Intercepts of the Quadratic

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

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

Case1: $\triangle>0$

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

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

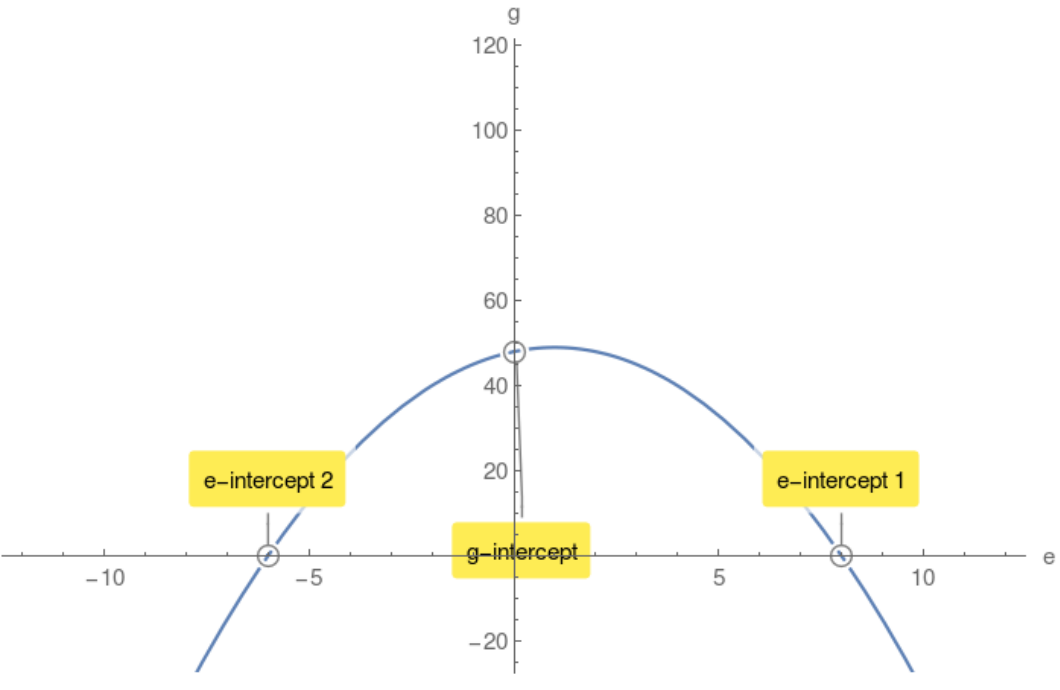
Example 1.

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

$\triangle=196>0$

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

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



Case2: $\triangle=0$

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

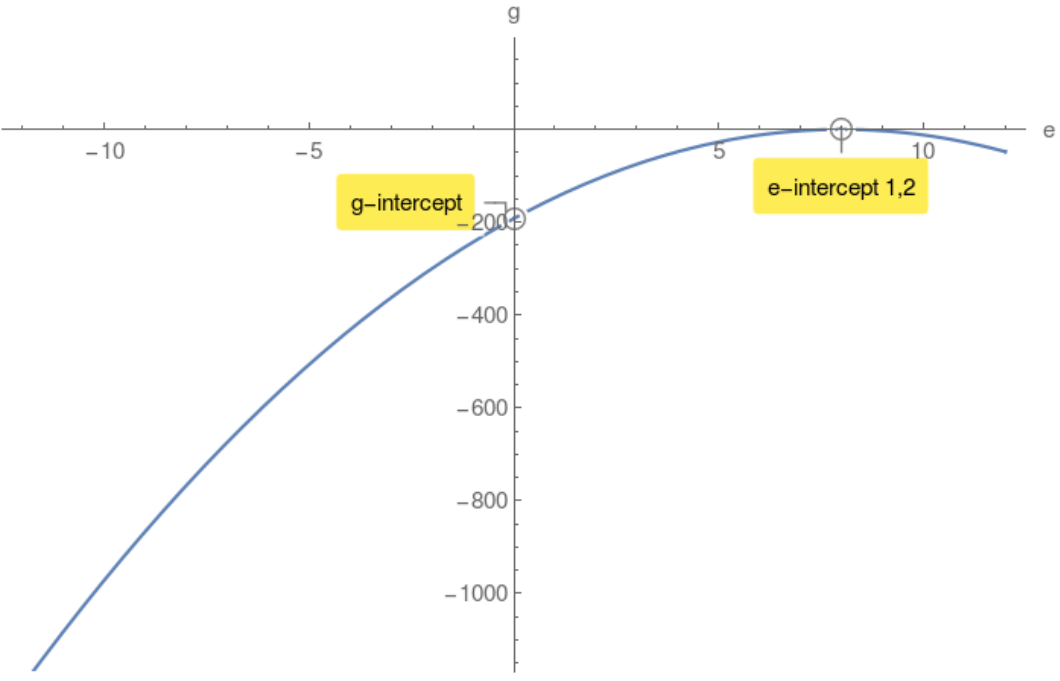
Example 2.

$g(e)=-3\,e^2+48\,e-192$ compute its discriminant $\triangle$:

$\triangle=0$

$e_{1,2}=8,8$

$g(0)=-192$ g-intercept.



Case3: $\triangle<0$

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

However there is a g-intercept.

Example 3.

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

$\triangle=-1600<0$

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