

Intercepts of the Quadratic

Given a quadratic $u(j) = a j^2 + b j + c$ compute its discriminant Δ :

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

Case1: $\Delta > 0$

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

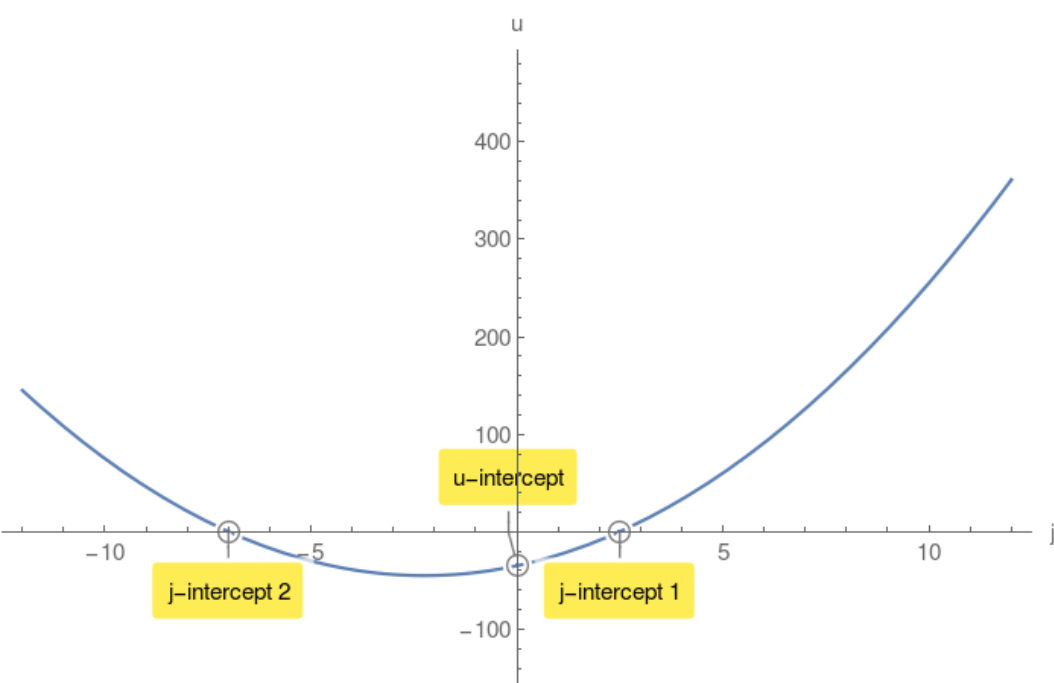
Example 1.

$u(j) = 2j^2 + 9j - 35$ compute its discriminant Δ :

$$\Delta = 361 > 0$$

$$j_{1,2} = \frac{5}{2}, -7$$

$u(0) = -35$ u -intercept.



Case2: $\Delta = 0$

$j_{1,2} = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} = \frac{-b \pm 0}{2a} = \frac{-b}{2a}$ single j -intercept of multiplicity 2.

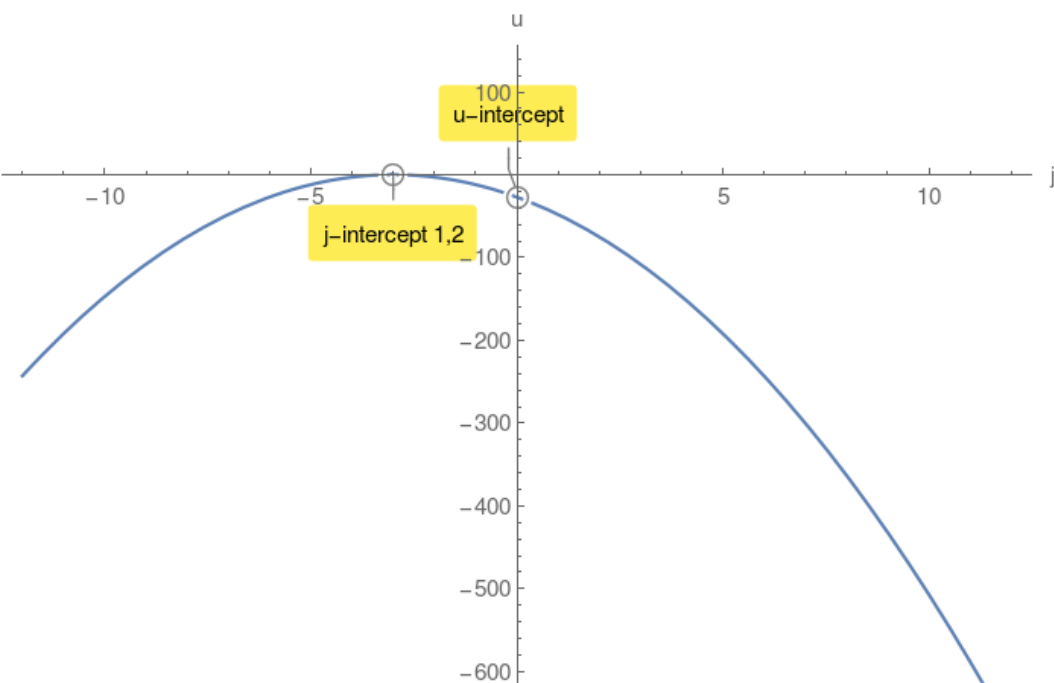
Example 2.

$u(j) = -3j^2 - 18j - 27$ compute its discriminant Δ :

$$\Delta = 0$$

$$j_{1,2} = -3, -3$$

$u(0) = -27$ u -intercept.



Case3: $\Delta < 0$

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

However there is a u -intercept.

Example 3.

$u(j) = -4j^2 - 56j - 245$ compute its discriminant Δ :

$$\Delta = -784 < 0$$

$u(0) = -245$ u -intercept.

