

Vertex of the Quadratic

Given a quadratic $j(y) = ay^2 + by + c$ compute its value at

$y_1 = -\frac{b}{2a}$ namely $j(y_1) = c - \frac{b^2}{4a}$

Now compute the same quadratic at $y_1 + h$, namely

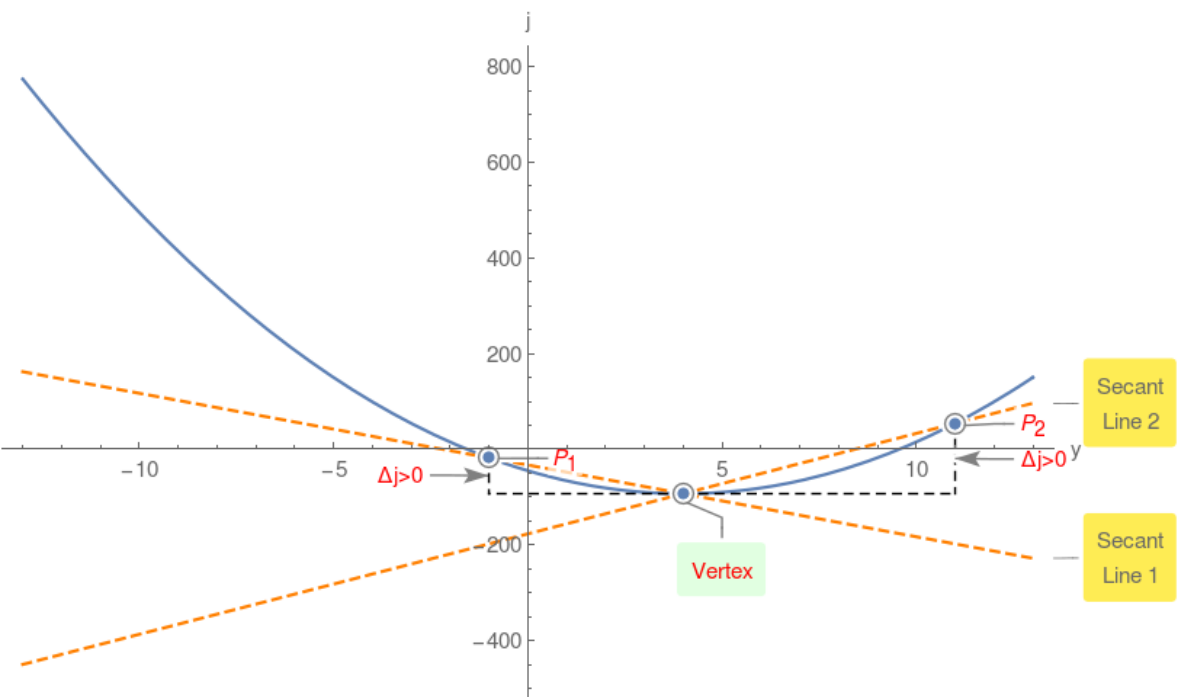
$j(y_1 + h) = -\frac{b^2}{4a} + ah^2 + c$

Compute $\Delta = j(y_1 + h) - j(y_1) = ah^2$

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

Example 1.

$$j(y) = 3y^2 - 24y - 45$$



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

Example 2.

$$j(y) = -y^2 + 4y + 59$$

