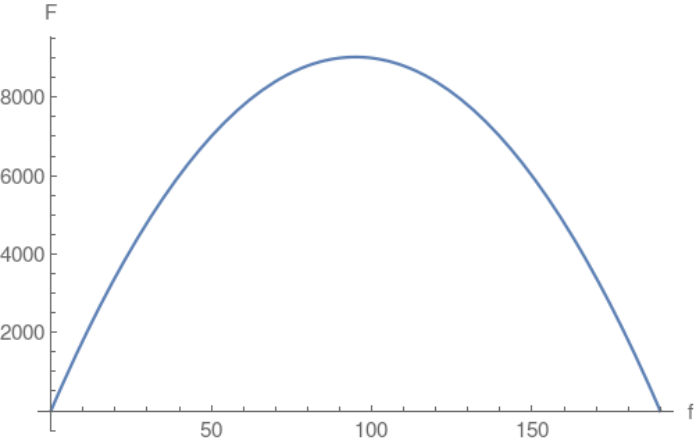
1.

1. Perimeter of rectangle = $2(f+a)=380$ 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= $\frac{380-2f}{2}$

Then reformulate the area F= $f \times a = 190\,f - f^2$ which turns out to be a quadratic Parabola:



Compute the vertex $\frac{380}{4}$ and then plug the vertex into the area which will compute the maximum area.