4.

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

$a+b+b=4972 \implies a=4972-2b$

the area:

$area=a \times b=(l-2b)b= 4972\,b - 2\,b^2$

Note that the equation is for parabola. Now find the vertex:

$vertex= (1243 \text{ meters} , 3090098 \text{ meters}^2)$

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