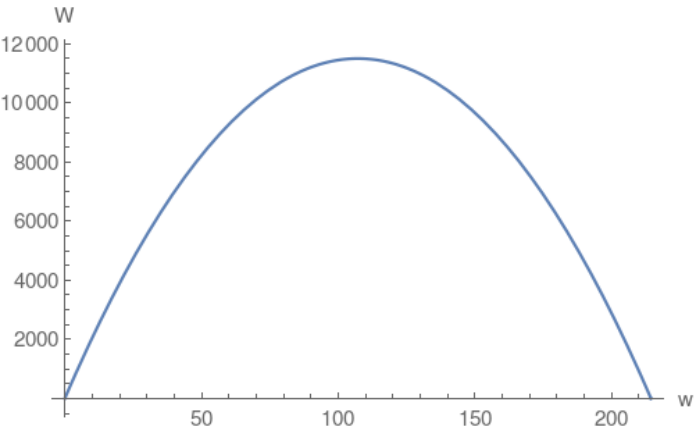
1.

1. Perimeter of rectangle $= 2(w+a) = 429$ where a is the length of the other edge of rectangle. Area of the rectangle is $= w \times a$.
Use perimeter equation
and solve for $a = \frac{429-2w}{2}$

Then reformulate the area $W = w \times a = \frac{429\,w}{2} - w^2$ which turns out to be a quadratic Parabola:



Compute the vertex $\frac{429}{4}$ and then plug the vertex into the area which will compute the maximum area.