Intercepts of the Quadratic

Given a quadratic $k(m)=a\,m^2+b\,m+c$ 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.

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

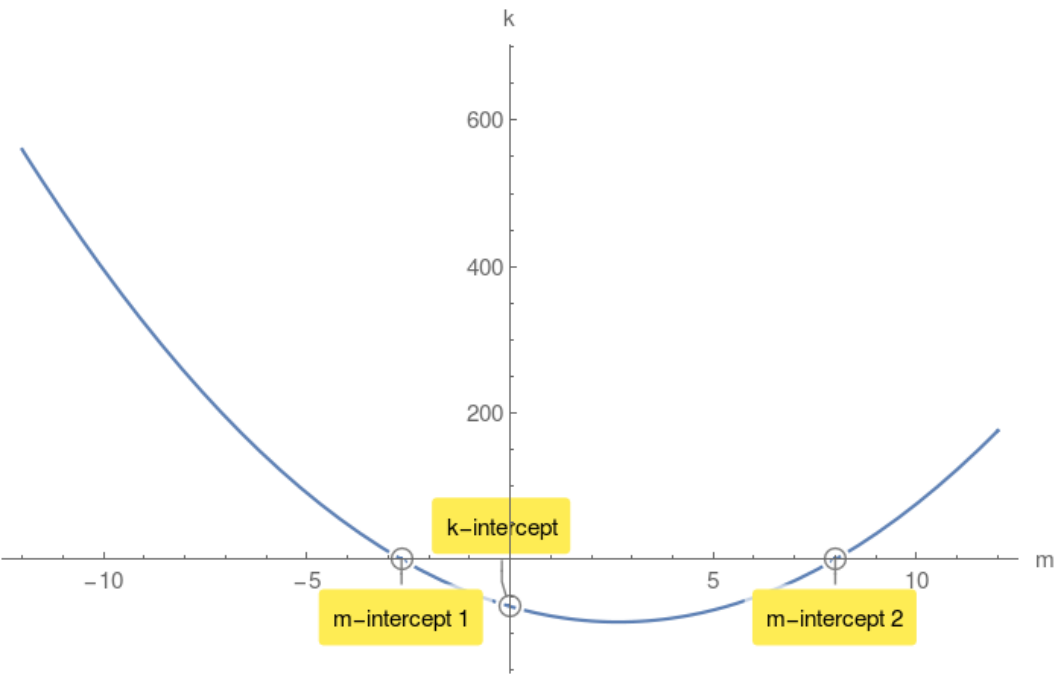
Example 1.

$k(m)=3\,m^2-16\,m-64$ compute its discriminant $\triangle$:

$\triangle=1024>0$

$m_{1,2}=-\frac{8}{3},8$

$k(0)=-64$ k-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.

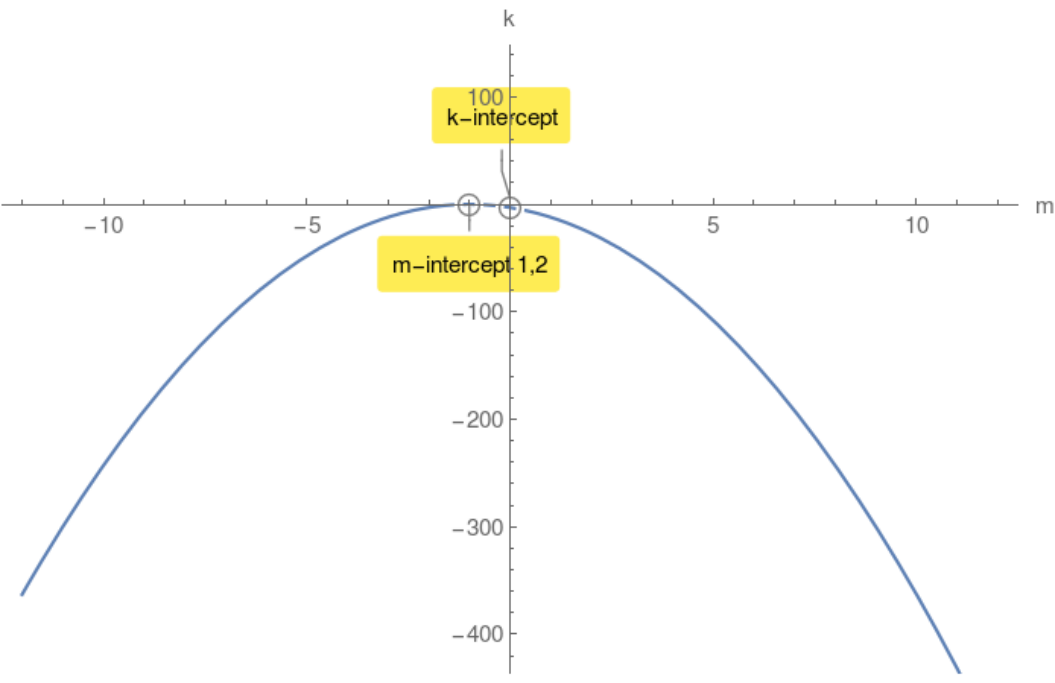
Example 2.

$k(m)=-3\,m^2-6\,m-3$ compute its discriminant $\triangle$:

$\triangle=0$

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

$k(0)=-3$ k-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 k-intercept.

Example 3.

$k(m)=4\,m^2+80\,m+500$ compute its discriminant $\triangle$:

$\triangle=-1600<0$

$k(0)=500$ k-intercept.