Intercepts of the Quadratic

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

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

Case1: $\triangle>0$

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

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

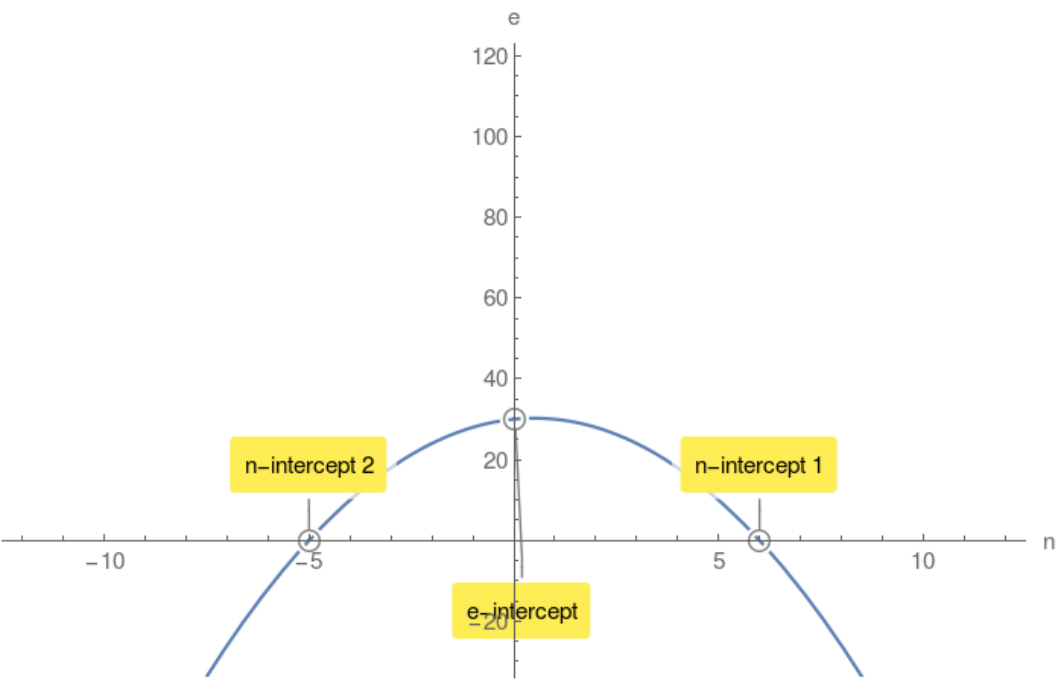
Example 1.

$e(n)=-n^2+n+30$ compute its discriminant $\triangle$:

$\triangle=121>0$

$n_{1,2}=6,-5$

$e(0)=30$ e-intercept.



Case2: $\triangle=0$

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

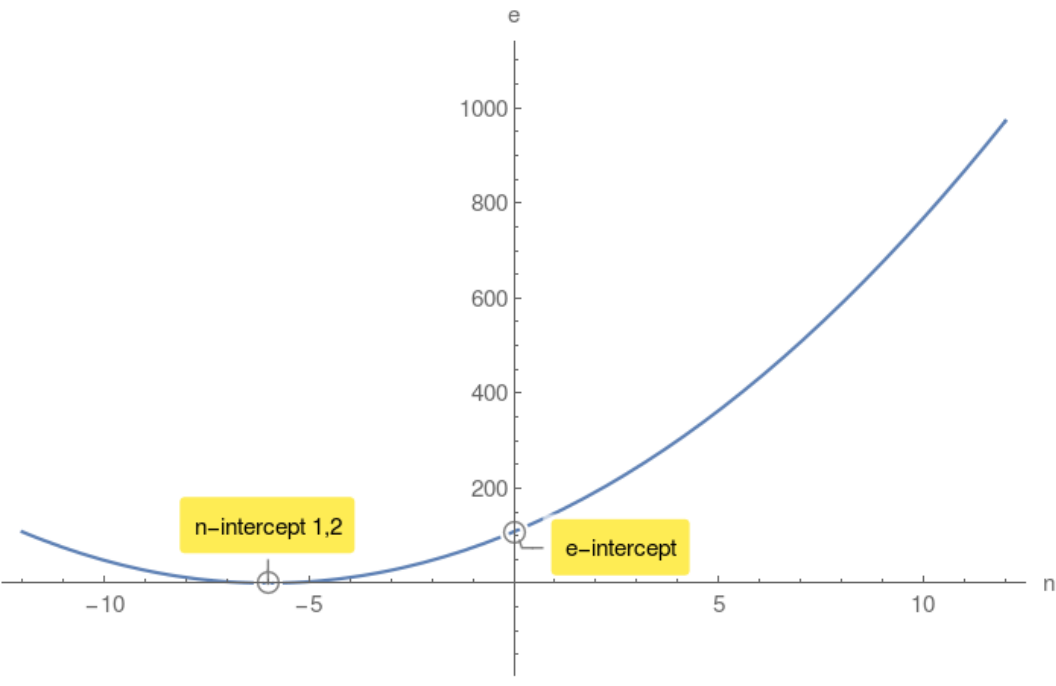
Example 2.

$e(n)=3\,n^2+36\,n+108$ compute its discriminant $\triangle$:

$\triangle=0$

$n_{1,2}=-6,-6$

$e(0)=108$ e-intercept.



Case3: $\triangle<0$

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

However there is a e-intercept.

Example 3.

$e(n)=-4\,n^2+64\,n-320$ compute its discriminant $\triangle$:

$\triangle=-1024<0$

$e(0)=-320$ e-intercept.