Plotting the Parabola

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

Step 1.

Examine the sign for the leading coefficent

If a $>$ 0 then the valley shape:
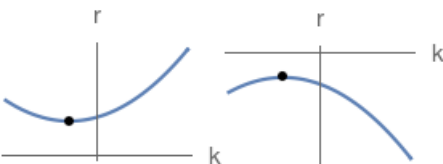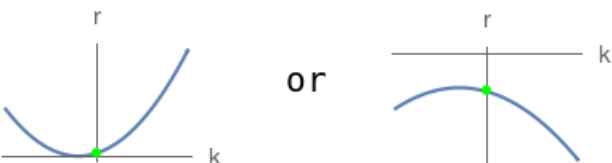

If a $<$ 0 then the hill shape:

Step 2.

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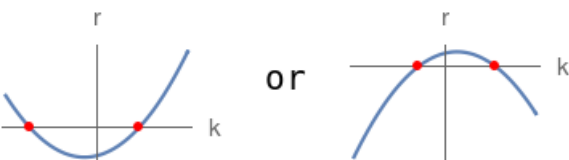

Step 3.

Compute the r–intercept by setting k=0, $0^2\,a + 0\,b + c = c$

 or

Step 4.

Compute the k–intercepts by solving: $a\,k^2 + b\,k + c = 0$

 or

Step 5.

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

 or