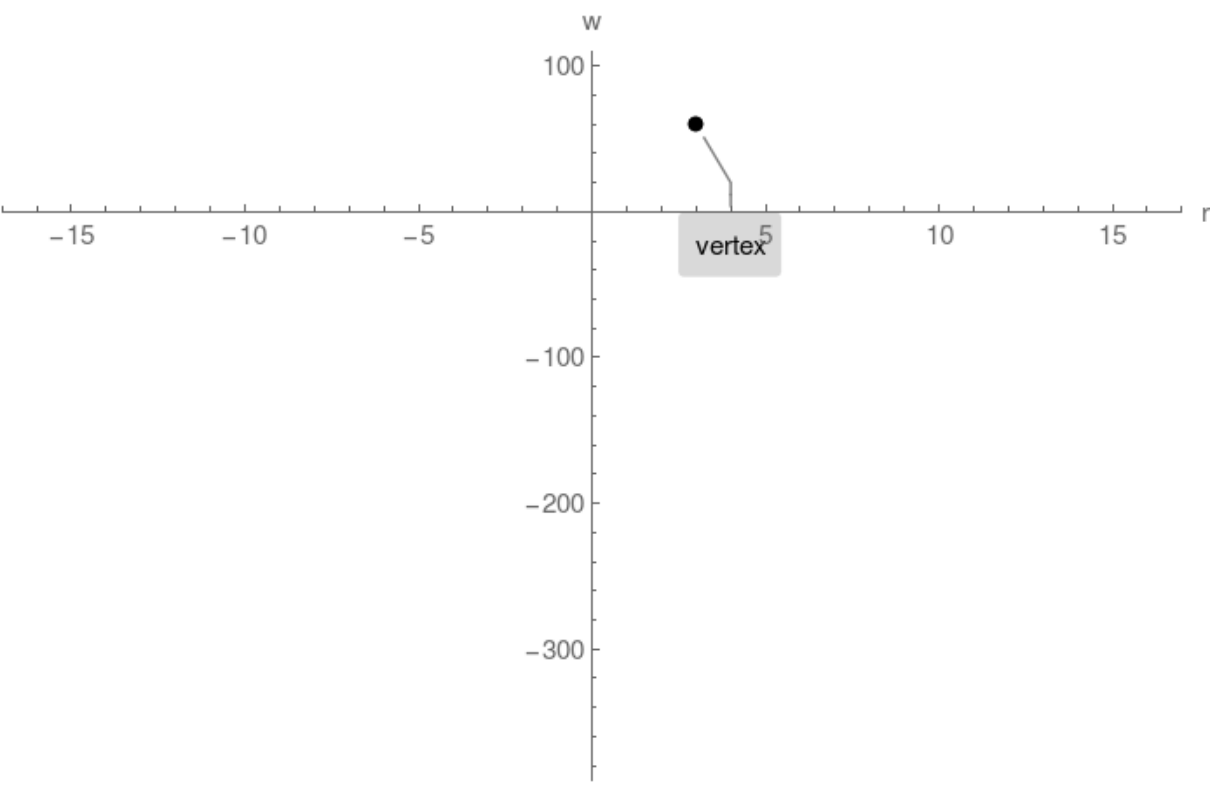
Example 1. 2 horizontal intercepts found

Plot $w(r) = -r^2 + 6r + 51$

Step 1.

Compute vertex and plot single point:

