# Intercepts of the Quadratic

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

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

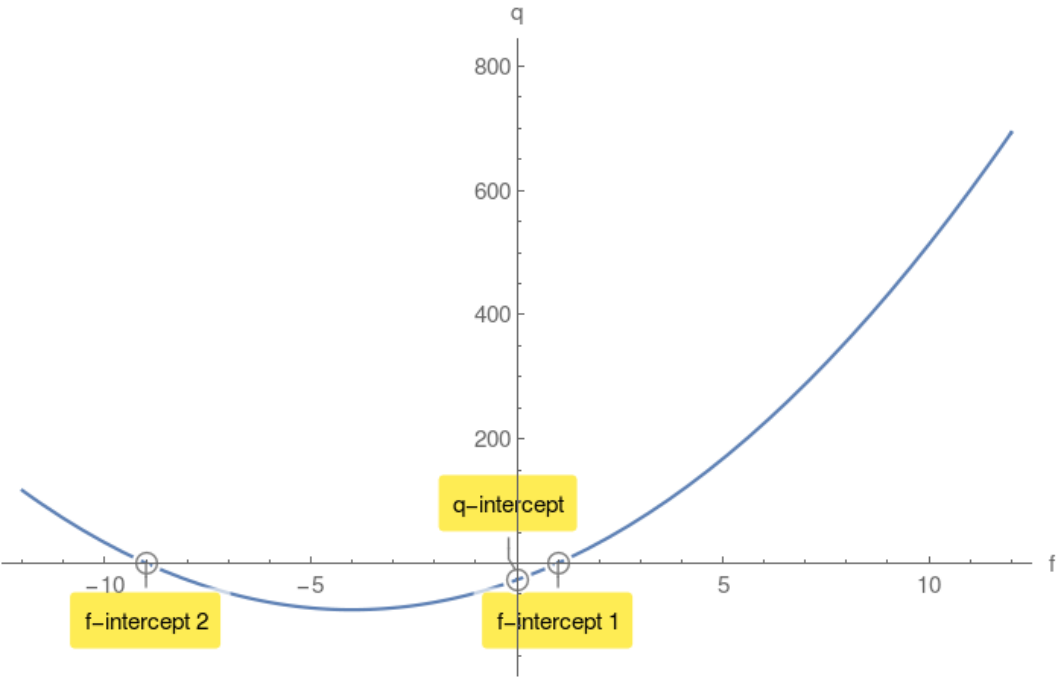
## Example 1.

$q(f)=3\,f^2+24\,f-27$ compute its discriminant $\triangle$:

$\triangle=900>0$

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

$q(0)=-27$ q-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.

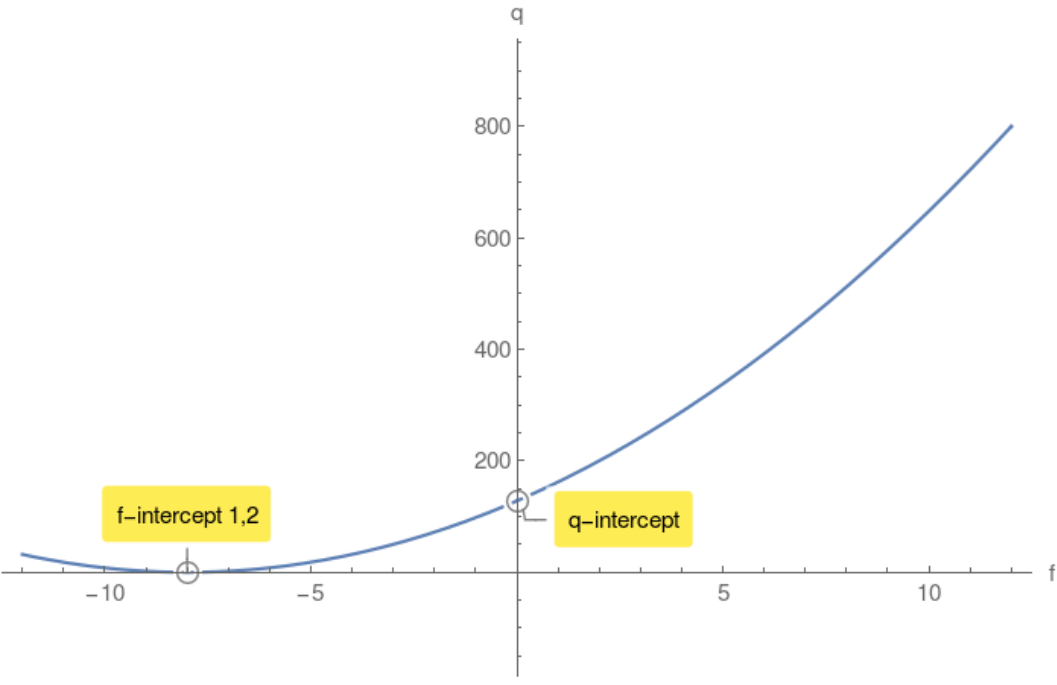
## Example 2.

$q(f)=2\,f^2+32\,f+128$ compute its discriminant $\triangle$:

$\triangle=0$

$f_{1,2}=-8,-8$

$q(0)=128$ q-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 q-intercept.

## Example 3.

$q(f)=-9\,f^2-126\,f-490$ compute its discriminant $\triangle$:

$\triangle=-1764<0$

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