Lycée Des Arts — Mathematics — 10^{th}-Grade

Name: .... "Quadratic functions and inequalities" — S.S-14

The complete form of a quadratic function is given by: $h(x) = ax^2 + bx + c$

To solve a quadratic inequality of the form $ax^2 + bx + c < or > 0$ follow me on:

1. Write the given quadratic inequality in the form $h(x) = (x-h)^2 + k$ "by completing the square"
2. Graph the function: $h(x) = (x-h)^2 + k$ "carefully".
3. Specify the x - intercepts of $h(x)$ "by solving $(x-h)^2 + k = 0$"
4. Detect the sign of the inequality:

$h(x) = ax^2 + bx + c > 0$	$h(x) = ax^2 + bx + c < 0$
Then take values of x for which the graph is	
Strictly above the $x - axis$	***Strictly below*** the $x - axis$

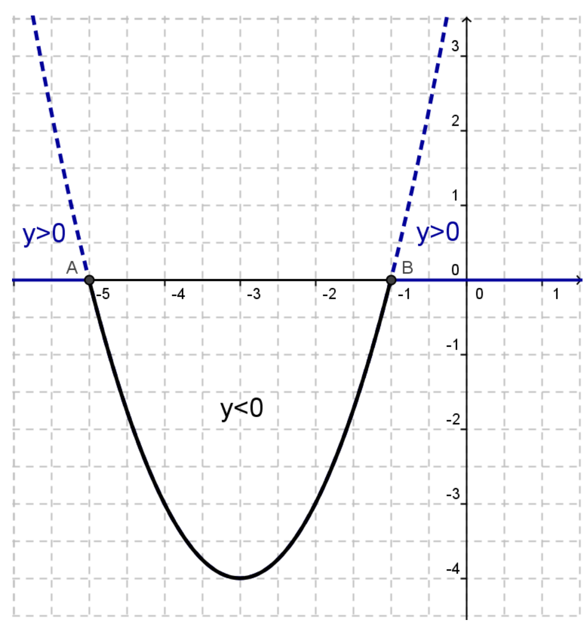
Solve graphically the following inequality: $h(x) = x^2 - 6x + 5 \geq 0$

1st - Step: Change form: $h(x) = x^2 - 6x + 5 = (x+3)^2 - 4$, which is a parabola of vertex $V(-3;-4)$

2nd - Step: Graph $h(x)$

3rd – Step: Specify x - intercepts: $A(-5;0)$ and $B(-1;0)$.

4th - Step: Detect given sign: $h(x) \geq 0$



Thus, $x \in]-\infty;-5] \cup [-1;+\infty[$