Intercepts of the Quadratic

Given a quadratic $u(y)=a\,y^2+b\,y+c$ 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.

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

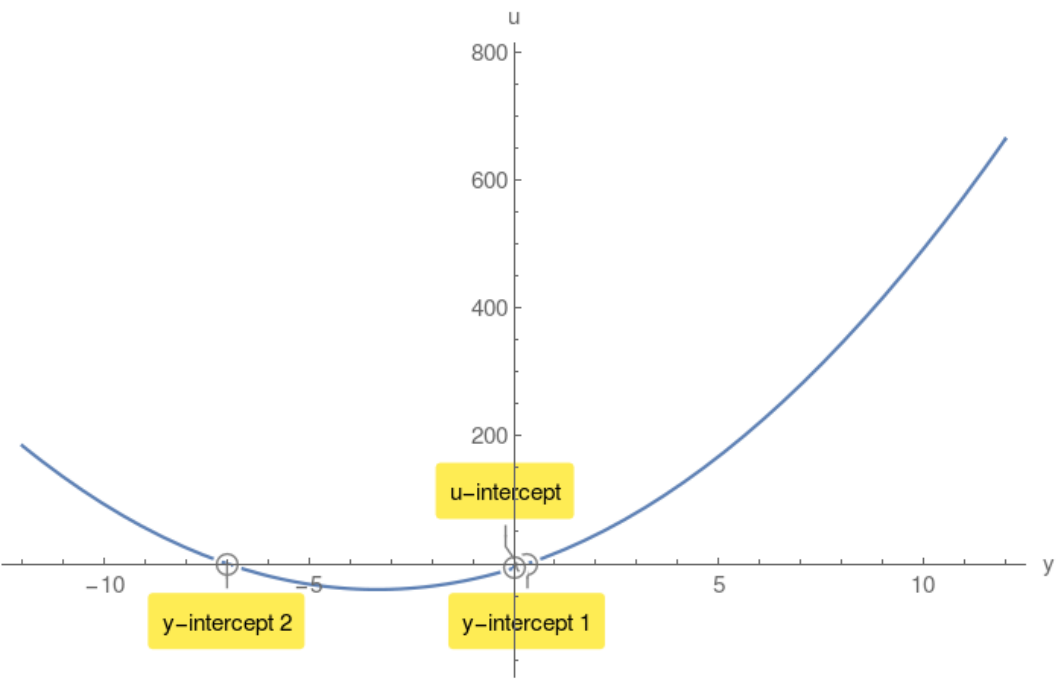
Example 1.

$u(y)=3\,y^2+20\,y-7$ compute its discriminant $\triangle$:

$\triangle=484>0$

$y_{1,2}=\frac{1}{3},-7$

$u(0)=-7$ u-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.

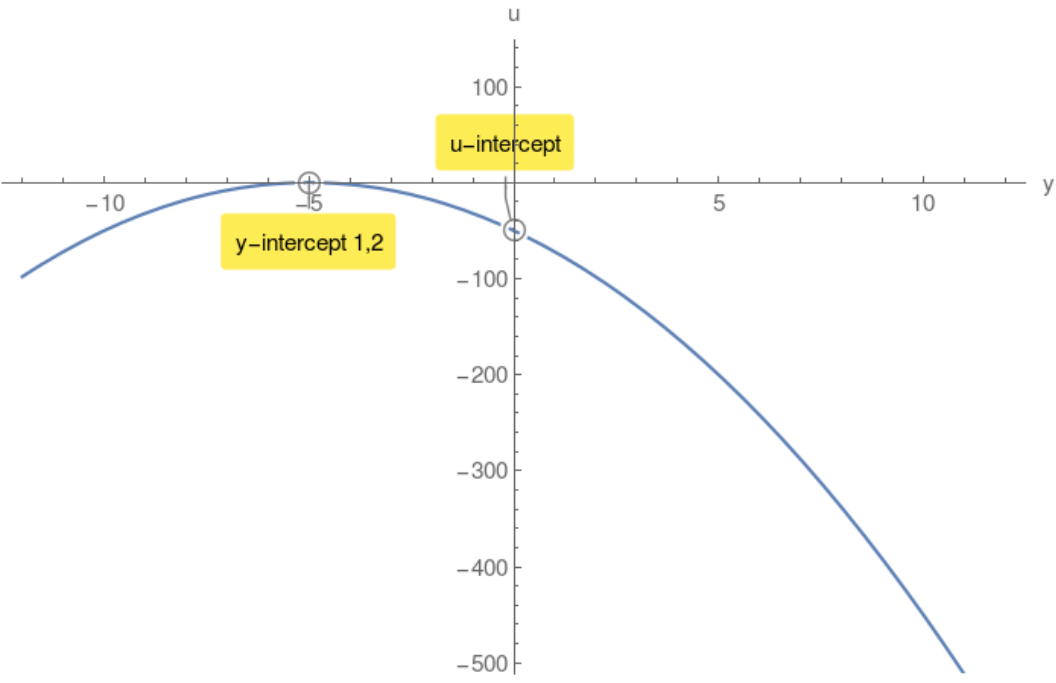
Example 2.

$u(y)=-2\,y^2-20\,y-50$ compute its discriminant $\triangle$:

$\triangle=0$

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

$u(0)=-50$ u-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 u-intercept.

Example 3.

$u(y)=4\,y^2+56\,y+245$ compute its discriminant $\triangle$:

$\triangle=-784<0$

$u(0)=245$ u-intercept.