Vertex of the Quadratic

Given a quadratic $j(c) = a\,c^2 + b\,c + c$ compute its value at
$c_1 = -\frac{b}{2a}$ namely $j(c_1) = c - \frac{b^2}{4a}$
Now compute the same quadratic at $c_1 + h$, namely
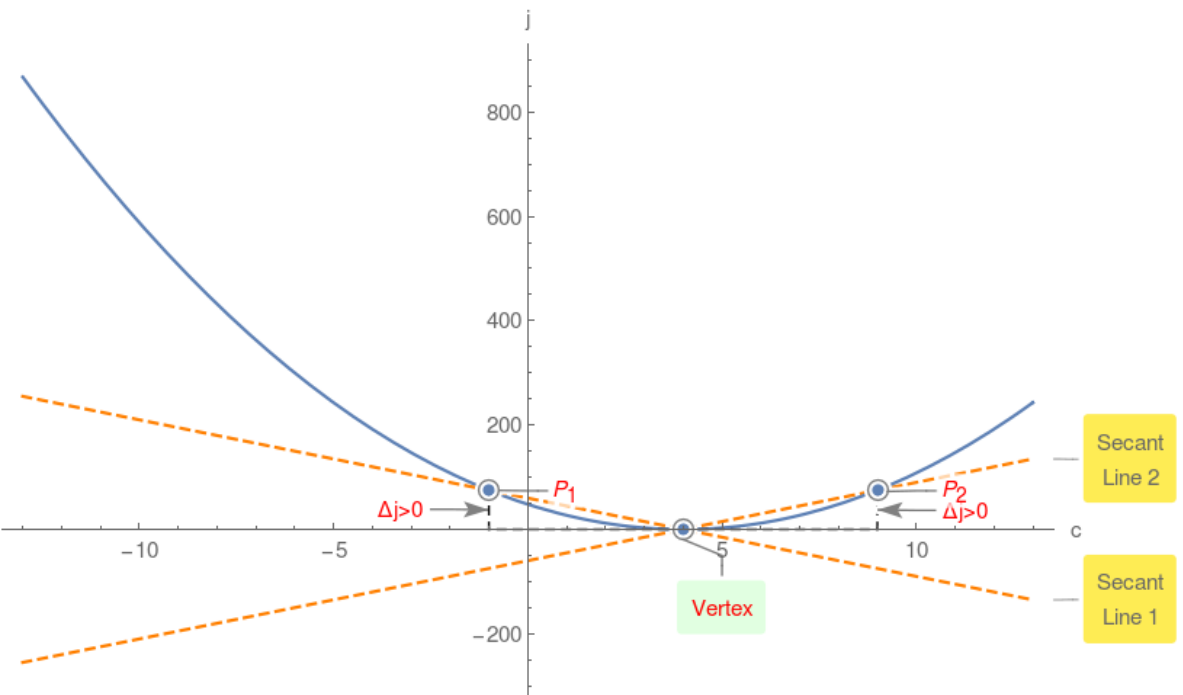$j(c_1 + h) = -\frac{b^2}{4a} + a\,h^2 + c$
Compute $\triangle = j(c_1 + h) - j(c_1) = a\,h^2$
Since $h^2 > 0$, therefore if $\boxed{a > 0}$ then $\triangle > 0$ or vertex is the global minimum!

Example 1.
$j(c) = 3\,c^2 - 24\,c + 48$

However if $\boxed{a < 0}$ then $\triangle < 0$ or vertex is the global maximum!

Example 2.
$j(c) = -3\,c^2 - 24\,c + 50$