

Intercepts of the Quadratic

Given a quadratic $g(v) = av^2 + bv + c$ compute its discriminant Δ :

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

Case1: $\Delta > 0$

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

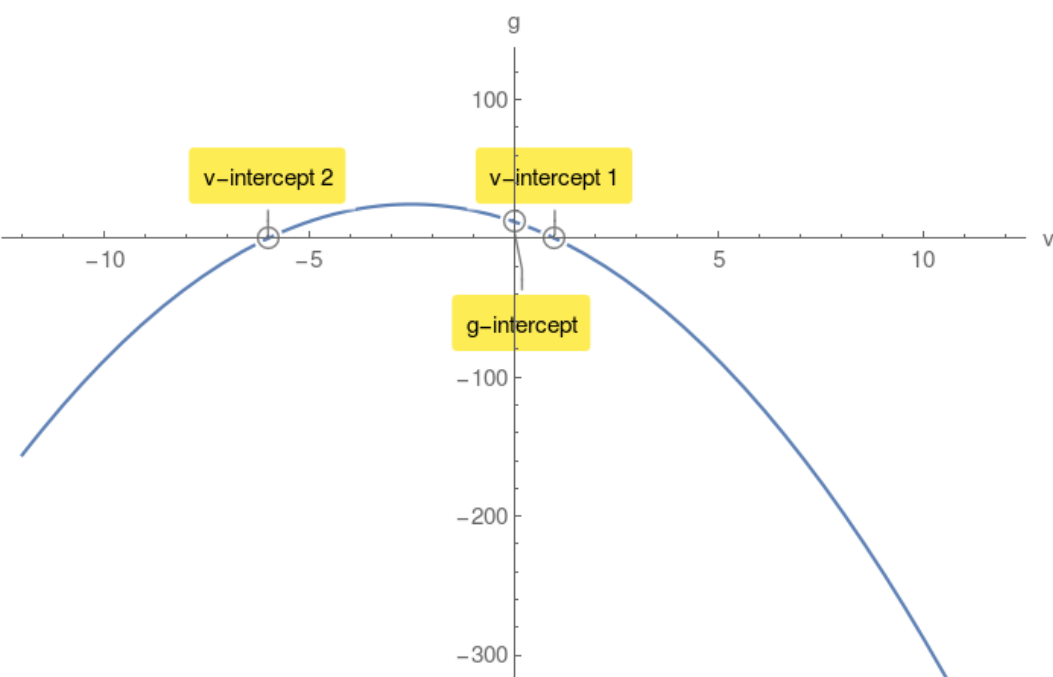
Example 1.

$g(v) = -2v^2 - 10v + 12$ compute its discriminant Δ :

$$\Delta = 196 > 0$$

$$v_{1,2} = 1, -6$$

$g(0) = 12$ g-intercept.



Case2: $\Delta = 0$

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

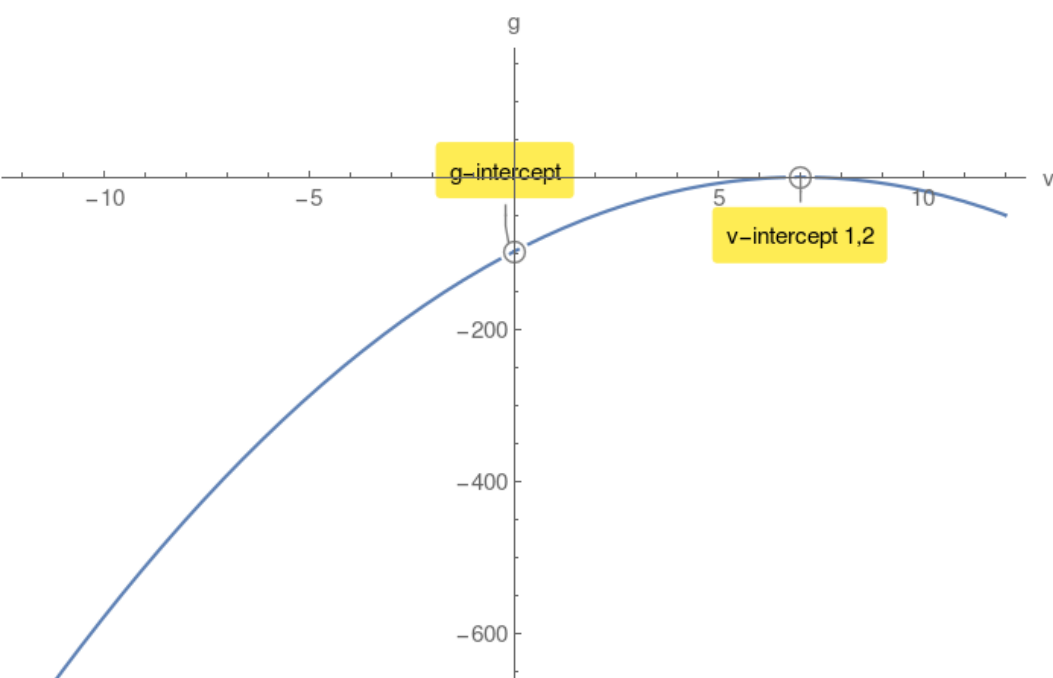
Example 2.

$g(v) = -2v^2 + 28v - 98$ compute its discriminant Δ :

$$\Delta = 0$$

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

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



Case3: $\Delta < 0$

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

However there is a g-intercept.

Example 3.

$g(v) = -9v^2 - 180v - 1000$ compute its discriminant Δ :

$$\Delta = -3600 < 0$$

$g(0) = -1000$ g-intercept.