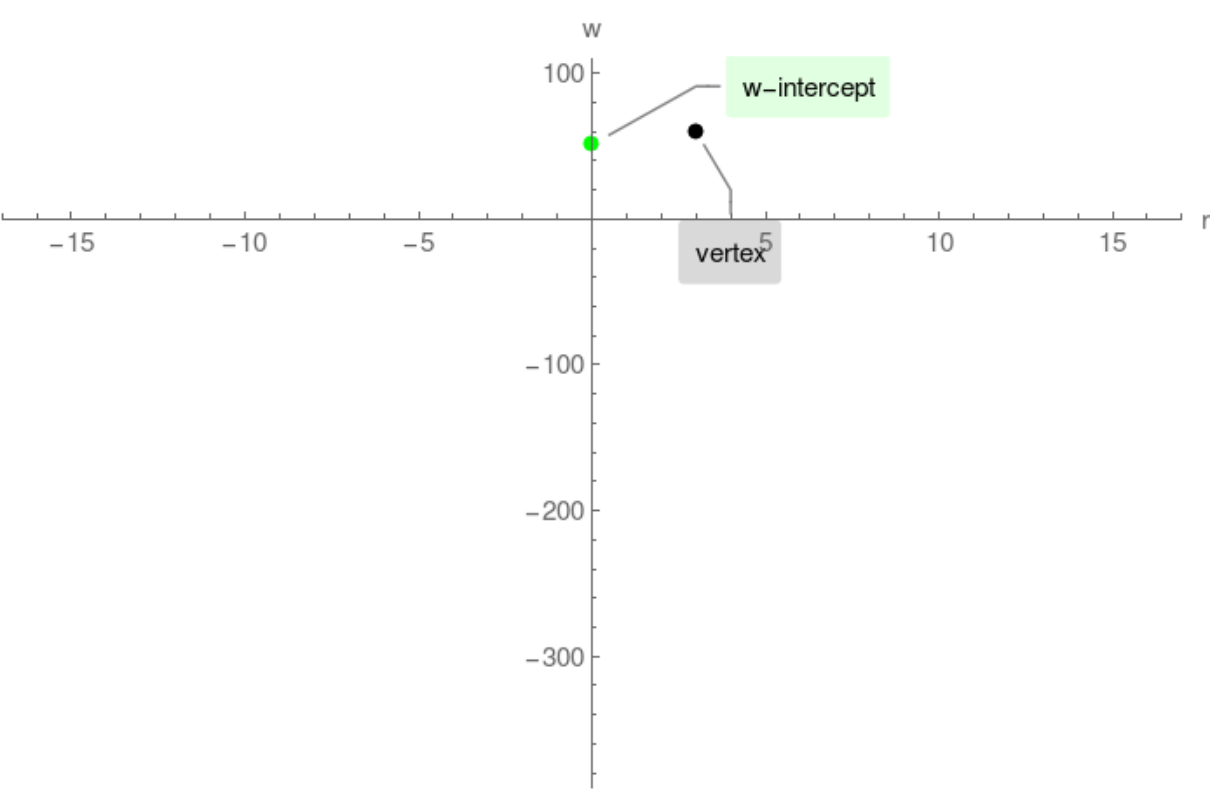
vertex$=(3,60)$



Step 2.

Compute w-intercept and plot single point:

