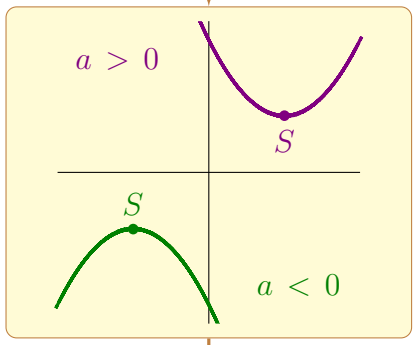
$$P(x) = ax^2 + bx + c$$

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

$\Delta < 0$

Pas de racine dans $\mathbb{R}$

Pas de factorisation



x	$-\infty$	$+\infty$
$P(x)$	$\mathrm{sgn}(a)$	

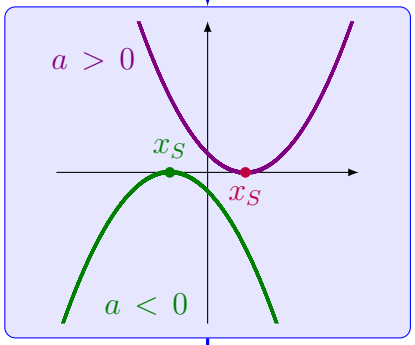
$\mathrm{sgn}(a)$: signe de a

$\Delta = 0$

Une racine « double » :

$$x_S = \frac{-b}{2a}$$

Factorisation :
$a(x - x_S)^2$



x	$-\infty$	x_S	$+\infty$
$P(x)$	$\mathrm{sgn}(a)$	0	$\mathrm{sgn}(a)$

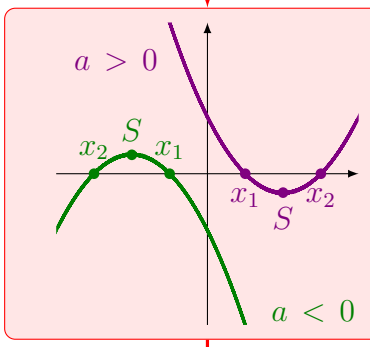
$\Delta > 0$

Les racines sont :

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

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

Factorisation :
$a(x - x_1)(x - x_2)$



x	$-\infty$	x_1		x_2	$+\infty$
$P(x)$	$\mathrm{sgn}(a)$	0	$\mathrm{sgn}(-a)$	0	$\mathrm{sgn}(a)$

$\mathrm{sgn}(-a)$: signe opposé de a