1.

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

$a+b+b=1458 \implies a=1458-2b$

the area:

$area=a\times b=(l-2b)b= 1458 b - 2 b^2$

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

$vertex= (\frac{729}{2}$ feet $, \frac{531441}{2}$ feet$^2)$

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