4.

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

$a + b + b = 3641 \implies a = 3641 - 2b$

Now compute the area:

$area = a \times b = (l - 2b)b = 3641\,b - 2\,b^2$

Notice the Parabolic function, compute the vertex:

$vertex = (\frac{3641}{4}\ yd\ ,\ \frac{13\,256\,881}{8}\ yd^2\ )$

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