Plotting the Parabola

How to plot : $x(z) = a\,z^2 + b\,z + c$

Step 1.

Examine the sign for the leading coeficent

If $a > 0$ then the valley shape:
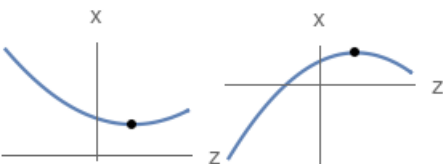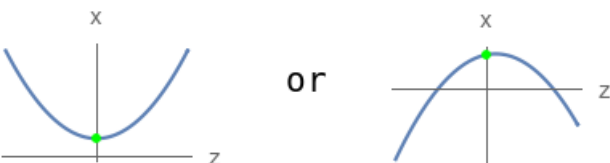

If $a < 0$ then the hill shape:

Step 2.

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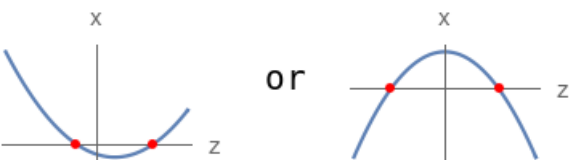

Step 3.

Compute the x-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