4.

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

$a+b+b=3621 \implies a=3621-2b$

the area:

$area=a\times b=(l-2b)\,b= 3621\,b - 2\,b^2$

Note that the formula is for parabola. Now compute the vertex:

$vertex= (\frac{3621}{4}$ feet , $\frac{13\,111\,641}{8}$ feet^2)

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