Vertex of the Quadratic

Given a quadratic $c(m) = a m^2 + b m + c$ compute its value at $m_1 = -\frac{b}{2a}$ namely $c(m_1) = c - \frac{b^2}{4a}$

Now compute the same quadratic at $\mathtt{m}_{1} ext{+}\mathtt{h}$, namely $c (m_1 + h) = -\frac{b^2}{4a} + a h^2 + c$

Compute $\triangle = c(m_1 + h) - c(m_1) = a h^2$

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

global minimum!

Example 1. $c(m) = 4 m^2 + 8 m - 64$



