1.

1. Since the fences enclose a rectangular plot without one side, two sides have length b and one side has length a:

$a+b+b=3671 \implies a=3671-2b$

the area:

$\text{area}=a\times b=(l-2b)\,b=\ 3671\,b-2\,b^2$

Note that the function is for parabola. Now solve for the vertex:

$\text{vertex}=\ \left(\frac{3671}{4}\ \text{meters}\ ,\ \frac{13\,476\,241}{8}\ \text{meters}^2\ \right)$

Square the unit for vertex's vertical coordinate since it is a quadratic.