4.

4. There are 3 sides to fence, two sides with length b and one side with length a:

$a+b+b=2089 \implies a=2089-2b$

Now find the area:

$area=a \times b=(l-2b)b= 2089 b - 2 b^2$

Notice the Parabolic equation, find the vertex:

$vertex= (\frac{2089}{4}$ meters , $\frac{4\,363\,921}{8}$ meters^2)

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