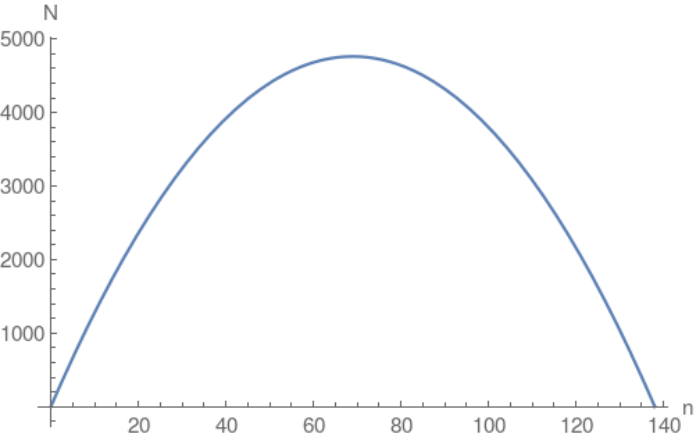
1.

1. Perimeter of rectangle = $2(n+a)=276$ where a is the length of the other edge of rectangle. Area of the rectangle is = $n \times a$.
Use perimeter equation
and solve for a= $\frac{276-2n}{2}$

Then reformulate the area N= $n \times a = 138\,n - n^2$ which turns out to be a quadratic Parabola:



Compute the vertex $\frac{276}{4}$ and then plug the vertex into the area which will compute the maximum area.