4.

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

$a+b+b=3569 \implies a=3569-2b$

the area:

$\text{area}=a\times b=(l-2b)\,b=\ 3569\,b-2\,b^2$

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

$\text{vertex}=\ \left(\frac{3569}{4}\ \text{ft}\ ,\ \frac{12\,737\,761}{8}\ \text{ft}^2\right)$

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