Intercepts of the Quadratic

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

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

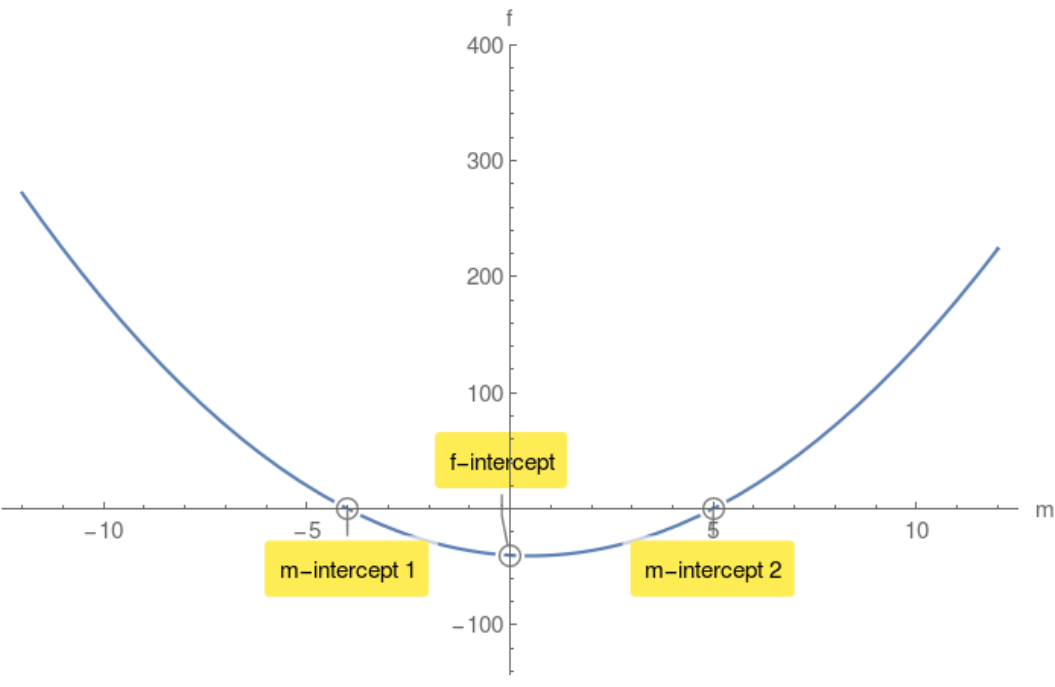
Example 1.

$f(m)=2\,m^2-2\,m-40$ compute its discriminant $\triangle$:

$\triangle=324>0$

$m_{1,2}=-4,5$

$f(0)=-40$ f-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.

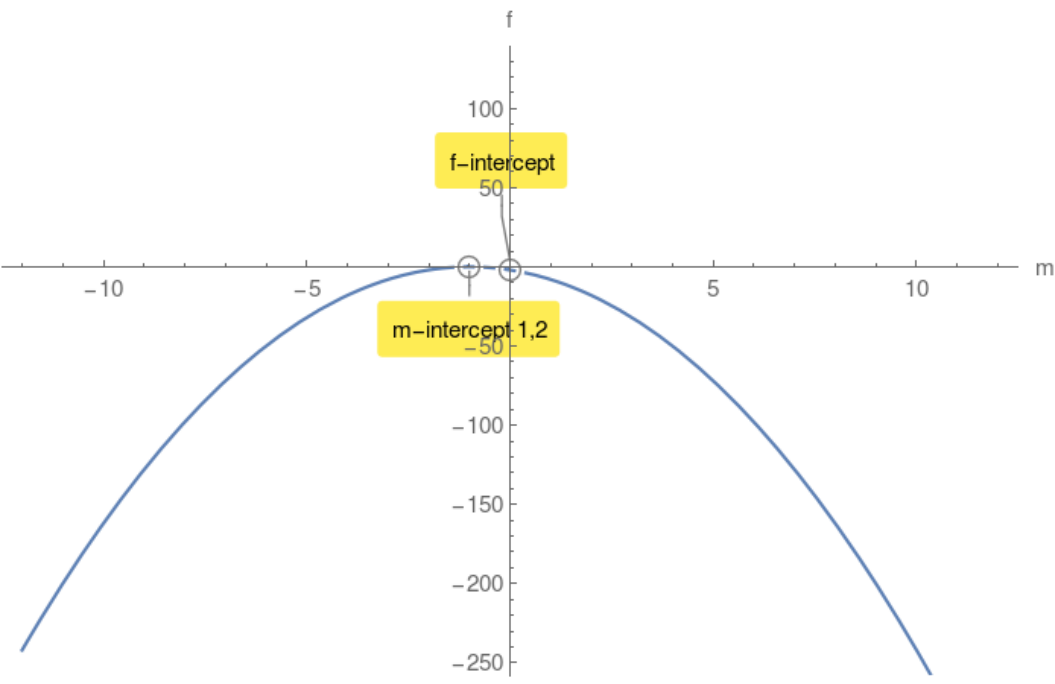
Example 2.

$f(m)=-2\,m^2-4\,m-2$ compute its discriminant $\triangle$:

$\triangle=0$

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

$f(0)=-2$ f-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 f-intercept.

Example 3.

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

$\triangle=-784<0$

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