Intercepts of the Quadratic

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

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

Case1: $\triangle>0$

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

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

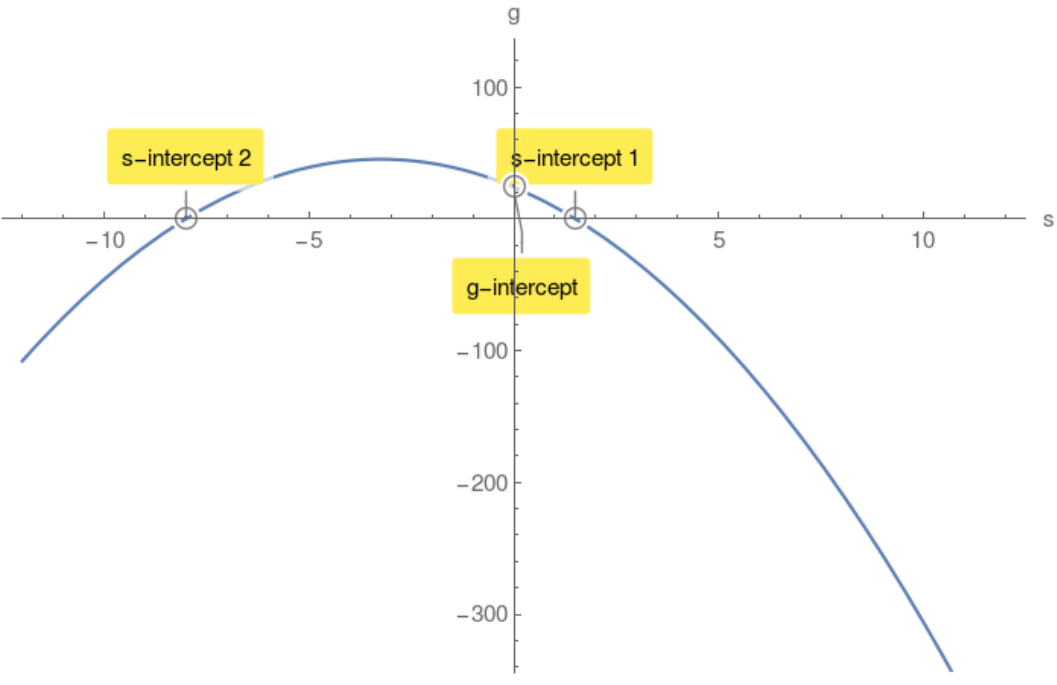
Example 1.

$g(s)=-2\,s^2-13\,s+24$ compute its discriminant $\triangle$:

$\triangle=361>0$

$s_{1,2}=\frac{3}{2},-8$

$g(0)=24$ g-intercept.



Case2: $\triangle=0$

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

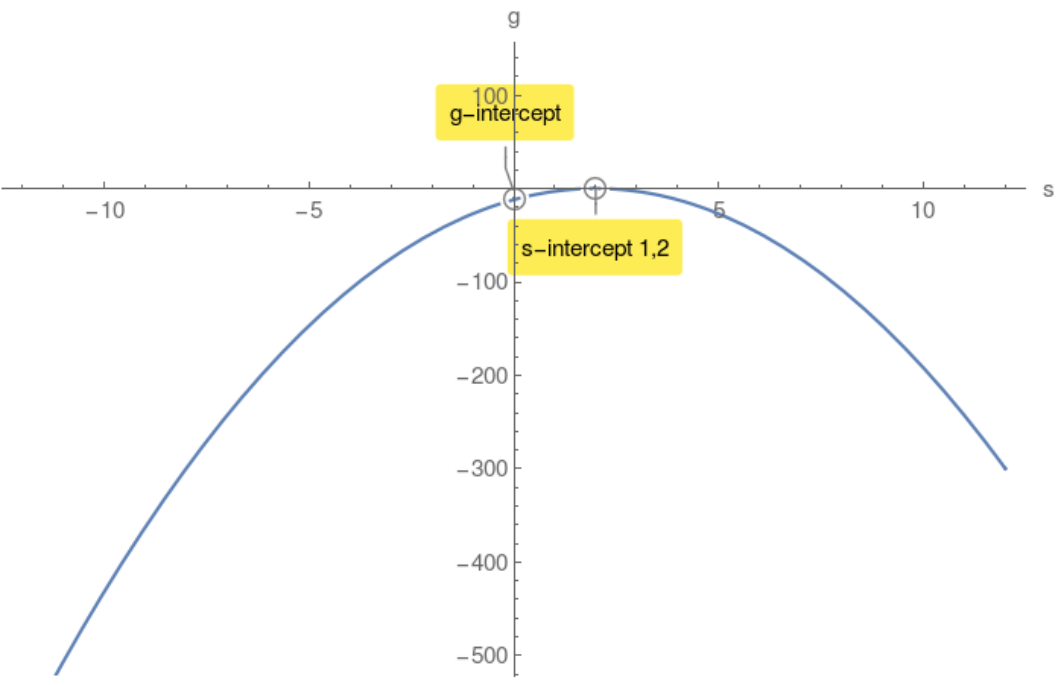
Example 2.

$g(s)=-3\,s^2+12\,s-12$ compute its discriminant $\triangle$:

$\triangle=0$

$s_{1,2}=2,2$

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



Case3: $\triangle<0$

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

However there is a g-intercept.

Example 3.

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

$\triangle=-1600<0$

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