

Intercepts of the Quadratic

Given a quadratic $s(f) = af^2 + bf + c$ compute its discriminant Δ :

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

Case1: $\Delta > 0$

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

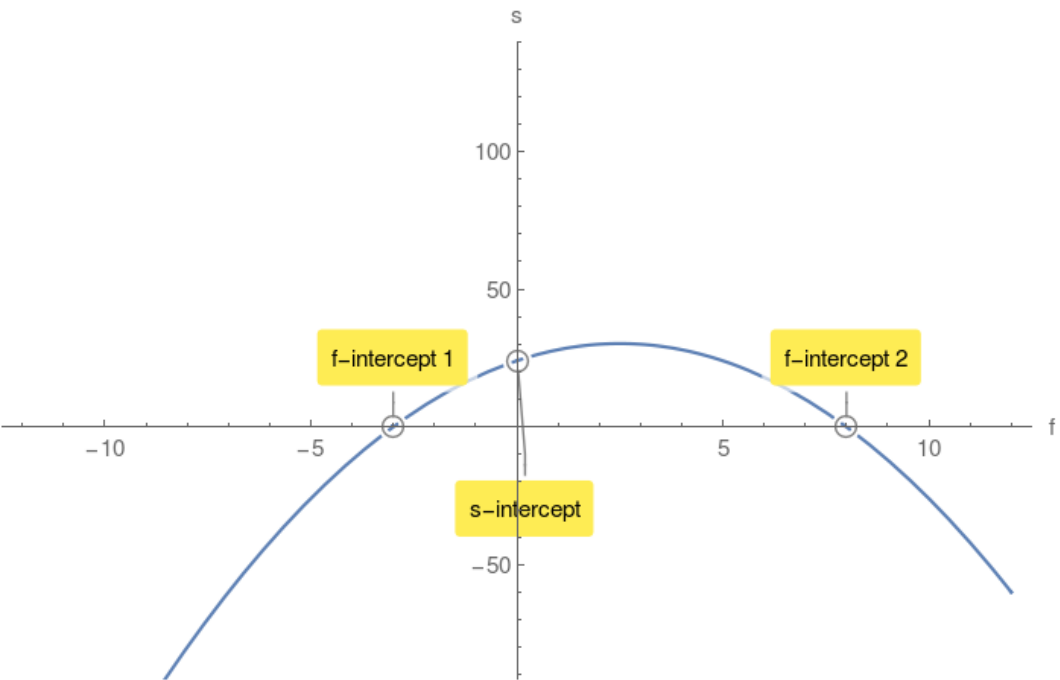
Example 1.

$s(f) = -f^2 + 5f + 24$ compute its discriminant Δ :

$$\Delta = 121 > 0$$

$$f_{1,2} = -3, 8$$

$s(0) = 24$ s-intercept.



Case2: $\Delta = 0$

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

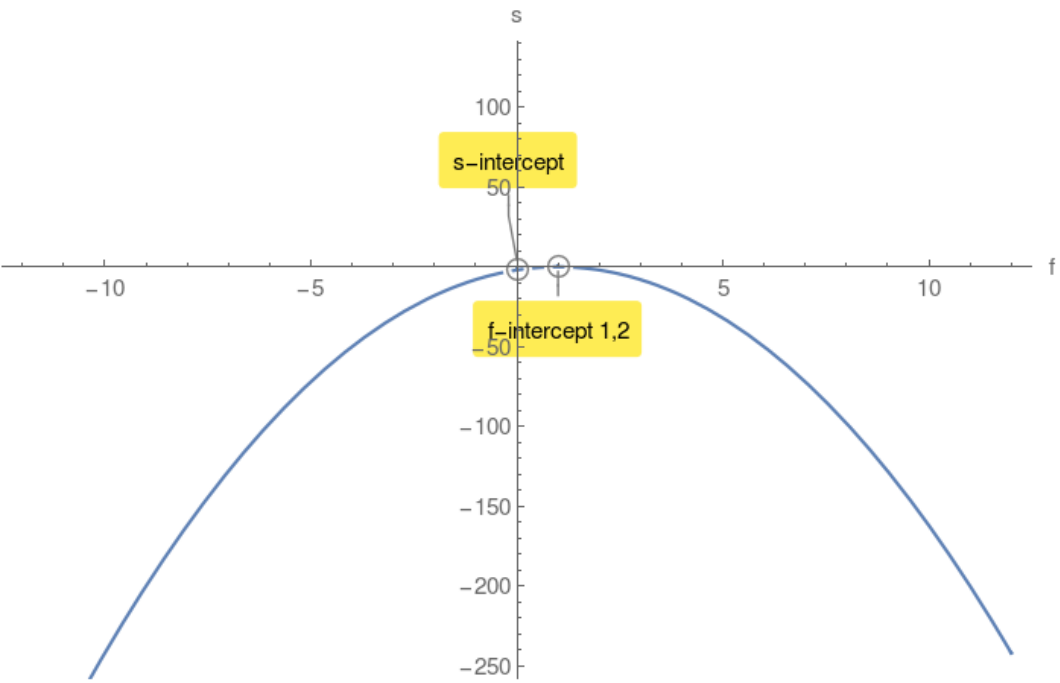
Example 2.

$s(f) = -2f^2 + 4f - 2$ compute its discriminant Δ :

$$\Delta = 0$$

$$f_{1,2} = 1, 1$$

$s(0) = -2$ s-intercept.



Case3: $\Delta < 0$

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

Example 3.

$s(f) = 9f^2 + 162f + 810$ compute its discriminant Δ :

$$\Delta = -2916 < 0$$

$s(0) = 810$ s-intercept.

