2.

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

$a+b+b=3986 \implies a=3986-2b$

Now solve for the area:

$area=a \times b=(l-2b)b= 3986\ b-2\ b^2$

Notice the Parabolic formula, solve for the vertex:

$vertex= (\frac{1993}{2}\ yd\ ,\ \frac{3\,972\,049}{2}\ yd^2\ )$

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