Intercepts of the Quadratic

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

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

Case1: $\triangle>0$

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

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

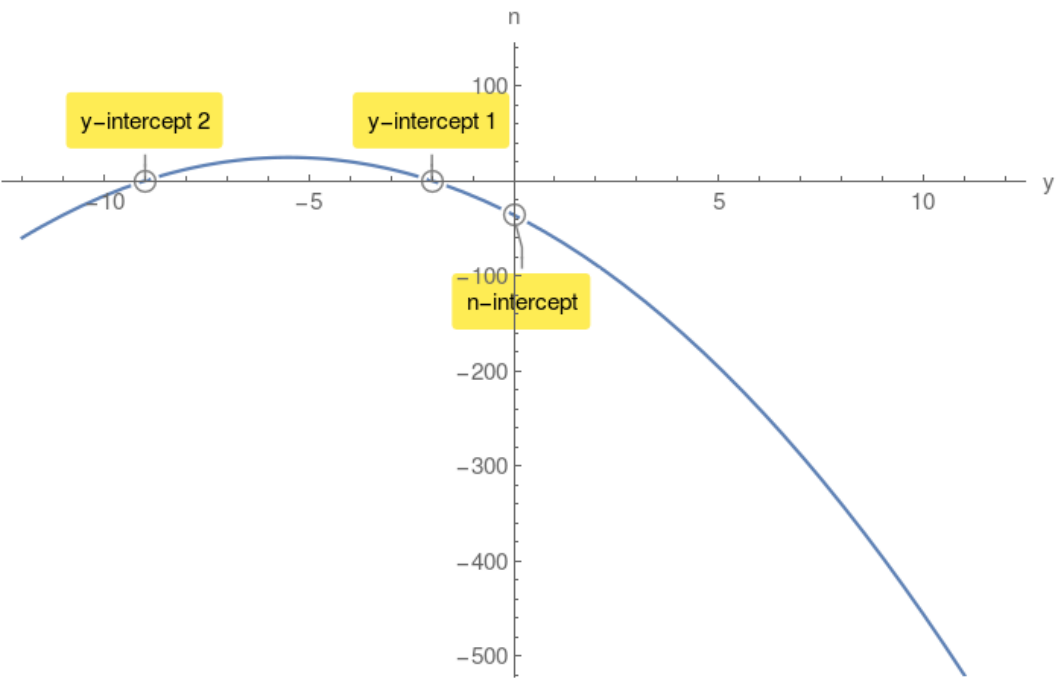
Example 1.

$n(y)=-2\,y^2-22\,y-36$ compute its discriminant $\triangle$:

$\triangle=196>0$

$y_{1,2}=-2,-9$

$n(0)=-36$ n-intercept.



Case2: $\triangle=0$

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

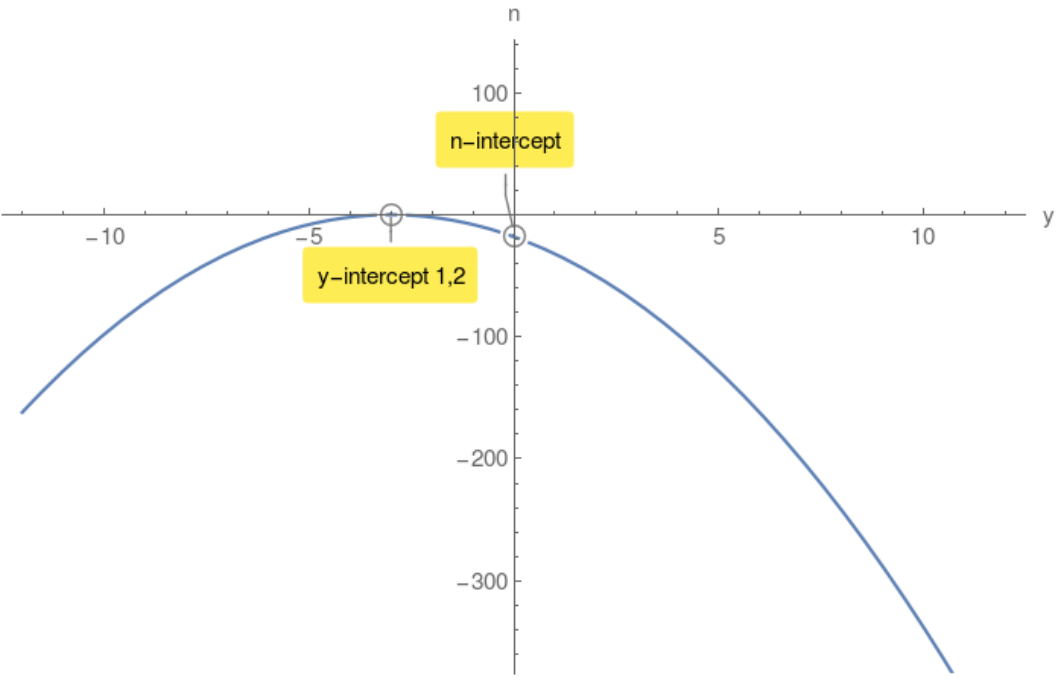
Example 2.

$n(y)=-2\,y^2-12\,y-18$ compute its discriminant $\triangle$:

$\triangle=0$

$y_{1,2}=-3,-3$

$n(0)=-18$ n-intercept.



Case3: $\triangle<0$

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

However there is a n-intercept.

Example 3.

$n(y)=9\,y^2-126\,y+490$ compute its discriminant $\triangle$:

$\triangle=-1764<0$

$n(0)=490$ n-intercept.