

Intercepts of the Quadratic

Given a quadratic $e(h) = ah^2 + bh + c$ 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.
 $e(0) = c$ computes the single e-intercept.

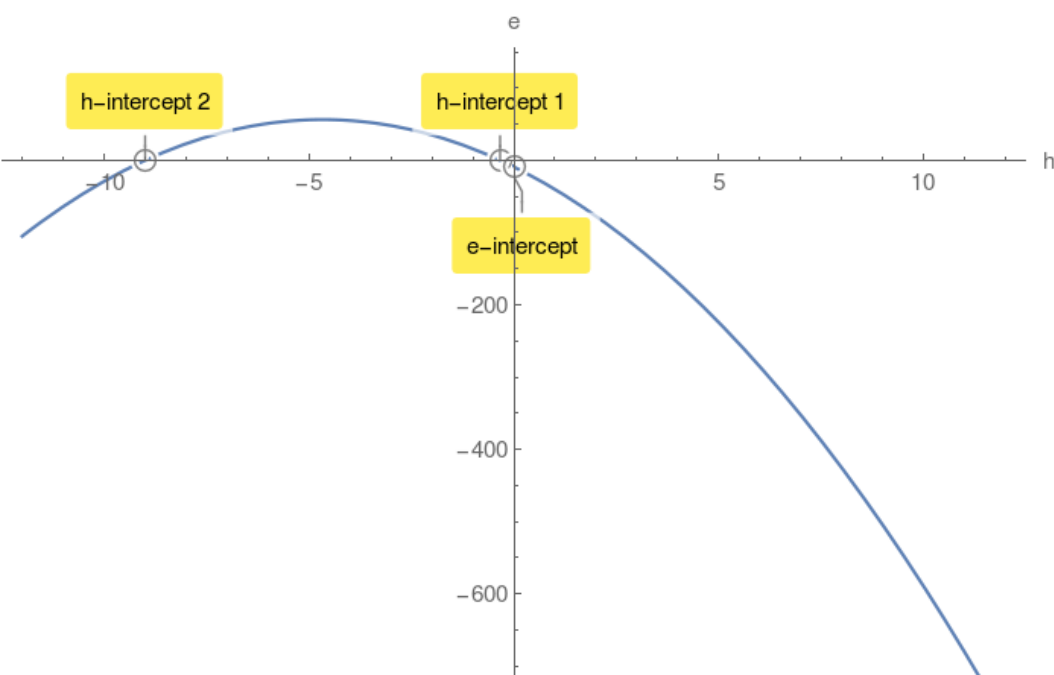
Example 1.

$e(h) = -3h^2 - 28h - 9$ compute its discriminant Δ :

$$\Delta = 676 > 0$$

$$h_{1,2} = -\frac{1}{3}, -9$$

$e(0) = -9$ e-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.

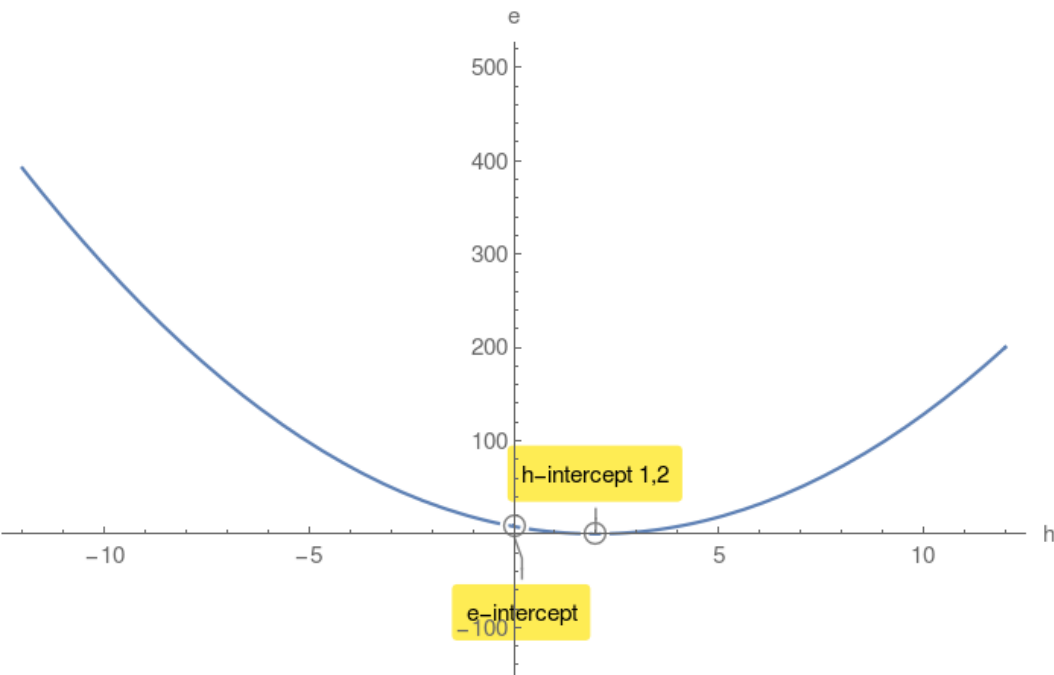
Example 2.

$e(h) = 2h^2 - 8h + 8$ compute its discriminant Δ :

$$\Delta = 0$$

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

$e(0) = 8$ e-intercept.



Case3: $\Delta < 0$

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

However there is a e-intercept.

Example 3.

$e(h) = 4h^2 + 64h + 320$ compute its discriminant Δ :

$$\Delta = -1024 < 0$$

$e(0) = 320$ e-intercept.

