

Intercepts of the Quadratic

Given a quadratic $y(h) = ah^2 + bh + c$ compute its discriminant Δ :

$$\Delta = \sqrt{b^2 - 4ac}$$

Case1: $\Delta > 0$

$h_{1,2} = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ computes the h-intercepts of multiplicity 1.

$y(0) = c$ computes the single y-intercept.

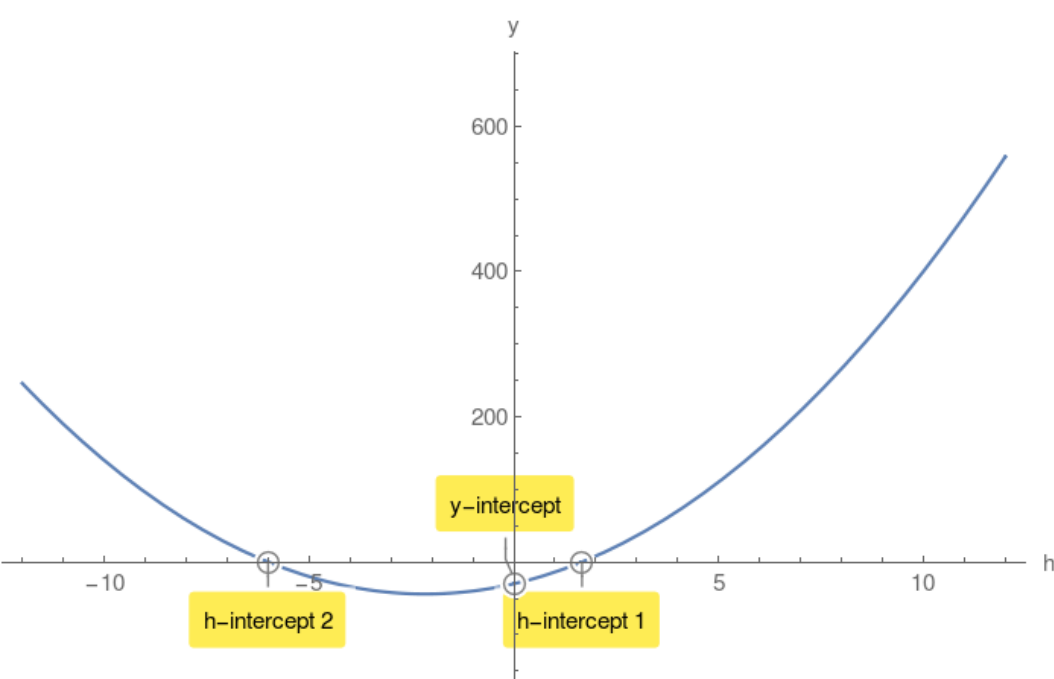
Example 1.

$y(h) = 3h^2 + 13h - 30$ compute its discriminant Δ :

$$\Delta = 529 > 0$$

$$h_{1,2} = \frac{5}{3}, -6$$

$y(0) = -30$ y-intercept.



Case2: $\Delta = 0$

$h_{1,2} = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} = \frac{-b \pm 0}{2a} = \frac{-b}{2a}$ single h-intercept of multiplicity 2.

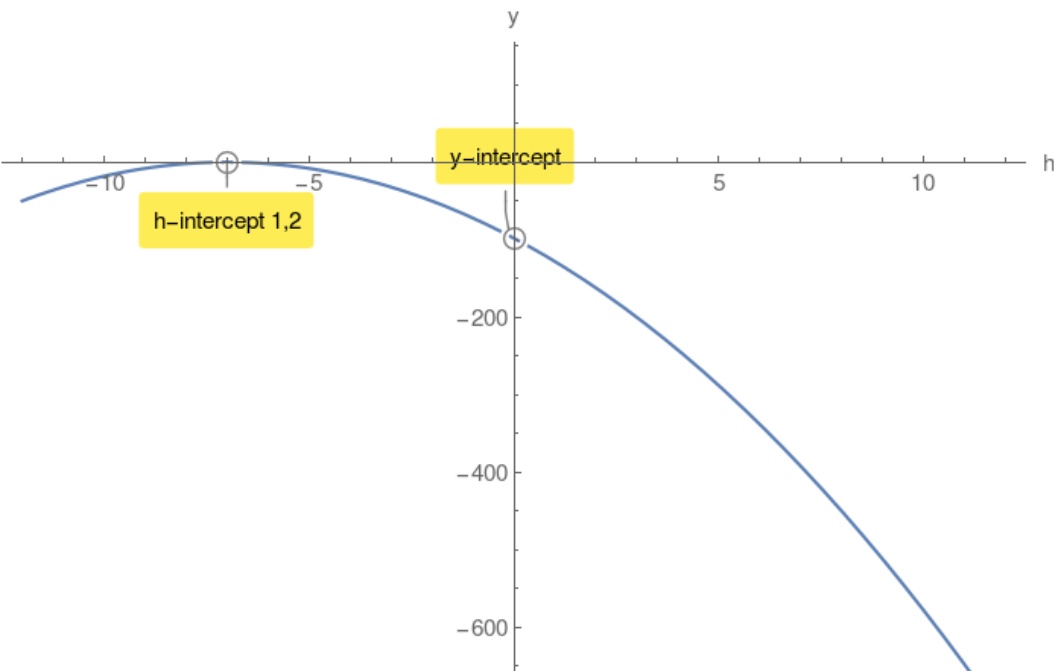
Example 2.

$y(h) = -2h^2 - 28h - 98$ compute its discriminant Δ :

$$\Delta = 0$$

$$h_{1,2} = -7, -7$$

$y(0) = -98$ y-intercept.



Case3: $\Delta < 0$

$\sqrt{b^2 - 4ac}$ has no value in Real Numbers. Therefore there are no h-intercepts.

However there is a y-intercept.

Example 3.

$y(h) = 4h^2 + 72h + 405$ compute its discriminant Δ :

$$\Delta = -1296 < 0$$

$y(0) = 405$ y-intercept.

