

Intercepts of the Quadratic

Given a quadratic $k(y) = ay^2 + by + c$ 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.
 $k(0) = c$ computes the single k-intercept.

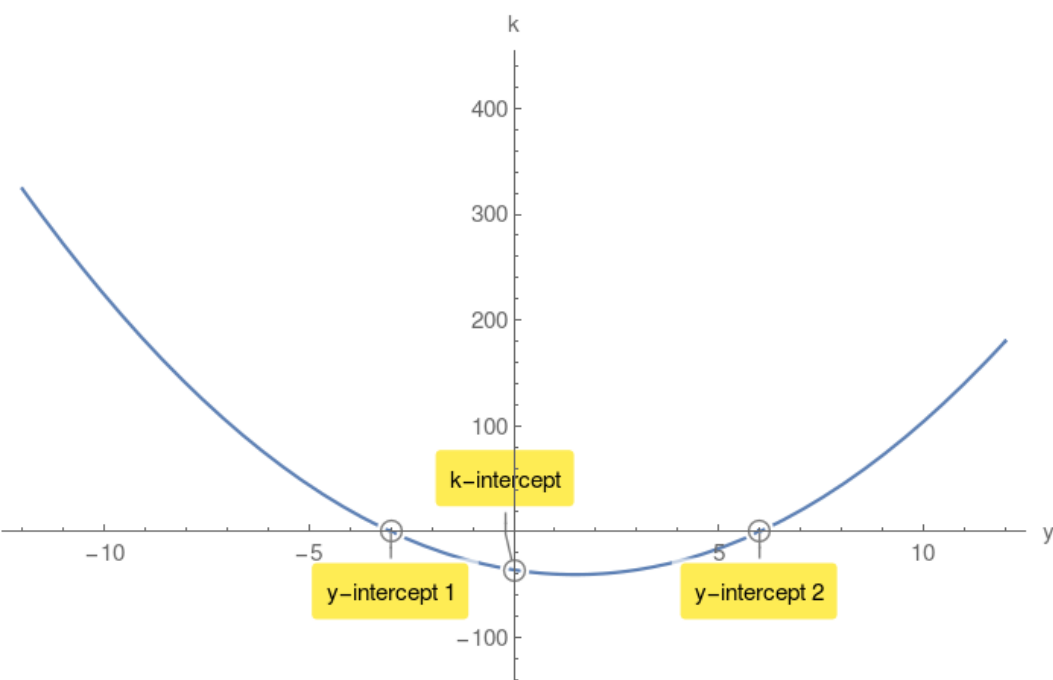
Example 1.

$k(y) = 2y^2 - 6y - 36$ compute its discriminant Δ :

$$\Delta = 324 > 0$$

$$y_{1,2} = -3, 6$$

$k(0) = -36$ k-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.

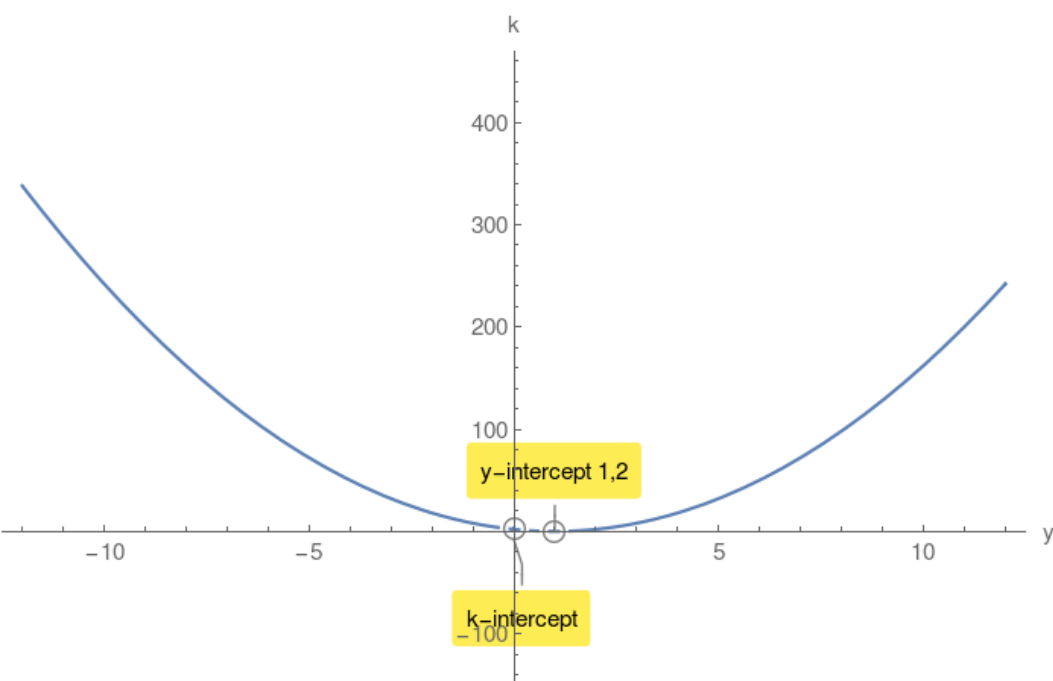
Example 2.

$k(y) = 2y^2 - 4y + 2$ compute its discriminant Δ :

$$\Delta = 0$$

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

$k(0) = 2$ k-intercept.



Case3: $\Delta < 0$

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

However there is a k-intercept.

Example 3.

$k(y) = -4y^2 + 56y - 245$ compute its discriminant Δ :

$$\Delta = -784 < 0$$

$k(0) = -245$ k-intercept.

