Vertex of the Quadratic

Given a quadratic $e(d) = a\,d^2 + b\,d + c$ compute its value at
$d_1 = -\frac{b}{2a}$ namely $e(d_1) = c - \frac{b^2}{4a}$
Now compute the same quadratic at $d_1 + h$, namely
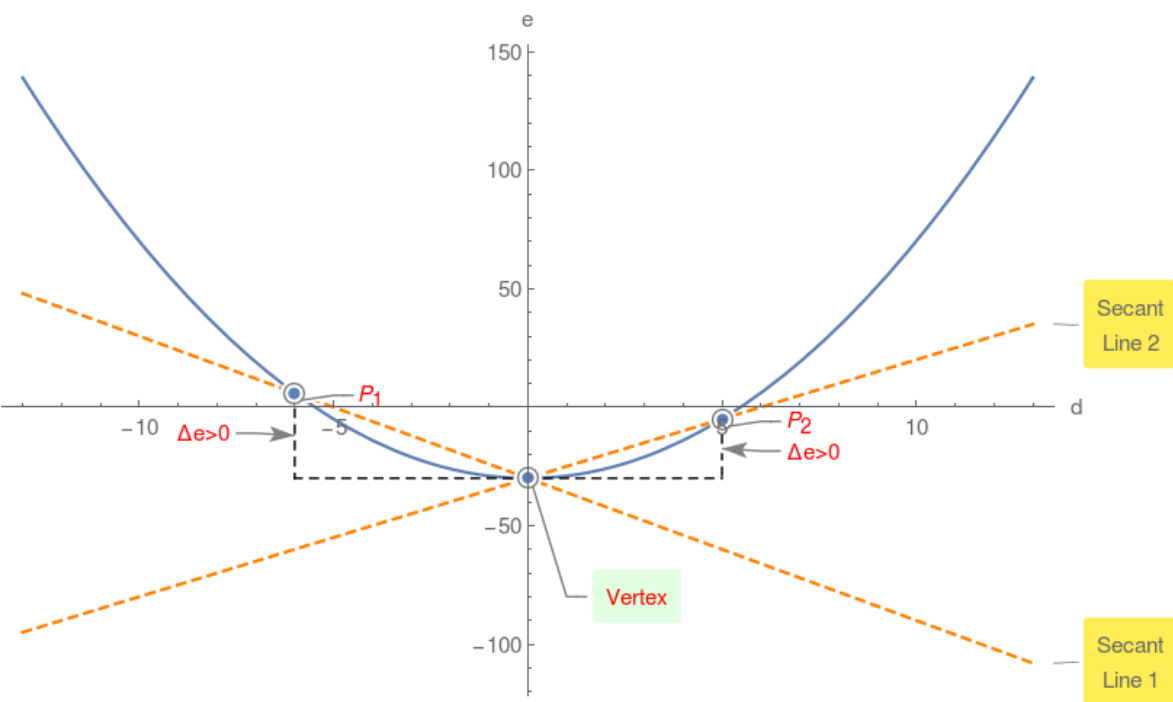$e(d_1 + h) = -\frac{b^2}{4a} + a\,h^2 + c$
Compute $\triangle = e(d_1 + h) - e(d_1) = a\,h^2$
Since $h^2 > 0$, therefore if $\boxed{a > 0}$ then $\triangle > 0$ or vertex is the
global minimum!

Example 1.
$e(d) = d^2 - 30$

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

Example 2.
$e(d) = -2\,d^2 - 16\,d - 41$