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.

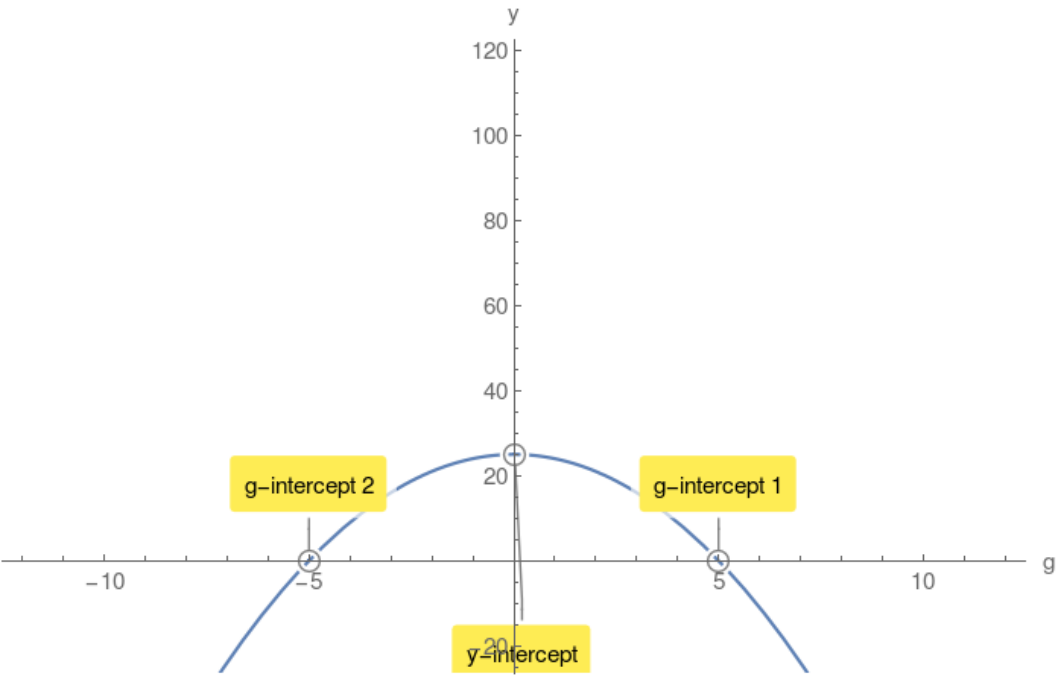
Example 1.

$y(g)=25-g^2$ compute its discriminant $\triangle$:

$\triangle=100>0$

$g_{1,2}=5,-5$

$y(0)=25$ 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.

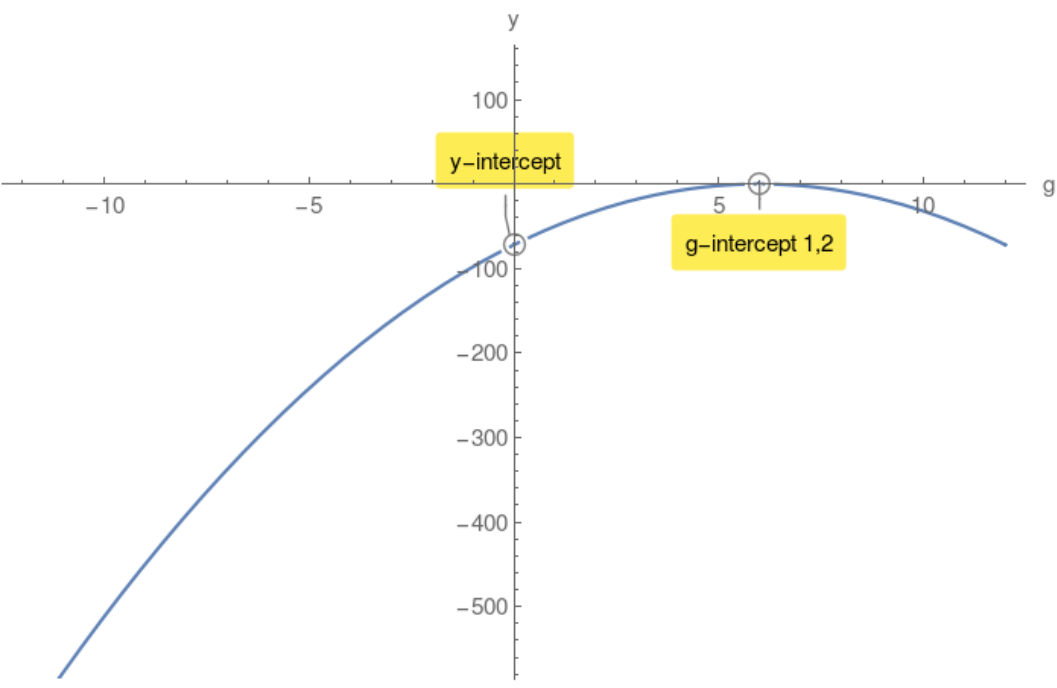
Example 2.

$y(g)=-2\,g^2+24\,g-72$ compute its discriminant $\triangle$:

$\triangle=0$

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

$y(0)=-72$ 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.

$y(g)=-4\,g^2+80\,g-500$ compute its discriminant $\triangle$:

$\triangle=-1600<0$

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