

Intercepts of the Quadratic

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

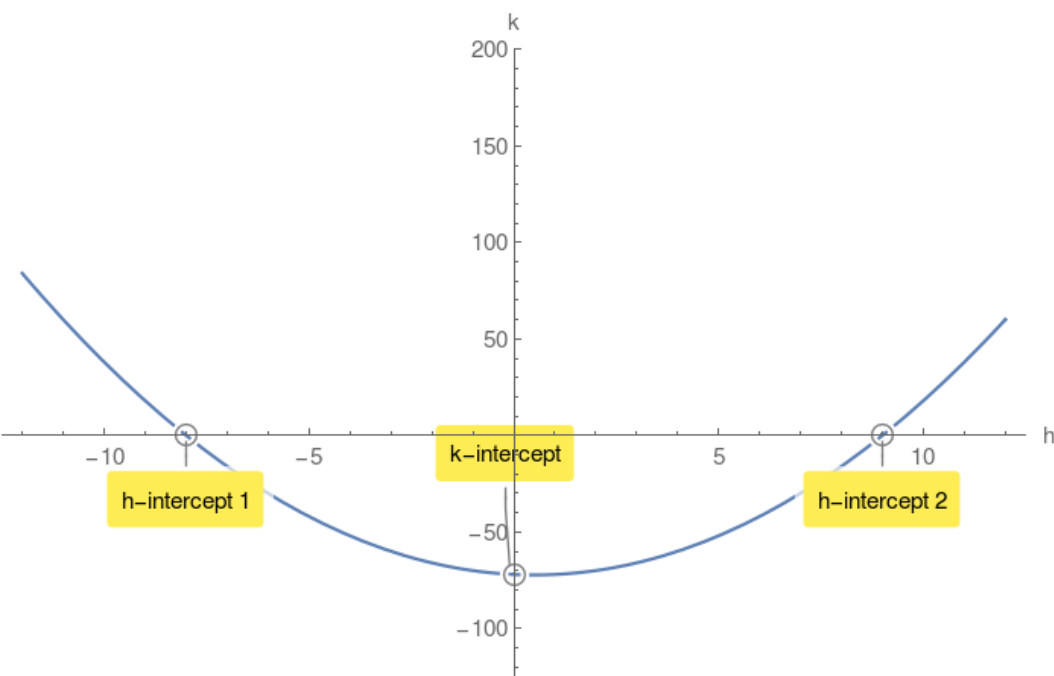
Example 1.

$k(h) = h^2 - h - 72$ compute its discriminant Δ :

$$\Delta = 289 > 0$$

$$h_{1,2} = -8, 9$$

$k(0) = -72$ k-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.

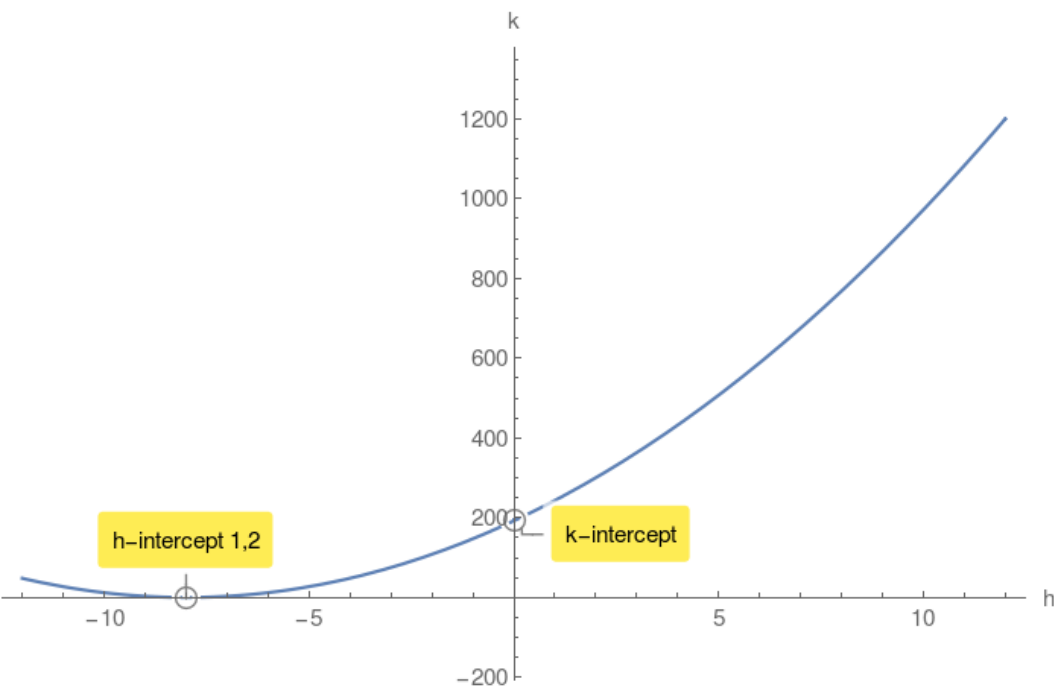
Example 2.

$k(h) = 3h^2 + 48h + 192$ compute its discriminant Δ :

$$\Delta = 0$$

$$h_{1,2} = -8, -8$$

$k(0) = 192$ k-intercept.



Case3: $\Delta < 0$

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

However there is a k-intercept.

Example 3.

$k(h) = 4h^2 + 80h + 500$ compute its discriminant Δ :

$$\Delta = -1600 < 0$$

$k(0) = 500$ k-intercept.

