4.

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

$a+b+b=1406 \implies a=1406-2b$

Now find the area:

$area=a\times b=(l-2b)b= 1406 b - 2 b^2$

Notice the Parabolic formula, find the vertex:

$vertex= (\frac{703}{2}$ yards $, \frac{494209}{2}$ yards$^2)$

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