Intercepts of the Quadratic

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

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

Case1: $\triangle>0$

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

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

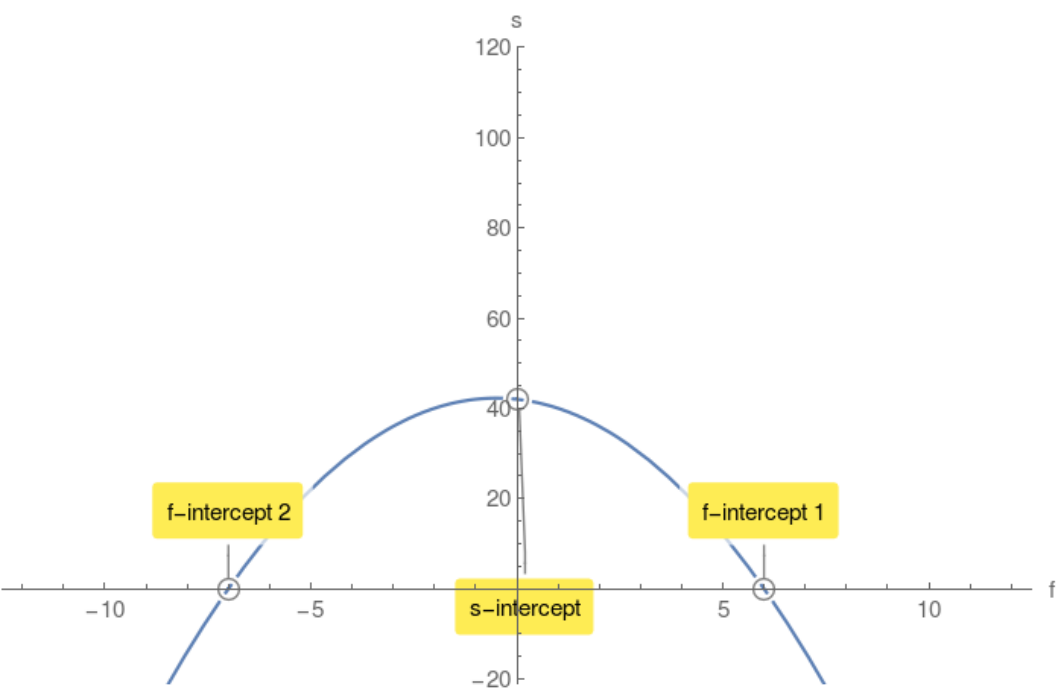
Example 1.

$s(f)=-f^2-f+42$ compute its discriminant $\triangle$:

$\triangle=169>0$

$f_{1,2}=6,-7$

$s(0)=42$ s-intercept.



Case2: $\triangle=0$

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

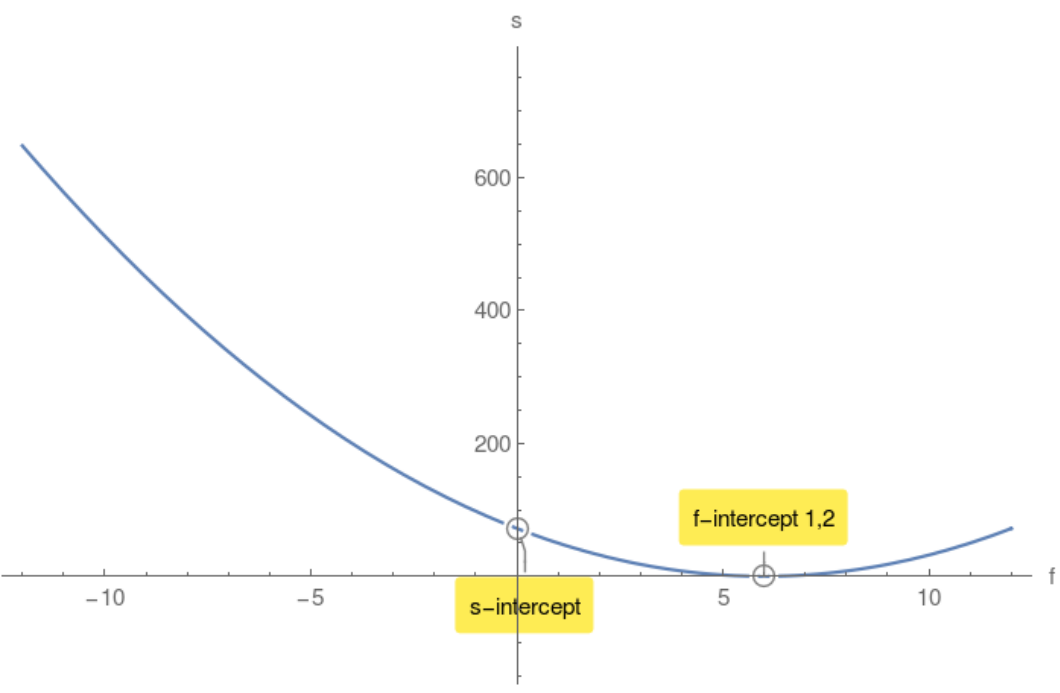
Example 2.

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

$\triangle=0$

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

$s(0)=72$ s-intercept.



Case3: $\triangle<0$

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

However there is a s-intercept.

Example 3.

$s(f)=9\,f^2-162\,f+810$ compute its discriminant $\triangle$:

$\triangle=-2916<0$

$s(0)=810$ s-intercept.