Intercepts of the Quadratic

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

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

Case1: $\triangle>0$

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

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

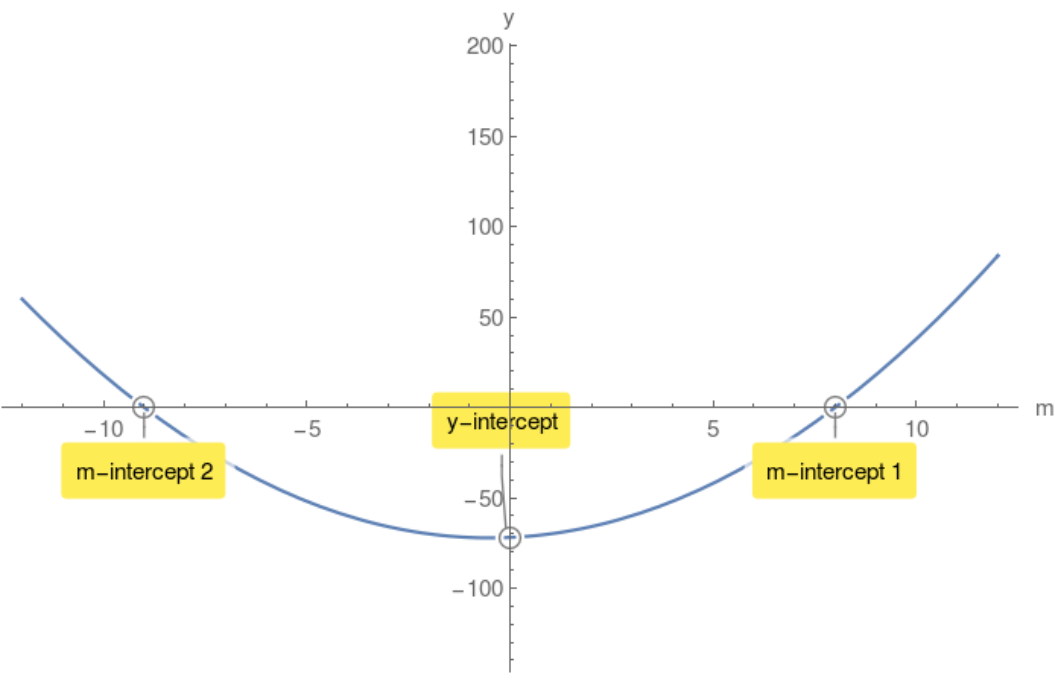
Example 1.

$y(m)=m^2+m-72$ compute its discriminant $\triangle$:

$\triangle=289>0$

$m_{1,2}=8,-9$

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



Case2: $\triangle=0$

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

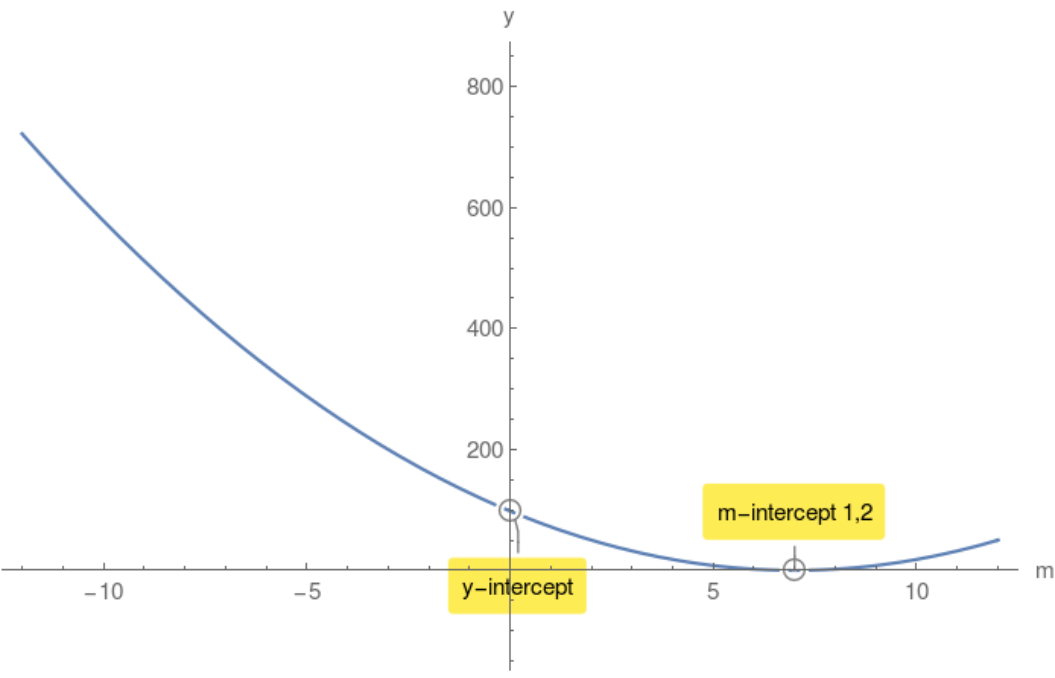
Example 2.

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

$\triangle=0$

$m_{1,2}=7,7$

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



Case3: $\triangle<0$

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

However there is a y-intercept.

Example 3.

$y(m)=9\,m^2+180\,m+1000$ compute its discriminant $\triangle$:

$\triangle=-3600<0$

$y(0)=1000$ y-intercept.