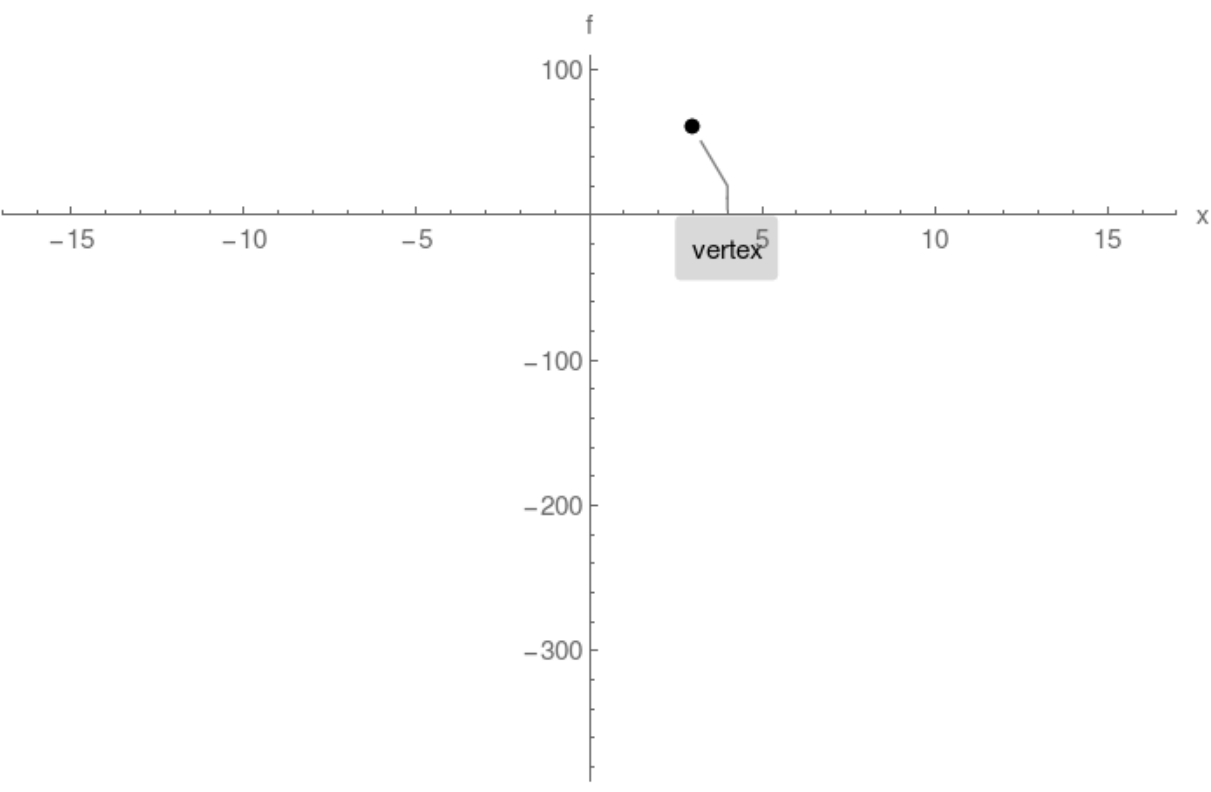
Example 1. 2 horizontal intercepts found

Plot $f(x) = -x^2 + 6x + 51$

Step 1.

Compute vertex and plot single point:

