Plotting the Parabola

How to plot : $q(z) = a z^2 + b z + c$
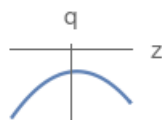
Step 1.

Examine the sign for the leading coefficent

If a > 0 then the valley shape:
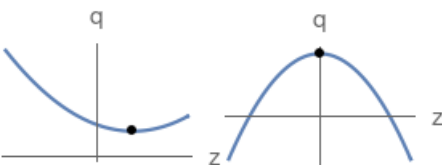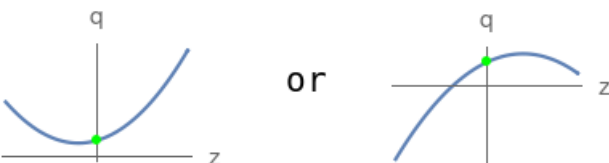
If a < 0 then the hill shape:

Step 2.

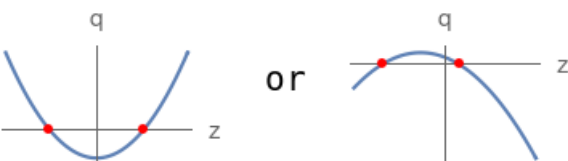Compute the vertex: $\left(-\dfrac{b}{2a}, q\left(-\dfrac{b}{2a}\right)\right)$

Step 3.

Compute the q-intercept by setting z=0, $0^2 a + 0 b + c = c$

or

Step 4.

Compute the z-intercepts by solving: $a z^2 + b z + c = 0$

or

Step 5.

Sketch a rough plot, try to connect vertex to intercepts:

or