

Vertex of the Quadratic

Given a quadratic $n(c) = ac^2 + bc + c$ compute its value at

$$c_1 = -\frac{b}{2a} \text{ namely } n(c_1) = c - \frac{b^2}{4a}$$

Now compute the same quadratic at c_1+h , namely

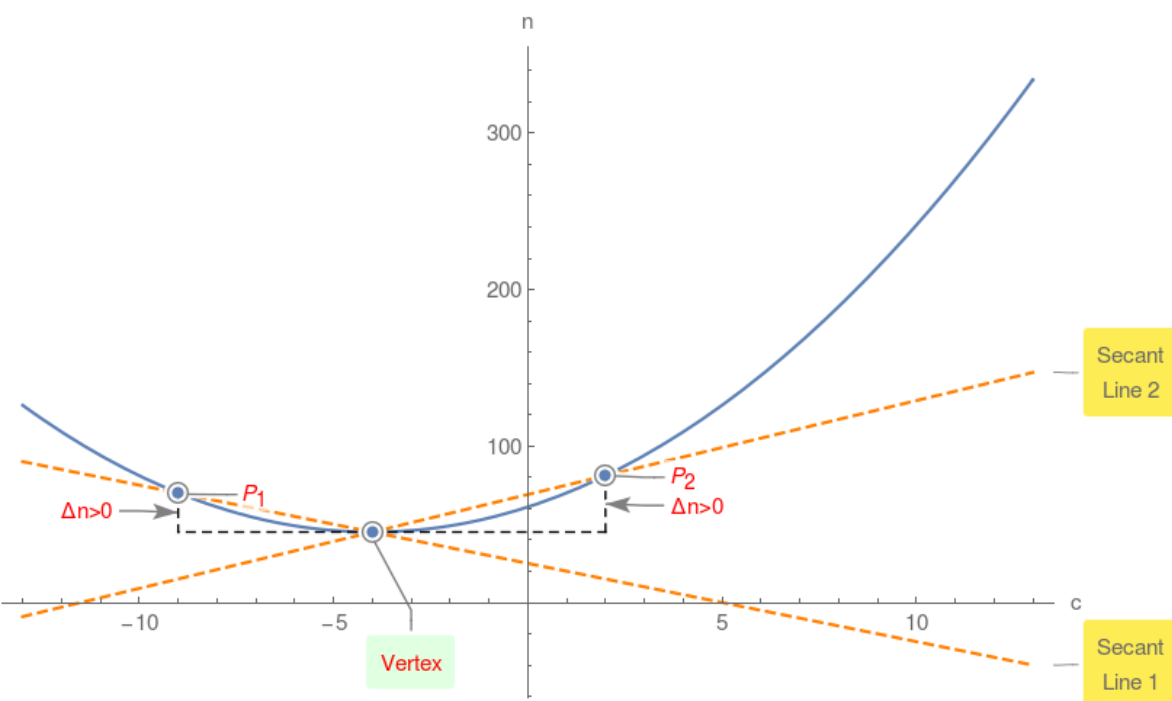
$$n(c_1+h) = -\frac{b^2}{4a} + ah^2 + c$$

$$\text{Compute } \Delta = n(c_1+h) - n(c_1) = ah^2$$

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

Example 1.

$$n(c) = c^2 + 8c + 61$$



However if $a < 0$ then $\Delta < 0$ or vertex is the global maximum!

Example 2.

$$n(c) = -3c^2 + 18c - 68$$

