Intercepts of the Quadratic

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

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

Case1: $\triangle>0$

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

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

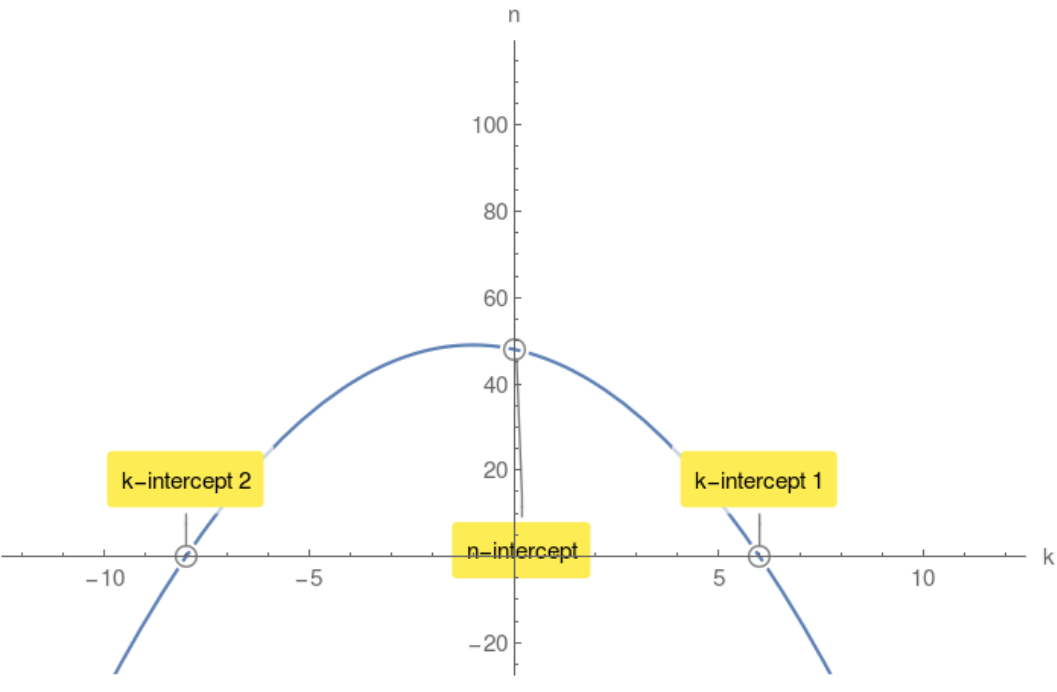
Example 1.

$n(k)=-k^2-2\,k+48$ compute its discriminant $\triangle$:

$\triangle=196>0$

$k_{1,2}=6,-8$

$n(0)=48$ n-intercept.



Case2: $\triangle=0$

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

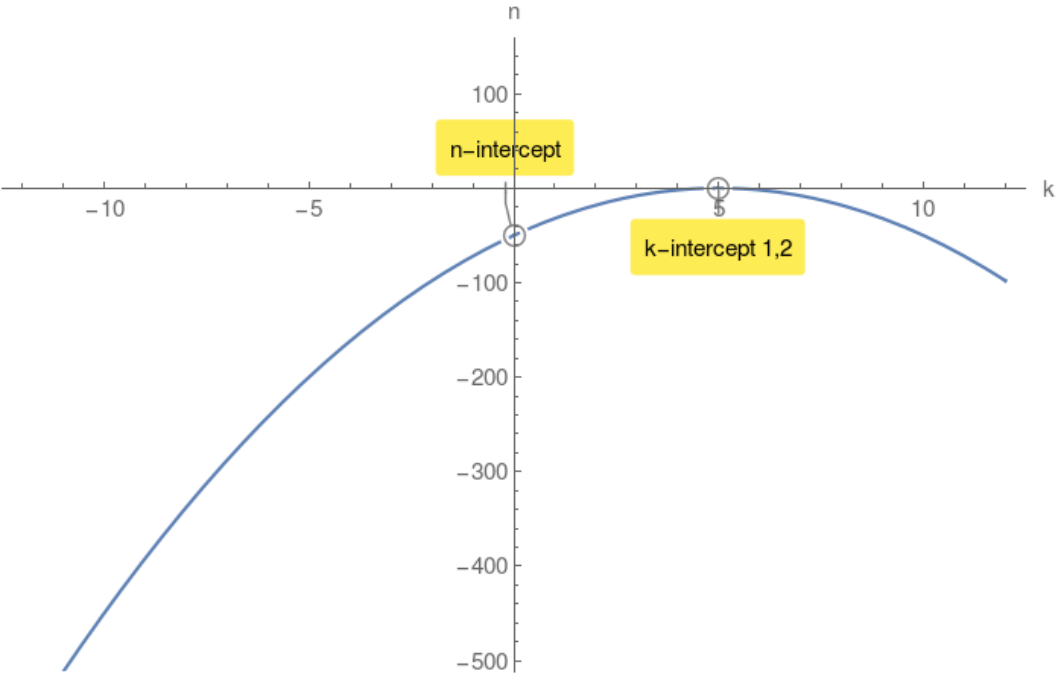
Example 2.

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

$\triangle=0$

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

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



Case3: $\triangle<0$

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

However there is a n-intercept.

Example 3.

$n(k)=-9\,k^2+180\,k-1000$ compute its discriminant $\triangle$:

$\triangle=-3600<0$

$n(0)=-1000$ n-intercept.