Intercepts of the Quadratic

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

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

Case1: $\triangle>0$

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

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

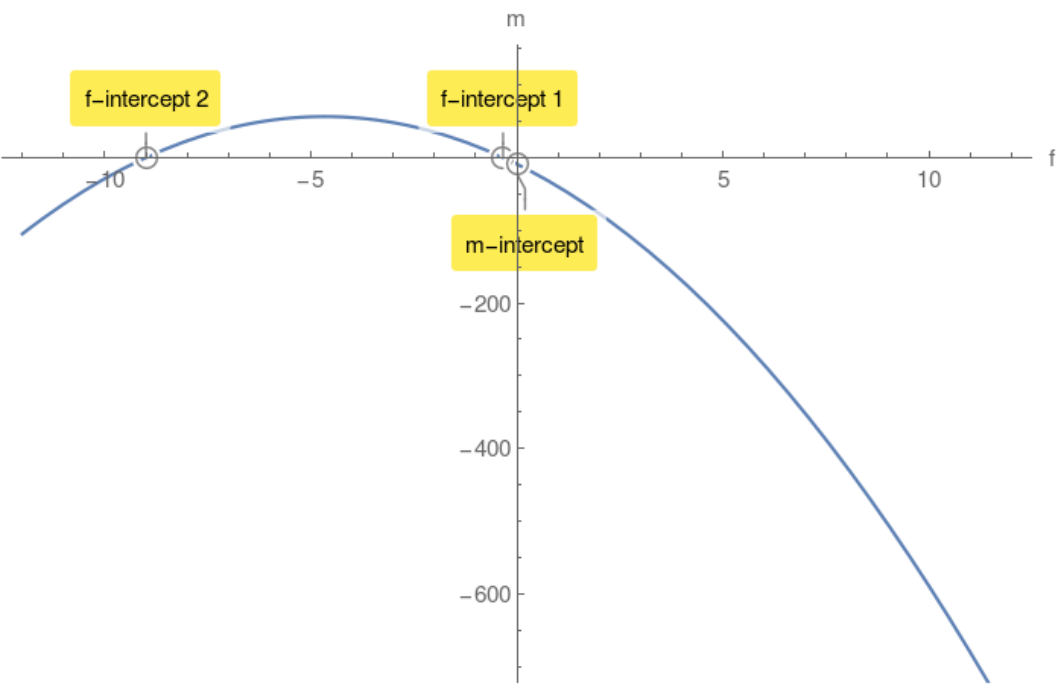
Example 1.

$m(f)=-3\,f^2-28\,f-9$ compute its discriminant $\triangle$:

$\triangle=676>0$

$f_{1,2}=-\frac{1}{3},-9$

$m(0)=-9$ m-intercept.



Case2: $\triangle=0$

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

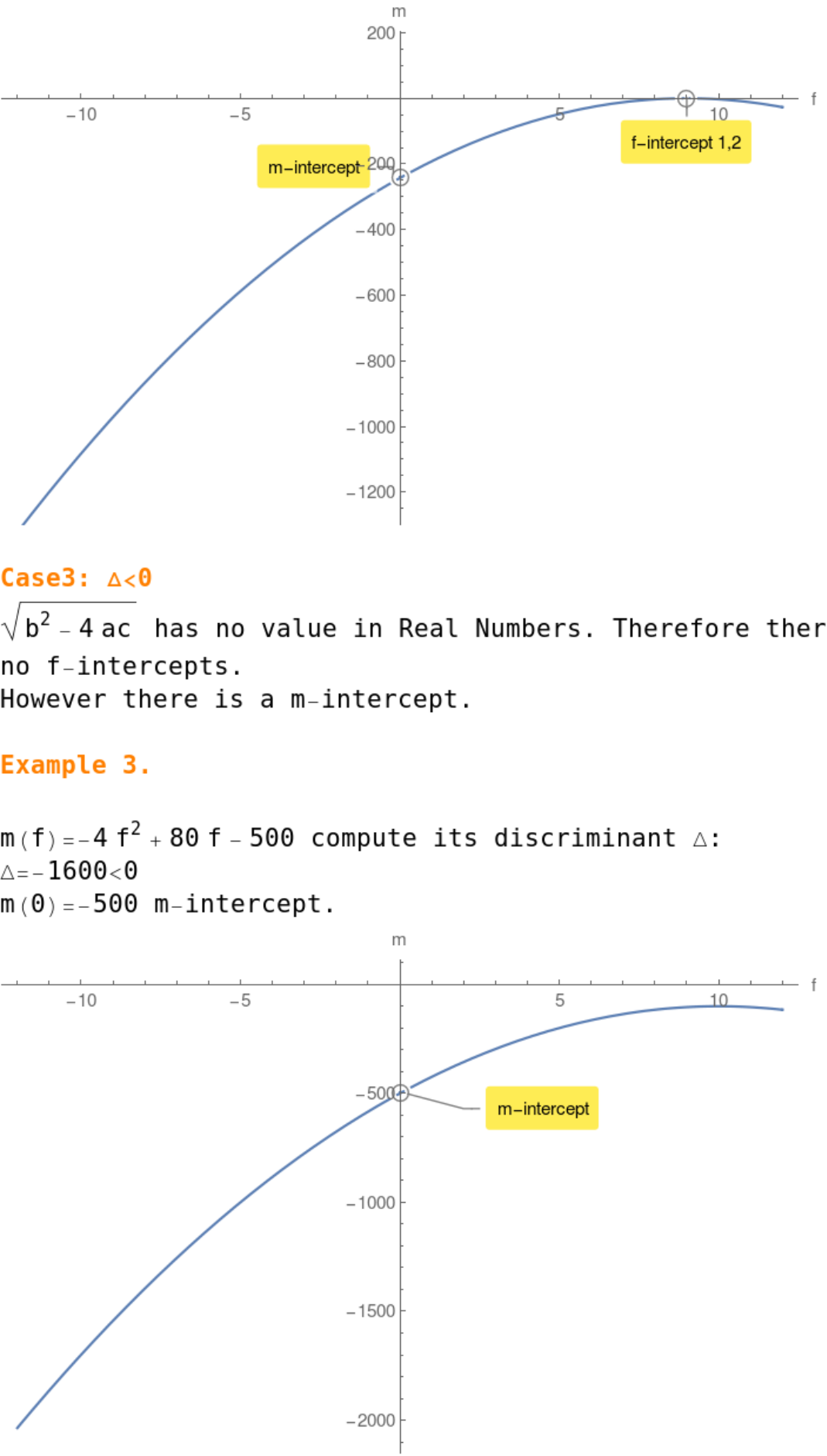
Example 2.

$m(f)=-3\,f^2+54\,f-243$ compute its discriminant $\triangle$:

$\triangle=0$

$f_{1,2}=9,9$

$m(0)=-243$ m-intercept.



Case3: $\triangle<0$

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

However there is a m-intercept.

Example 3.

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

$\triangle=-1600<0$

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