Intercepts of the Quadratic

Given a quadratic $g(n)=a\,n^2+b\,n+c$ 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.

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

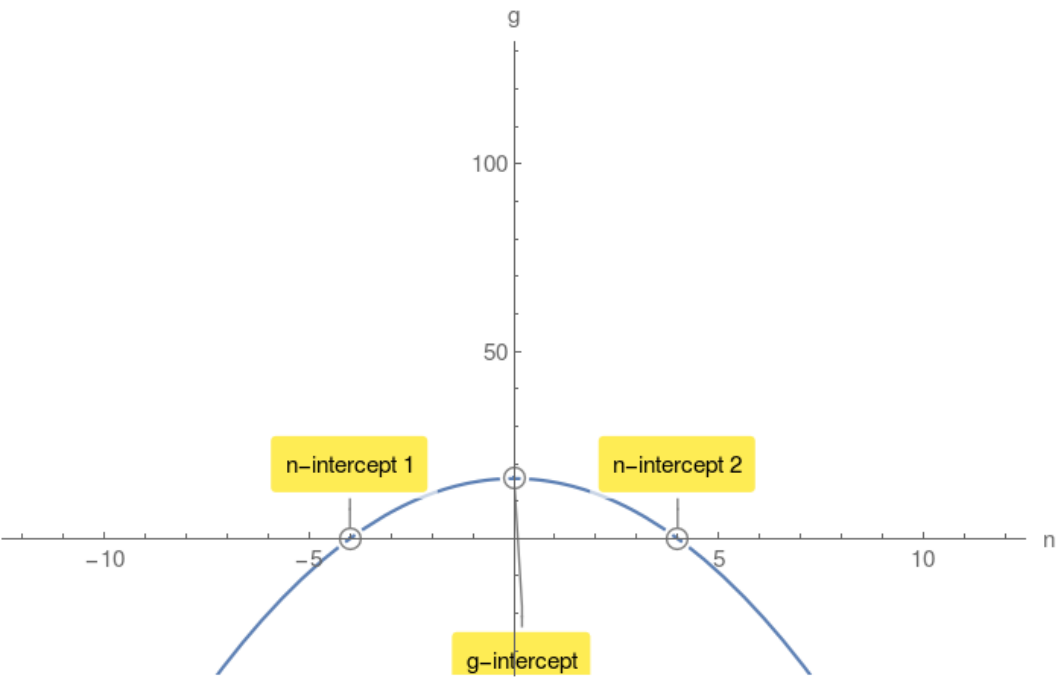
Example 1.

$g(n)=16-n^2$ compute its discriminant $\triangle$:

$\triangle=64>0$

$n_{1,2}=-4,4$

$g(0)=16$ g-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.

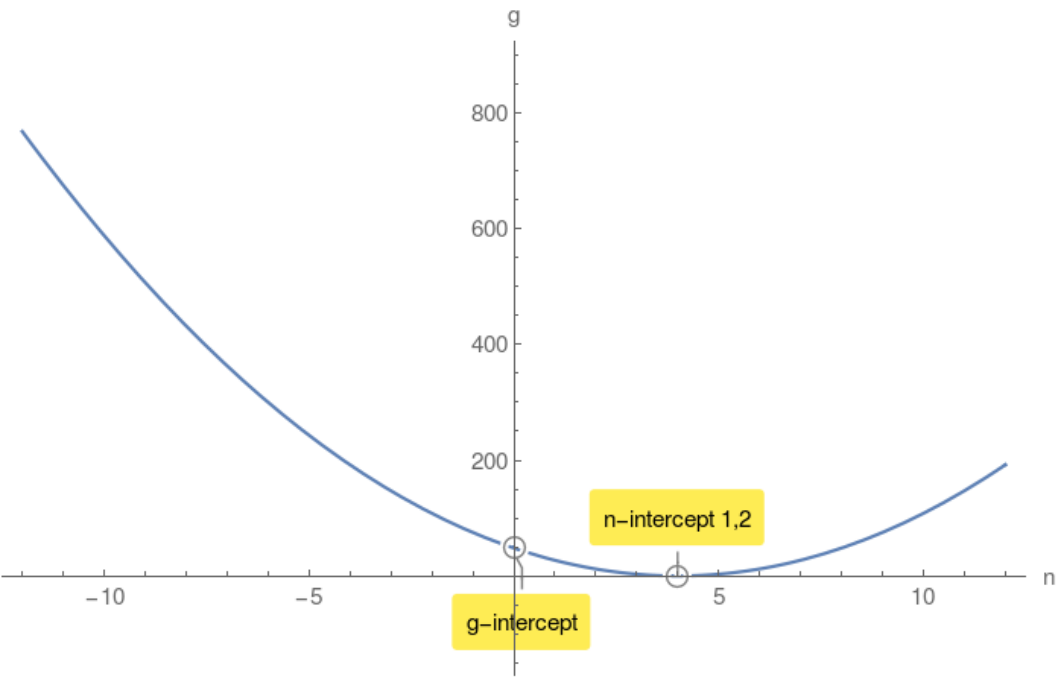
Example 2.

$g(n)=3\,n^2-24\,n+48$ compute its discriminant $\triangle$:

$\triangle=0$

$n_{1,2}=4,4$

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

Example 3.

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

$\triangle=-1600<0$

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