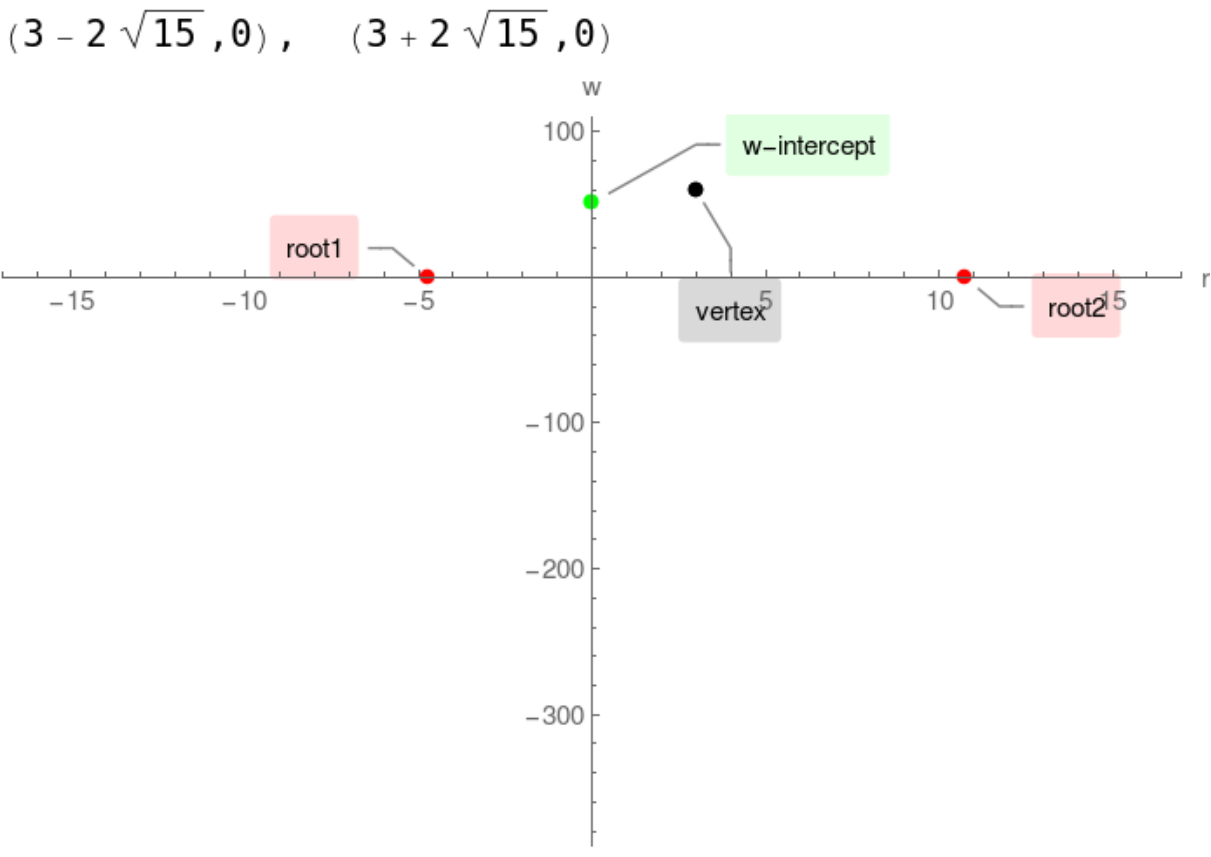
w-intercept$=(0,51)$



Step 3.

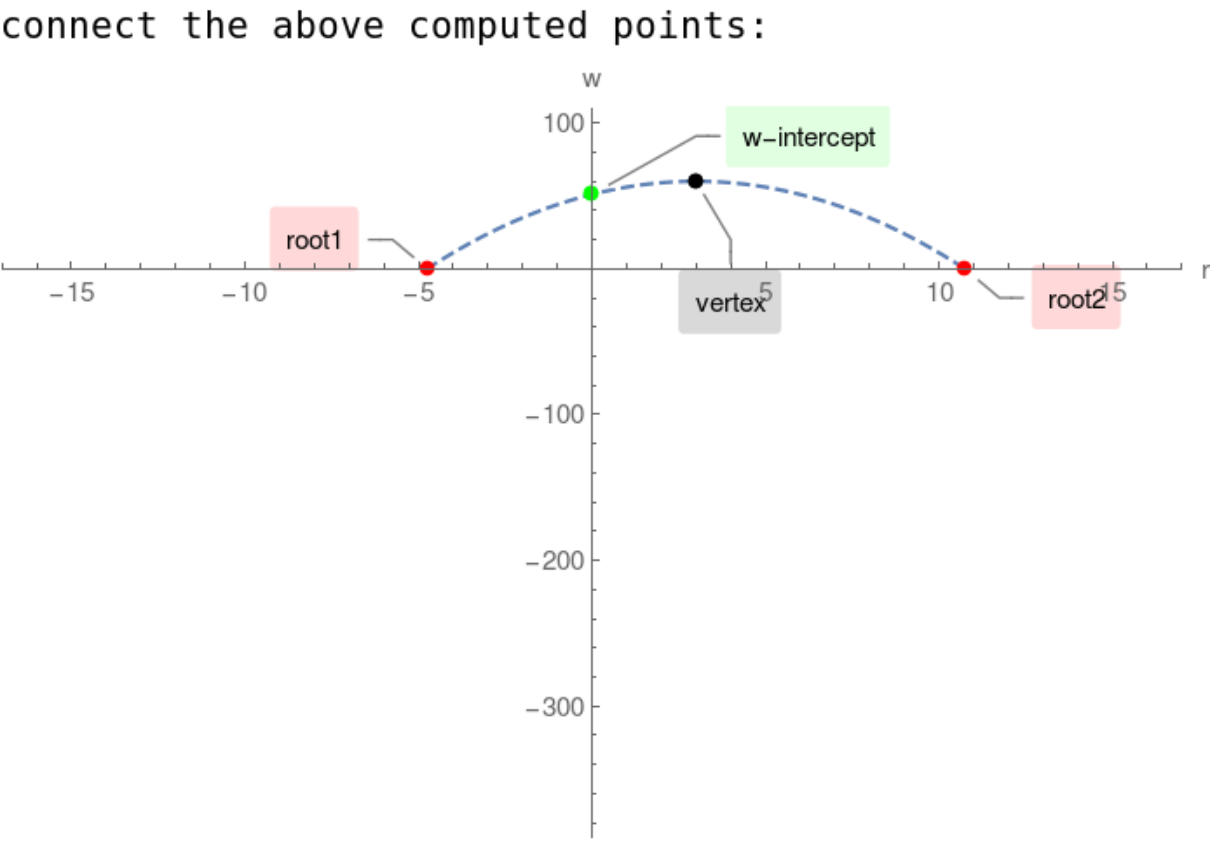
Compute r-intercepts by solving $-r^2 + 6r + 51 = 0$:

$(3 - 2\sqrt{15}, 0)$, $(3 + 2\sqrt{15}, 0)$



Step 4.

connect the above computed points:



Step 5.

Extend the parabola beyond the range of intercepts