$a > 0$
$\Delta < 0$	<p>A coordinate system showing a downward-opening parabola. The vertex is at (α, β). The x-axis is labeled with 0 and α. The y-axis is labeled with 0 and β. The parabola is entirely above the x-axis.</p>	<p>A coordinate system showing an upward-opening parabola. The vertex is at (α, β). The x-axis is labeled with 0 and α. The y-axis is labeled with 0 and β. The parabola is entirely above the x-axis.</p>
$\Delta = 0$	<p>A coordinate system showing a downward-opening parabola. The vertex is at $(\alpha, 0)$ on the x-axis. The x-axis is labeled with 0 and $\alpha = x_0$. The y-axis is labeled with 0 and $\beta = 0$.</p>	<p>A coordinate system showing an upward-opening parabola. The vertex is at $(\alpha, 0)$ on the x-axis. The x-axis is labeled with 0 and $\alpha = x_0$. The y-axis is labeled with 0 and $\beta = 0$.</p>
$\Delta > 0$	<p>A coordinate system showing a downward-opening parabola. The vertex is at (α, β). The x-axis has two roots labeled x_1 and x_2. The x-axis is labeled with 0 and α. The y-axis is labeled with 0 and β.</p>	<p>A coordinate system showing an upward-opening parabola. The vertex is at (α, β). The x-axis has two roots labeled x_1 and x_2. The x-axis is labeled with 0 and α. The y-axis is labeled with 0 and β.</p>