Intercepts of the Quadratic

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

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

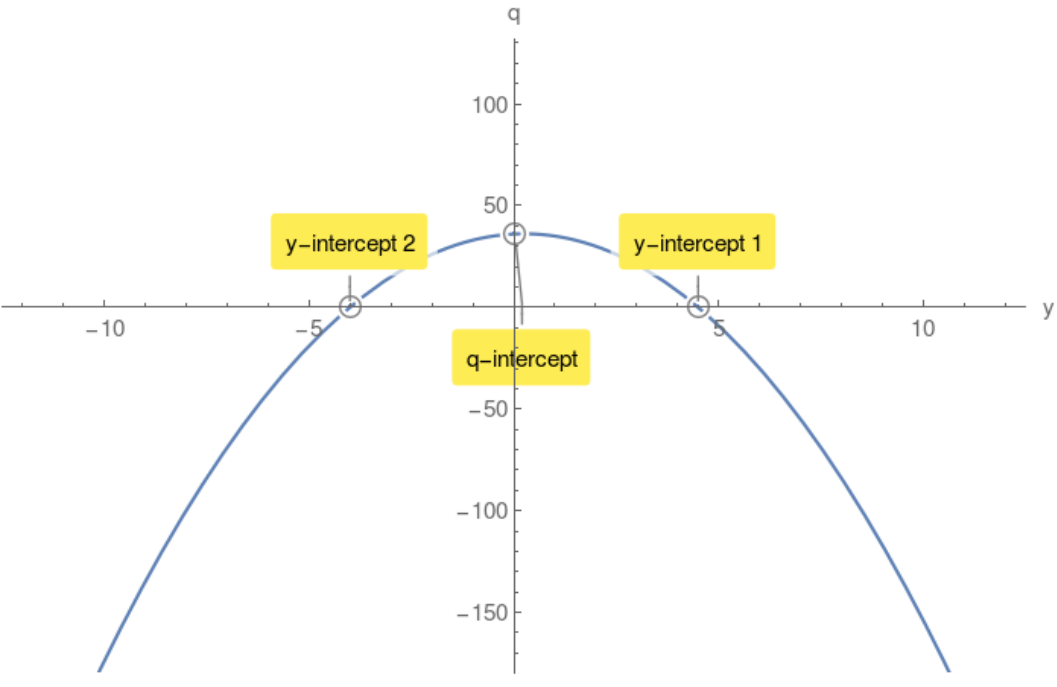
Example 1.

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

$\triangle=289>0$

$y_{1,2}=\frac{9}{2},-4$

$q(0)=36$ q-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.

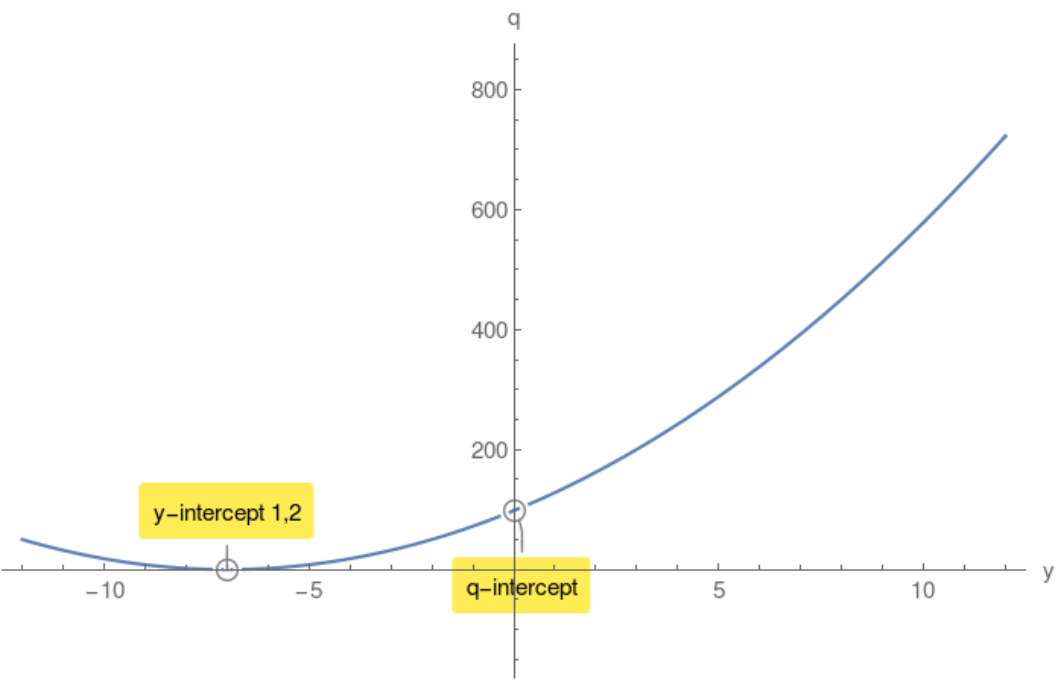
Example 2.

$q(y)=2\,y^2+28\,y+98$ compute its discriminant $\triangle$:

$\triangle=0$

$y_{1,2}=-7,-7$

$q(0)=98$ q-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 q-intercept.

Example 3.

$q(y)=-4\,y^2-64\,y-320$ compute its discriminant $\triangle$:

$\triangle=-1024<0$

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