Intercepts of the Quadratic

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

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

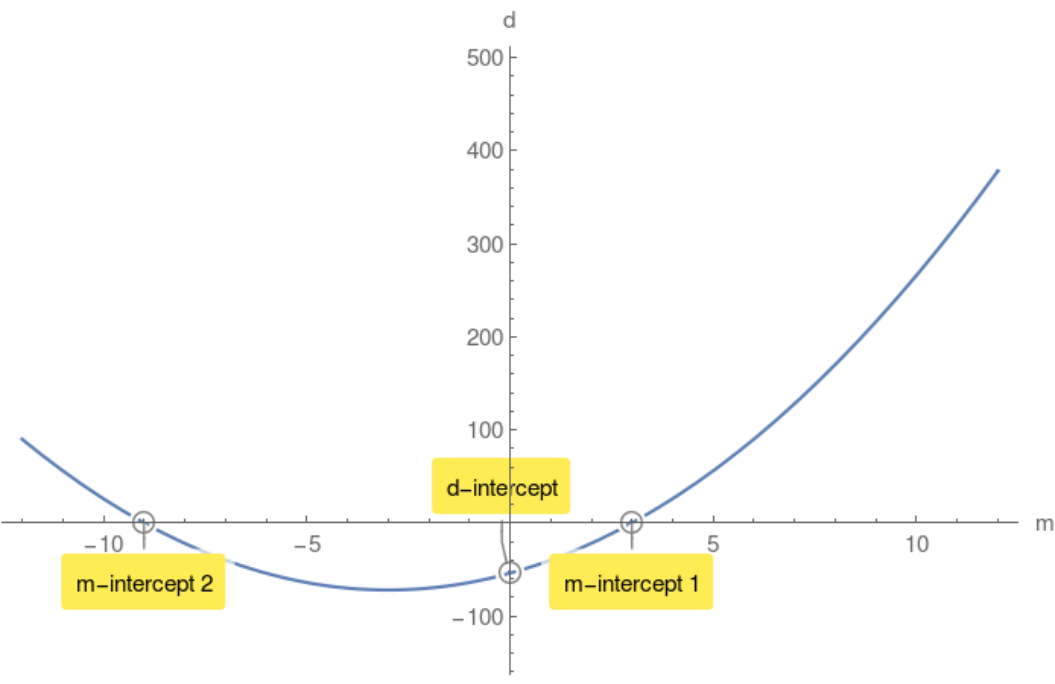
Example 1.

$d(m)=2\,m^2+12\,m-54$ compute its discriminant $\triangle$:

$\triangle=576>0$

$m_{1,2}=3,-9$

$d(0)=-54$ d-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.

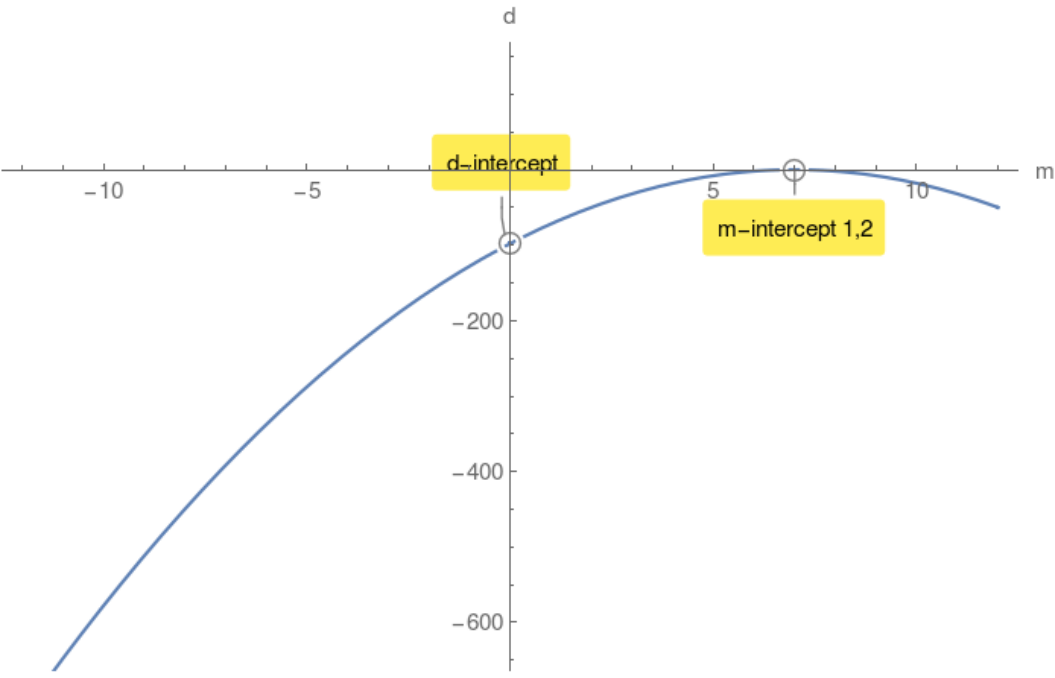
Example 2.

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

$\triangle=0$

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

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

Example 3.

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

$\triangle=-1764<0$

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