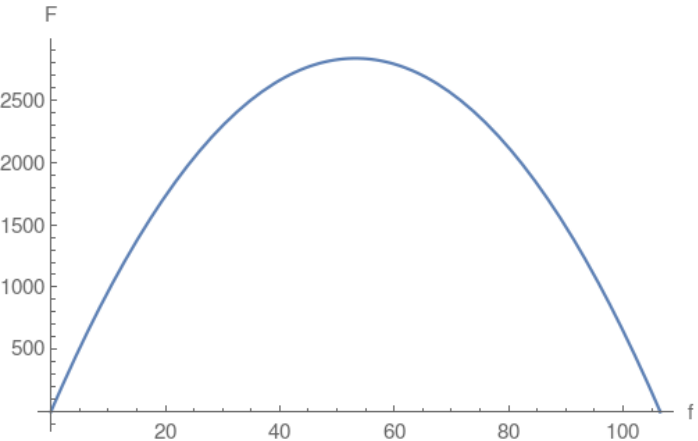
2.

2. Perimeter of rectangle $= 2(f+a) = 213$ where a is the length of the other edge of rectangle. Area of the rectangle is $= f \times a$.
Use perimeter equation
and solve for $a = \frac{213-2f}{2}$

Then reformulate the area $F = f \times a = \frac{213\,f}{2} - f^2$ which turns out to be a quadratic Parabola:



Compute the vertex $\frac{213}{4}$ and then plug the vertex into the area which will compute the maximum area.