Intercepts of the Quadratic

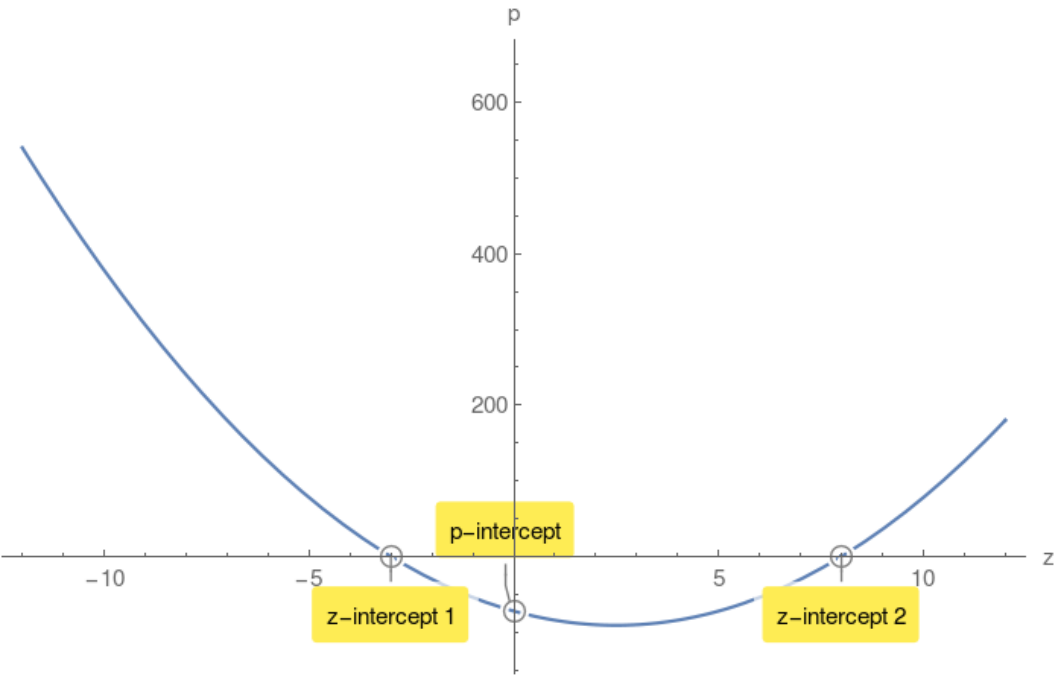
Given a quadratic $p(z)=a\,z^2+b\,z+c$ compute its discriminant $\triangle$:
$\triangle=\sqrt{b^2-4\,ac}$

Case1: $\triangle>0$

$z_{1,2}=\frac{-b\pm\sqrt{b^2-4\,ac}}{2a}$ computes the z-intercepts of multiplicity 1.
$p(0)=c$ computes the single p-intercept.

Example 1.

$p(z)=3\,z^2-15\,z-72$ compute its discriminant $\triangle$:
$\triangle=1089>0$
$z_{1,2}=-3,8$
$p(0)=-72$ p-intercept.

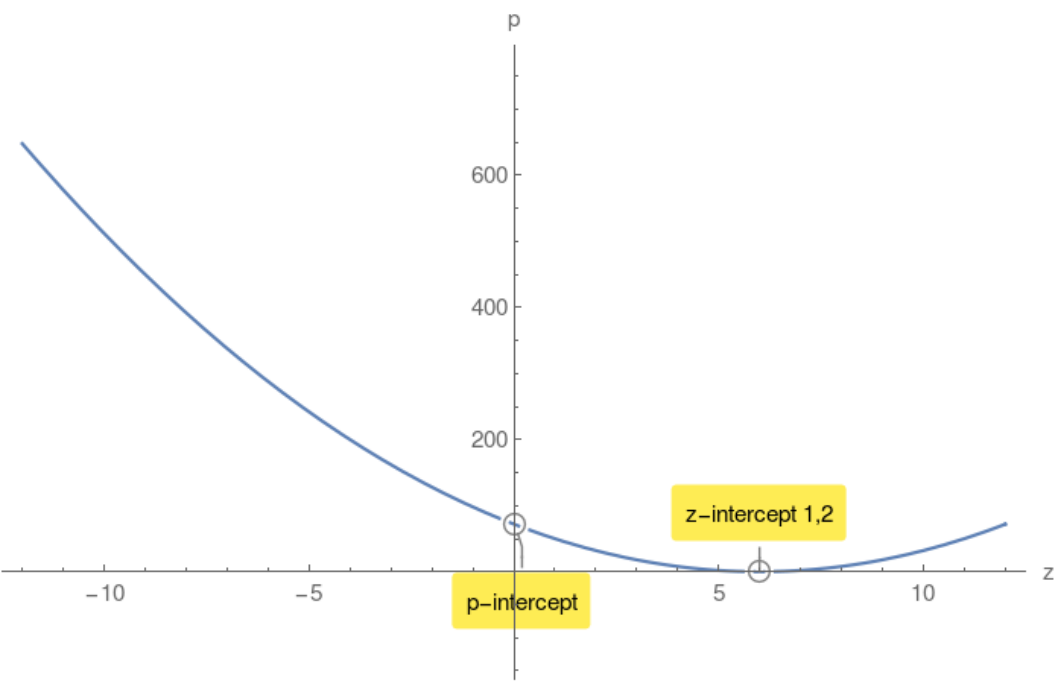


Case2: $\triangle=0$

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

Example 2.

$p(z)=2\,z^2-24\,z+72$ compute its discriminant $\triangle$:
$\triangle=0$
$z_{1,2}=6,6$
$p(0)=72$ p-intercept.



Case3: $\triangle<0$

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

Example 3.

$p(z)=-4\,z^2+72\,z-405$ compute its discriminant $\triangle$:
$\triangle=-1296<0$
$p(0)=-405$ p-intercept.