Vertex of the Quadratic

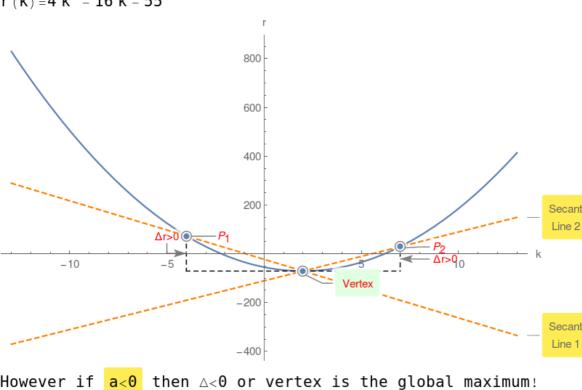
Given a quadratic $r(k) = a k^2 + b k + c$ compute its value at $k_1 = -\frac{b}{2a}$ namely $r(k_1) = c - \frac{b^2}{4a}$

Now compute the same quadratic at $\mathsf{k}_{1^+}\mathsf{h}$, namely $r\;(\;k_1\!+\!h\;) = -\; \tfrac{b^2}{4\;a}\; +\; a\;h^2\; +\; c\;$

Compute $\triangle = r(k_1+h) - r(k_1) = a h^2$

Since $h^2 > 0$, therefore if a > 0 then $\triangle > 0$ or vertex is the global minimum:

Example 1. $r(k) = 4 k^2 - 16 k - 55$



Example 2.

