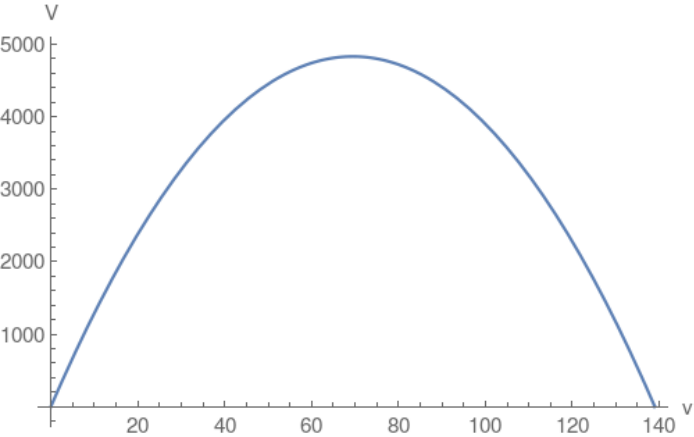
2.

2. Perimeter of rectangle $= 2(v+a) = 278$ where a is the length of the other edge of rectangle. Area of the rectangle is $= v \times a$.
Use perimeter equation
and solve for $a = \frac{278-2v}{2}$

Then reformulate the area $V = v \times a = 139\,v - v^2$ which turns out to be a quadratic Parabola:



Compute the vertex $\frac{278}{4}$ and then plug the vertex into the area which will compute the maximum area.