

Intercepts of the Quadratic

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

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

Case1: $\Delta > 0$

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

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

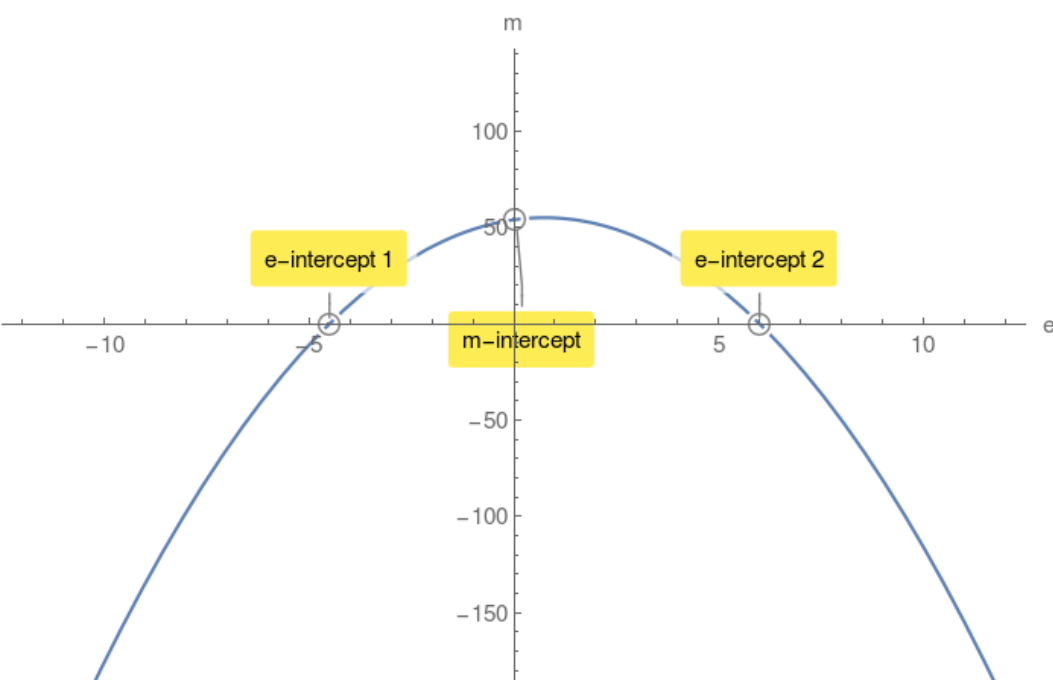
Example 1.

$m(e) = -2e^2 + 3e + 54$ compute its discriminant Δ :

$$\Delta = 441 > 0$$

$$e_{1,2} = -\frac{9}{2}, 6$$

$m(0) = 54$ m-intercept.



Case2: $\Delta = 0$

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

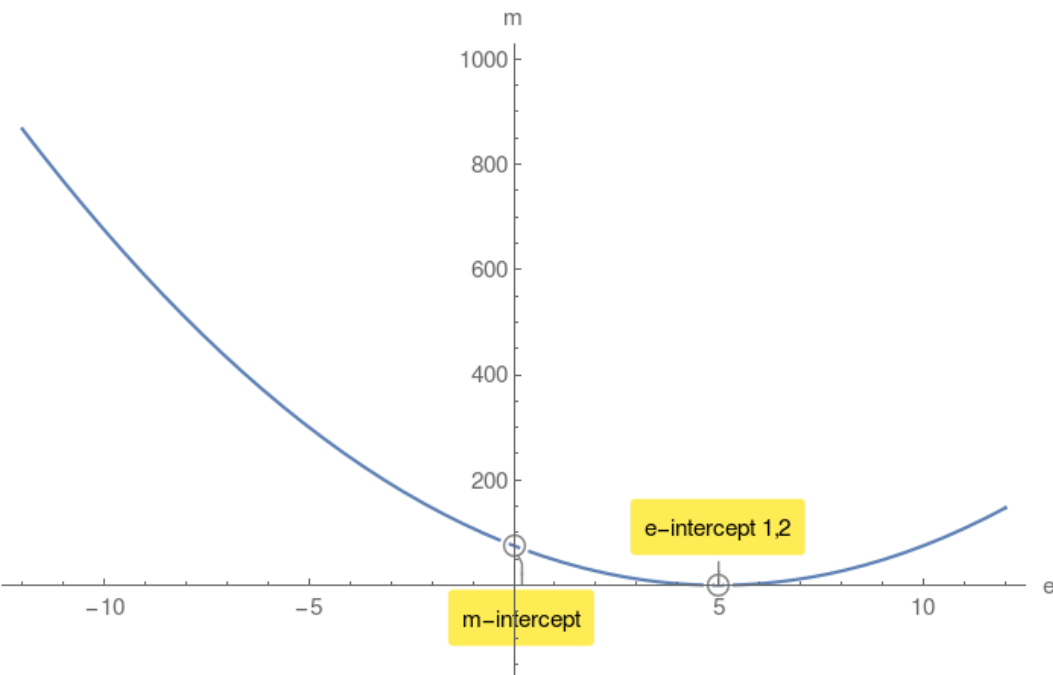
Example 2.

$m(e) = 3e^2 - 30e + 75$ compute its discriminant Δ :

$$\Delta = 0$$

$$e_{1,2} = 5, 5$$

$m(0) = 75$ m-intercept.



Case3: $\Delta < 0$

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

However there is a m-intercept.

Example 3.

$m(e) = -9e^2 - 180e - 1000$ compute its discriminant Δ :

$$\Delta = -3600 < 0$$

$m(0) = -1000$ m-intercept.