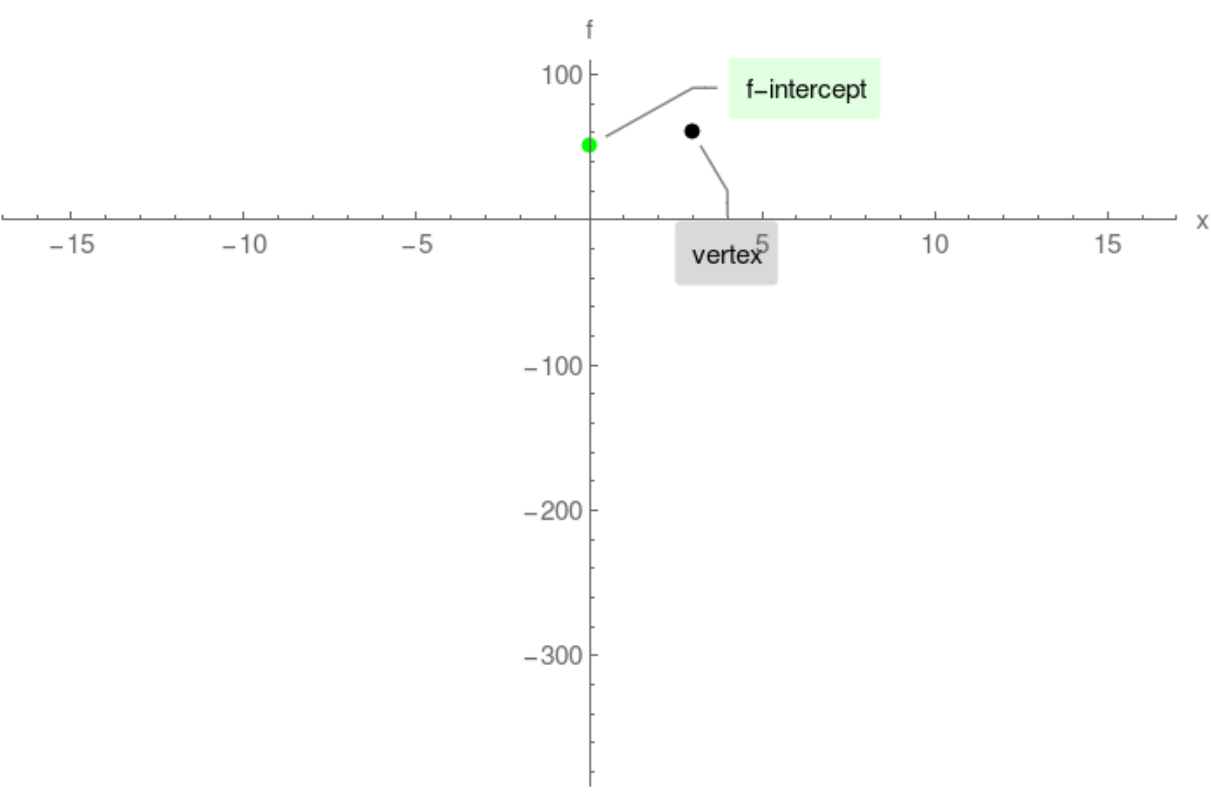
vertex$=(3,60)$



Step 2.

Compute f−intercept and plot single point:

