

Intercepts of the Quadratic

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

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

Case1: $\Delta > 0$

$y_{1,2} = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ computes the y-intercepts of multiplicity 1.
 $h(0) = c$ computes the single h-intercept.

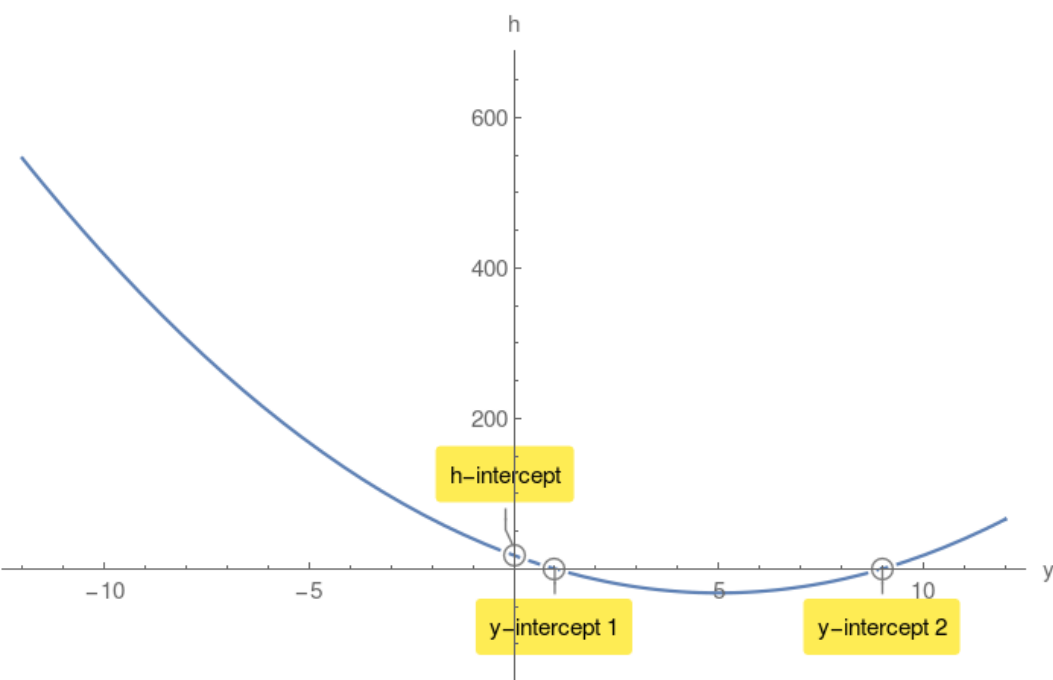
Example 1.

$h(y) = 2y^2 - 20y + 18$ compute its discriminant Δ :

$$\Delta = 256 > 0$$

$$y_{1,2} = 1, 9$$

$h(0) = 18$ h-intercept.



Case2: $\Delta = 0$

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

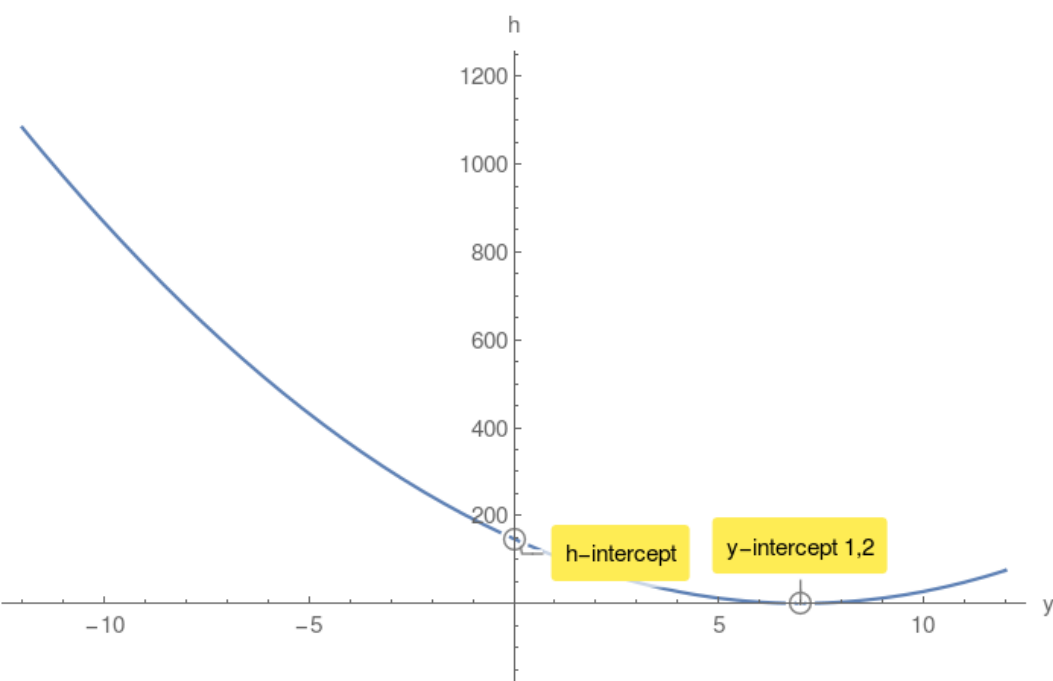
Example 2.

$h(y) = 3y^2 - 42y + 147$ compute its discriminant Δ :

$$\Delta = 0$$

$$y_{1,2} = 7, 7$$

$h(0) = 147$ h-intercept.



Case3: $\Delta < 0$

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

However there is a h-intercept.

Example 3.

$h(y) = -9y^2 - 144y - 640$ compute its discriminant Δ :

$$\Delta = -2304 < 0$$

$h(0) = -640$ h-intercept.

