# Intercepts of the Quadratic

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

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

## Case1: $\triangle>0$

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

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

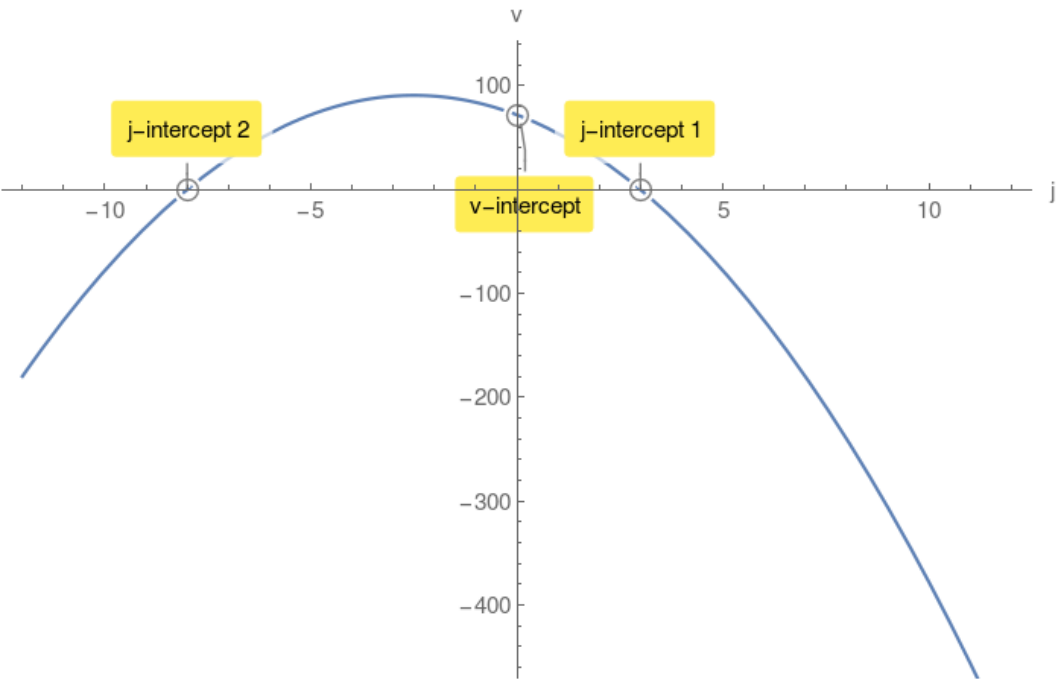
## Example 1.

$v(j)=-3\,j^2-15\,j+72$ compute its discriminant $\triangle$:

$\triangle=1089>0$

$j_{1,2}=3,-8$

$v(0)=72$ v-intercept.




## Case2: $\triangle=0$

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

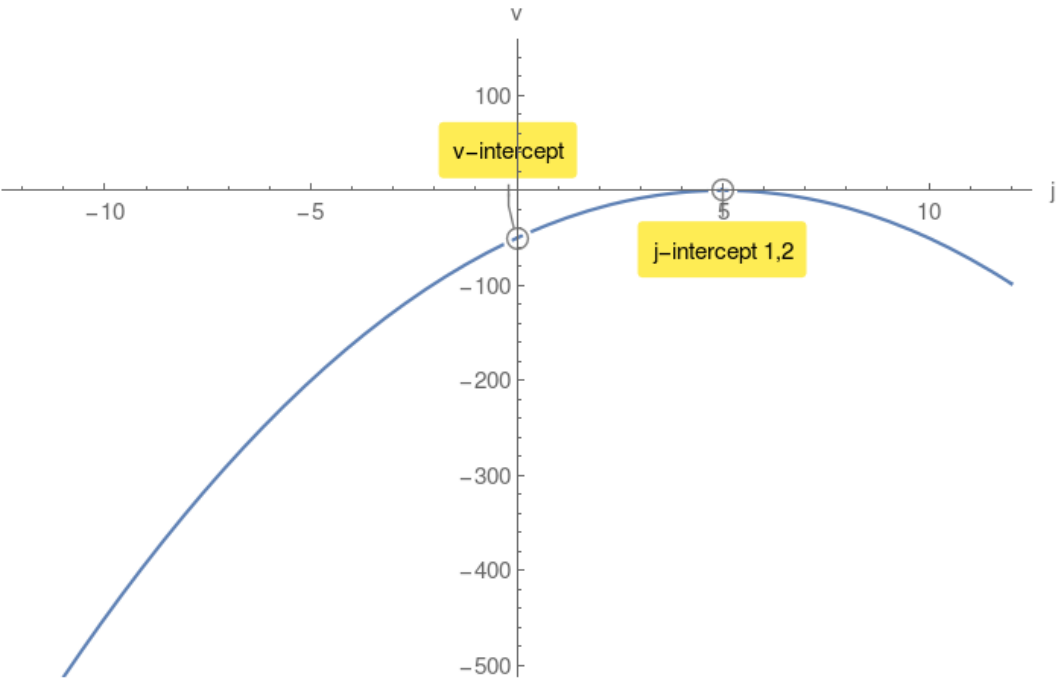
## Example 2.

$v(j)=-2\,j^2+20\,j-50$ compute its discriminant $\triangle$:

$\triangle=0$

$j_{1,2}=5,5$

$v(0)=-50$ v-intercept.




## Case3: $\triangle<0$

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

However there is a v-intercept.

## Example 3.

$v(j)=-4\,j^2-56\,j-245$ compute its discriminant $\triangle$:

$\triangle=-784<0$

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