Intercepts of the Quadratic

Given a quadratic $y(g)=a\,g^2+b\,g+c$ compute its discriminant $\triangle$:

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

Case1: $\triangle>0$

$g_{1,2}=\frac{-b\pm\sqrt{b^2-4\,ac}}{2a}$ computes the g-intercepts of multiplicity 1.

$y(0)=c$ computes the single y-intercept.

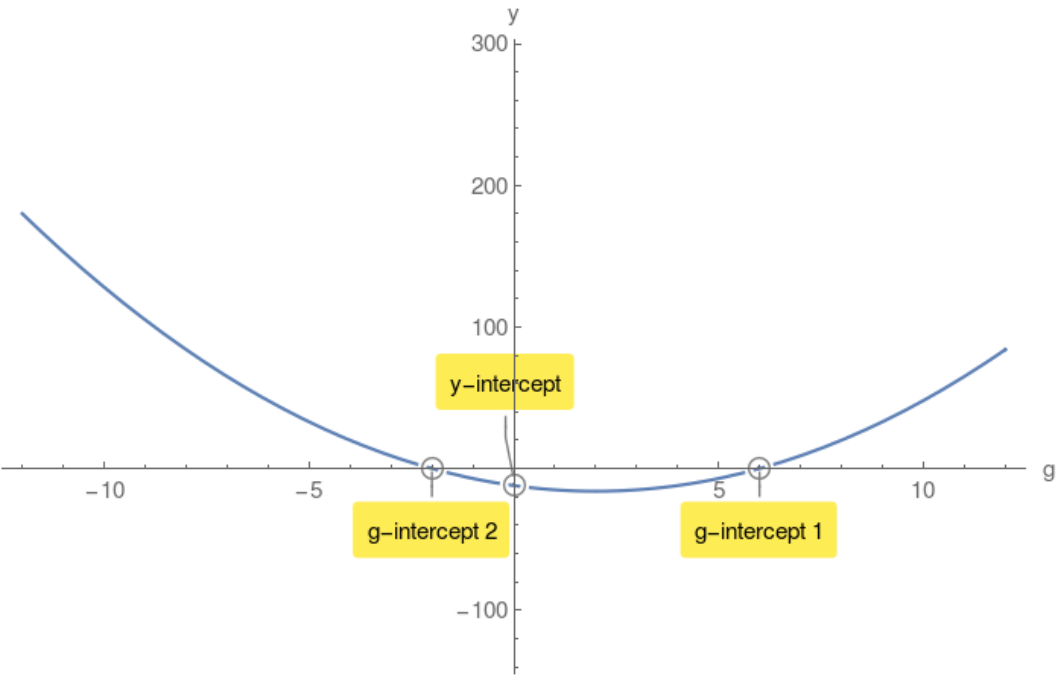
Example 1.

$y(g)=g^2-4\,g-12$ compute its discriminant $\triangle$:

$\triangle=64>0$

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

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



Case2: $\triangle=0$

$g_{1,2}=\frac{-b\pm\sqrt{b^2-4\,ac}}{2a}=\frac{-b\pm0}{2a}=\frac{-b}{2a}$ single g-intercept of multiplicity 2.

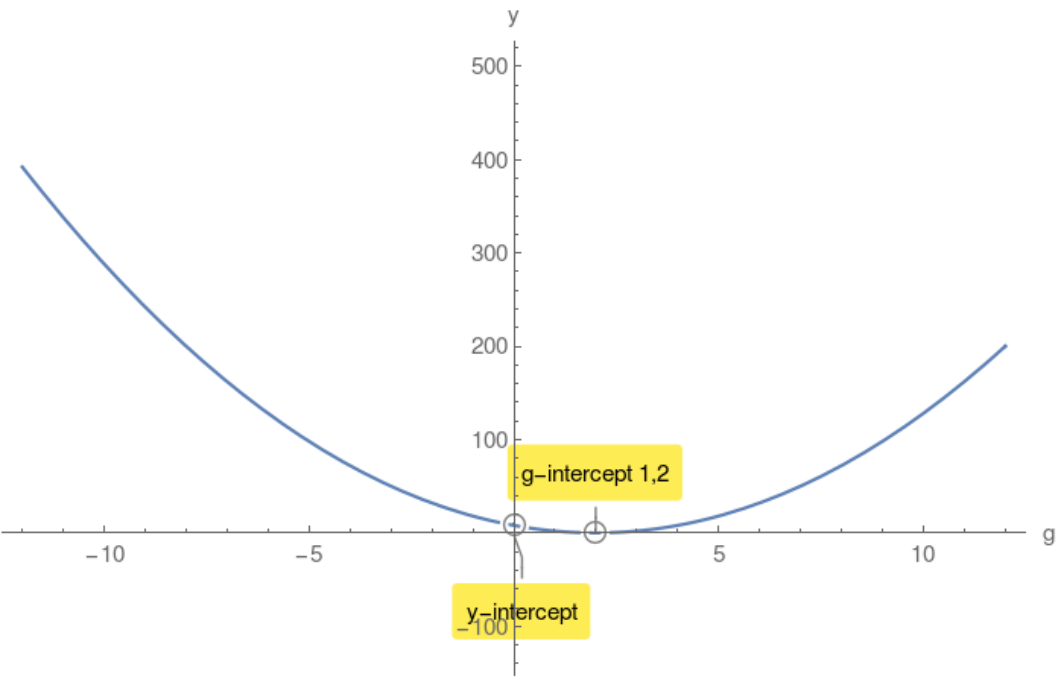
Example 2.

$y(g)=2\,g^2-8\,g+8$ compute its discriminant $\triangle$:

$\triangle=0$

$g_{1,2}=2,2$

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



Case3: $\triangle<0$

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

However there is a y-intercept.

Example 3.

$y(g)=-9\,g^2+144\,g-640$ compute its discriminant $\triangle$:

$\triangle=-2304<0$

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