# Intercepts of the Quadratic

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

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

## Case1: $\triangle>0$

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

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

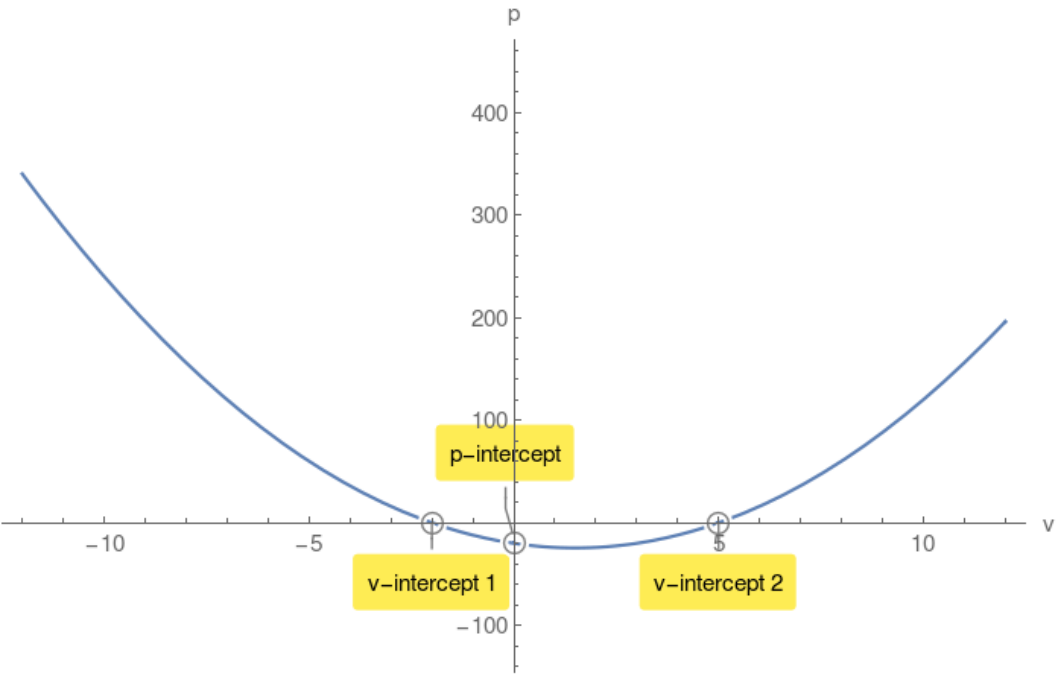
## Example 1.

$p(v)=2\,v^2-6\,v-20$ compute its discriminant $\triangle$:

$\triangle=196>0$

$v_{1,2}=-2,5$

$p(0)=-20$ p-intercept.




## Case2: $\triangle=0$

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

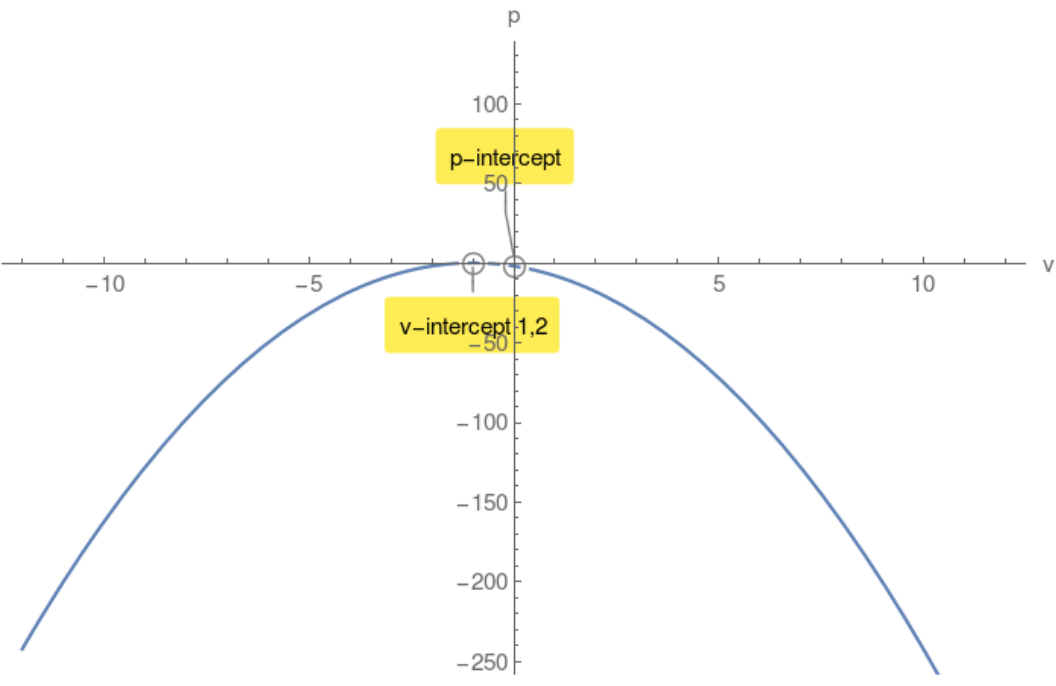
## Example 2.

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

$\triangle=0$

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

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




## Case3: $\triangle<0$

$\sqrt{b^2-4\,ac}$ has no value in Real Numbers. Therefore there are no v-intercepts.
However there is a p-intercept.

## Example 3.

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

$\triangle=-1600<0$

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