Intercepts of the Quadratic

Given a quadratic $p(f)=a\,f^2+b\,f+c$ 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.

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

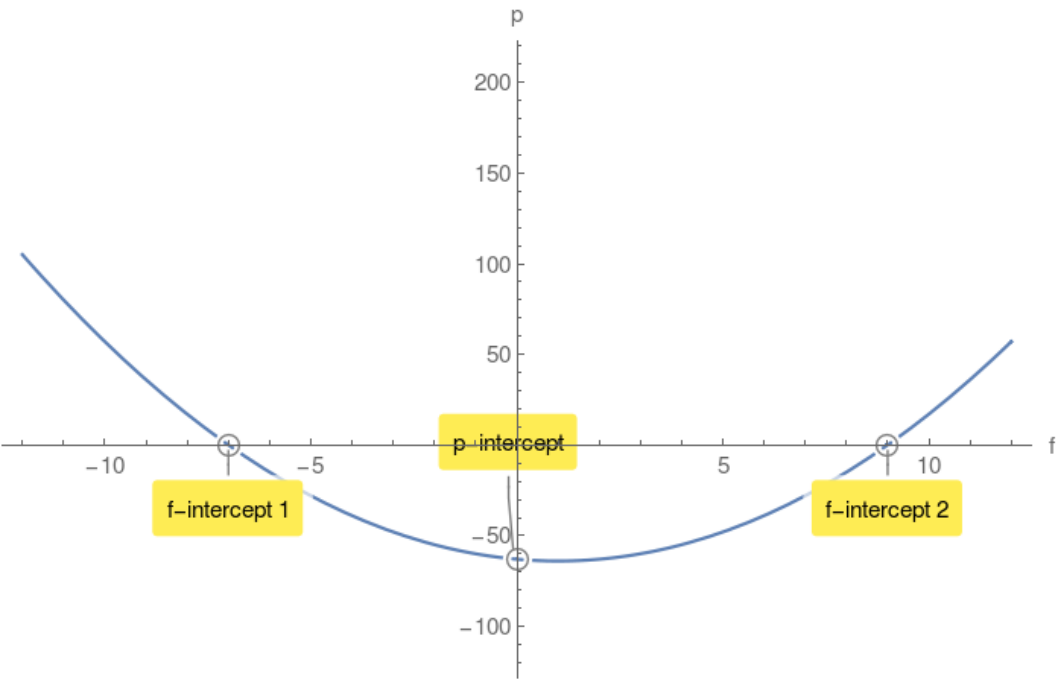
Example 1.

$p(f)=f^2-2\,f-63$ compute its discriminant $\triangle$:

$\triangle=256>0$

$f_{1,2}=-7,9$

$p(0)=-63$ p-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.

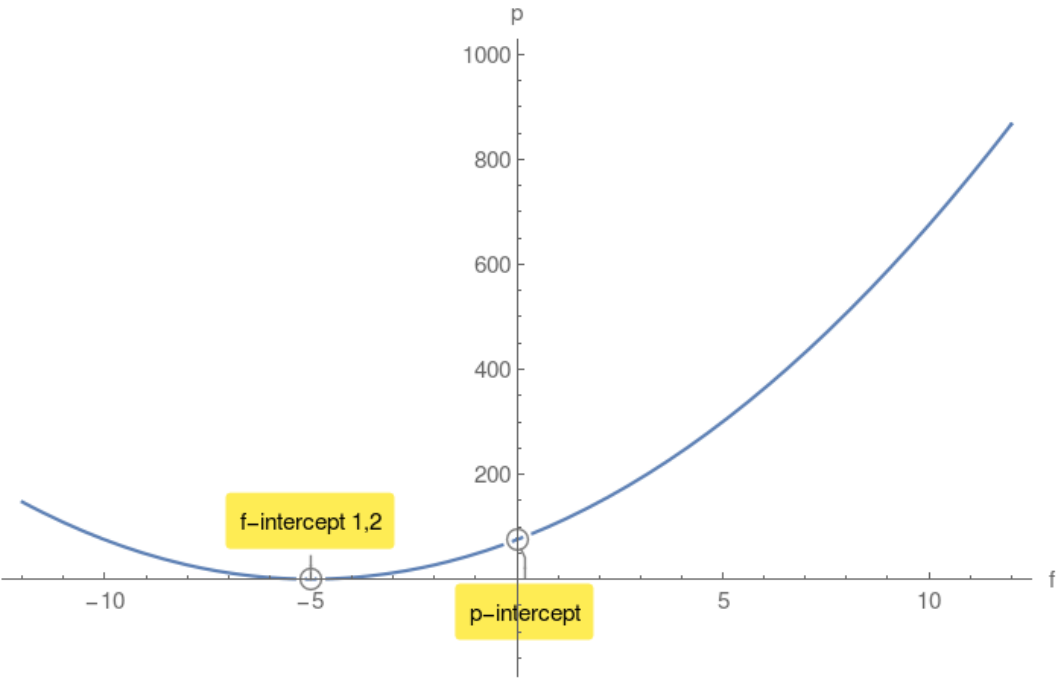
Example 2.

$p(f)=3\,f^2+30\,f+75$ compute its discriminant $\triangle$:

$\triangle=0$

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

$p(0)=75$ p-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 p-intercept.

Example 3.

$p(f)=4\,f^2+64\,f+320$ compute its discriminant $\triangle$:

$\triangle=-1024<0$

$p(0)=320$ p-intercept.