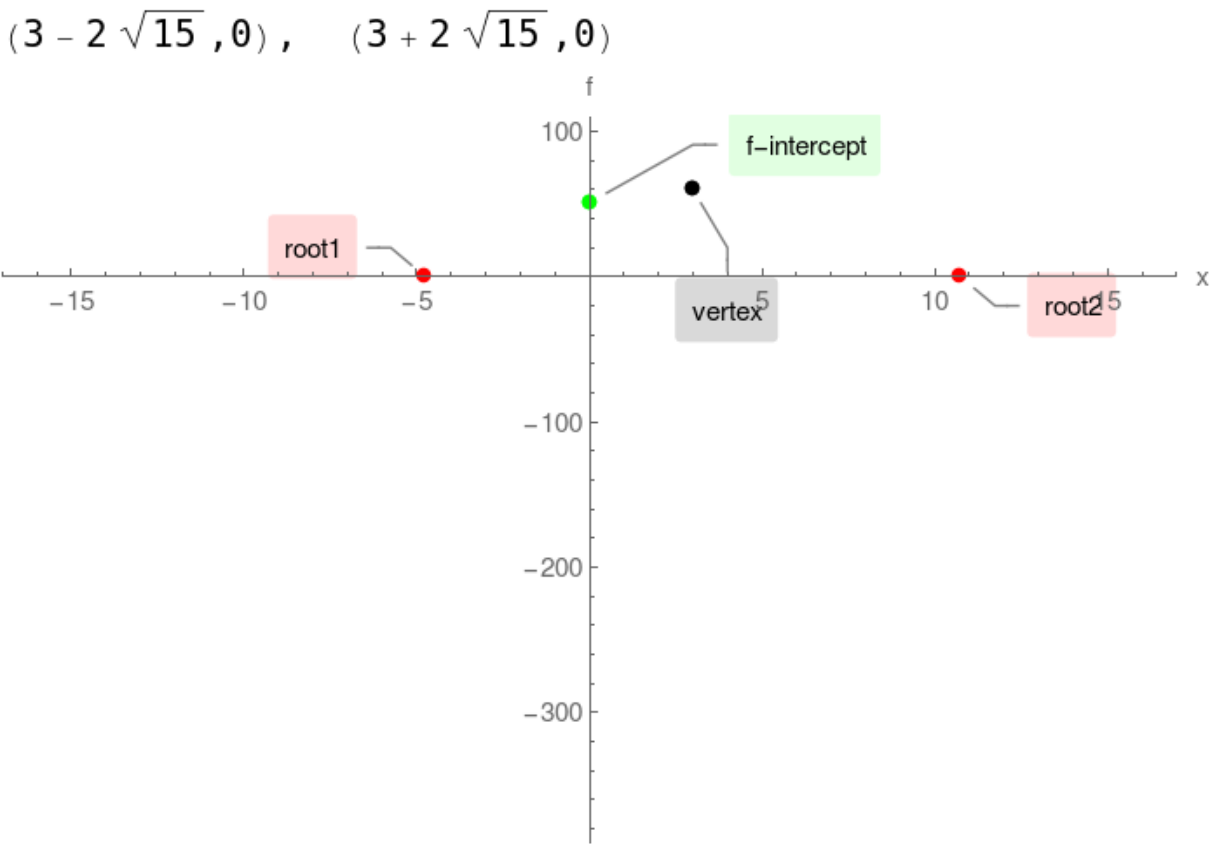
f−intercept$=(0,51)$



Step 3.

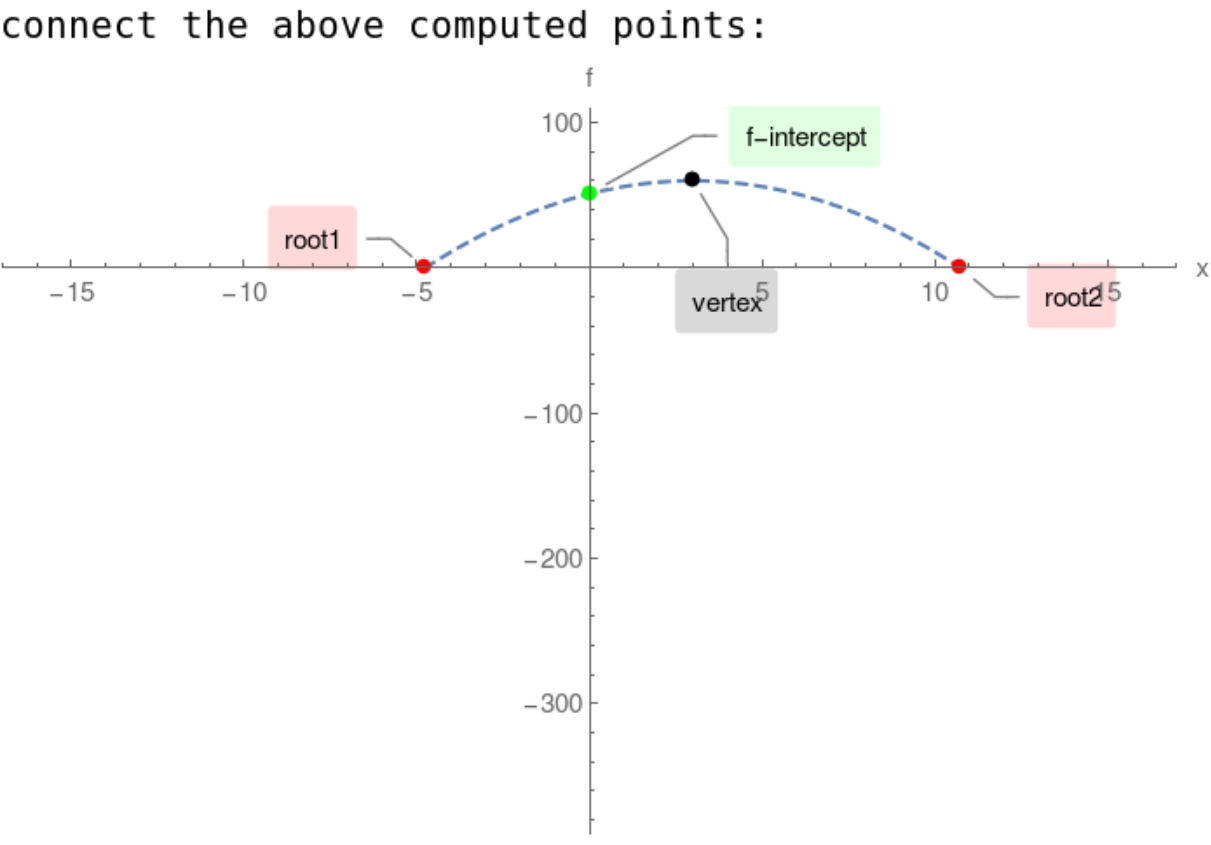
Compute x−intercepts by solving $-x^2 + 6x + 51 = 0$:

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



Step 4.

connect the above computed points:



Step 5.

Extend the parabola beyond the range of intercepts