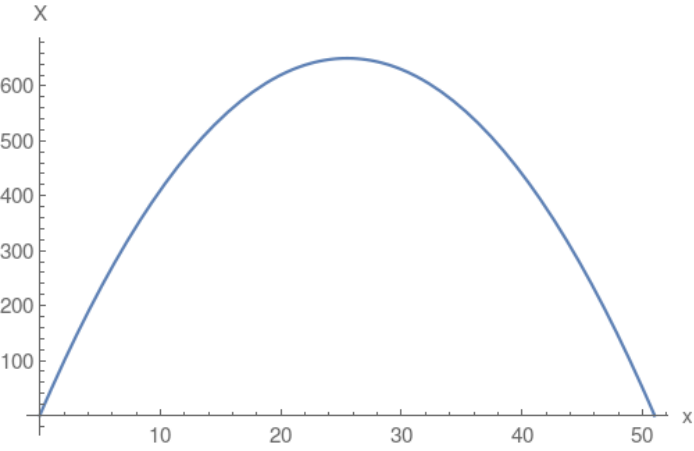
2.

2. Perimeter of rectangle $= 2(x+a) = 102$ where a is the length of the other edge of rectangle. Area of the rectangle is $= x \times a$.
Use perimeter equation
and solve for $a = \frac{102-2x}{2}$

Then reformulate the area $X = x \times a = 51x - x^2$ which turns out to be a quadratic Parabola:



Compute the vertex $\frac{102}{4}$ and then plug the vertex into the area which will compute the maximum area.